

PRODUCT CATALOGUE

WELDING CONSUMABLES

2023

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WELDING CONSUMABLES

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WELDING CONSUMABLES PRODUCT CATALOGUE

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TEST RESULTS

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Safety Data Sheets (SDS):

<https://www.lincolnelectric.com/en-GB/Safety-Document-Search/Safety-Data-Sheets>

Catalogues and Brochures

<https://www.lincolnelectric.com/en-GB/Support/Download-Brochures-and-Catalogues>

Consumable TÜV Certificates:

<https://www.lincolnelectric.com/en-GB/Certificate-Center/TUV-Certificates>

STICK ELECTRODES FOR MILD STEEL

| Product name | Chemical composition (typical values) in % | | | | | | AWS | EN/ISO |
|------------------|--|------|------|---------|---------|--|----------|----------------|
| | C | Mn | Si | S | P | | | |
| BASIC 7018 | 0.08 | 1.1 | 0.45 | ≤ 0.015 | ≤ 0.025 | | AWS A5.1 | EN ISO 2560-A |
| BASIC 7018P | 0.06 | 1.5 | 0.3 | ≤ 0.025 | ≤ 0.025 | | AWS A5.1 | EN ISO 2560-A |
| Baso® 100 | 0.06 | 1.2 | 0.5 | ≤ 0.02 | ≤ 0.02 | | AWS A5.1 | EN ISO 2560-A |
| Baso® 120 | 0.06 | 1.4 | 0.3 | 0.010 | 0.015 | | AWS A5.1 | EN ISO 2560-A |
| Baso® 48SP | 0.06 | 0.9 | 0.7 | ≤ 0.015 | ≤ 0.020 | | AWS A5.1 | EN ISO 2560-A |
| Baso® G | 0.07 | 1.2 | 0.4 | ≤ 0.010 | ≤ 0.020 | | AWS A5.1 | EN ISO 2560-A |
| Conarc® 48 | 0.06 | 1.4 | 0.3 | 0.010 | 0.015 | | AWS A5.1 | EN ISO 2590-A |
| Conarc® 49 | 0.09 | 1.1 | 0.6 | 0.010 | 0.015 | | AWS A5.1 | EN ISO 2560-A |
| Conarc® 49C | 0.06 | 1.4 | 0.3 | 0.010 | 0.015 | | AWS A5.1 | EN ISO 2560-A |
| Conarc® 50 | 0.07 | 1.2 | 0.4 | ≤ 0.010 | ≤ 0.020 | | AWS A5.1 | EN ISO 2560-A |
| Conarc® 51 | 0.06 | 1.2 | 0.5 | ≤ 0.02 | ≤ 0.02 | | AWS A5.1 | EN ISO 2560-A |
| Conarc® L150 | 0.1 | 1.1 | 0.6 | ≤ 0.015 | ≤ 0.025 | | AWS A5.1 | EN ISO 2560-A |
| Conarc® ONE | 0.05 | 1.3 | 0.4 | 0.010 | 0.015 | | AWS A5.1 | EN ISO 2560-A |
| CUMULO | 0.08 | 0.6 | 0.4 | - | - | | AWS A5.1 | E 38 0 R 12 |
| Ferrod® T35T | 0.08 | 0.5 | 0.35 | - | - | | AWS A5.1 | E 38 0 RR 53 |
| Ferrod® 160T | 0.1 | 0.9 | 0.45 | - | - | | AWS A5.1 | E 42 0 RR 73 |
| Ferrod® 165A | 0.07 | 0.95 | 0.3 | - | - | | AWS A5.1 | E 42 2 RA 73 |
| Fleetweld® 5P+ | 0.20 | 0.56 | 0.17 | - | - | | AWS A5.1 | - |
| HYROD 7018 | 0.09 | 1.1 | 0.6 | 0.010 | 0.015 | | AWS | EN ISO 2560-A |
| HYROD 7018LT | 0.06 | 1.4 | 0.3 | 0.010 | 0.015 | | AWS | EN ISO 2560-A |
| HYROD 7028 | 0.1 | 1.1 | 0.6 | ≤ 0.015 | ≤ 0.025 | | AWS | EN ISO 2560-A |
| KARDO | 0.03 | 0.4 | 0.25 | 0.010 | 0.015 | | AWS A5.1 | E 35 2 B 32 H5 |
| Lincoln® 6010 | 0.1 | 0.6 | 0.2 | - | - | | AWS A5.1 | E 38 3 C 21 |
| Lincoln® 7016 DR | 0.08 | 1.2 | 0.6 | - | - | | AWS A5.1 | EN ISO 2560-A |
| LINCOLN 7018-1 | 0.06 | 1.3 | 0.30 | 0.025 | 0.025 | | AWS A5.1 | EN ISO 2560-A |
| NUMAL | 0.06 | 0.5 | 0.5 | - | - | | AWS A5.1 | E 38 0 R 11 |
| Omnia® | 0.08 | 0.5 | 0.3 | ≤ 0.03 | ≤ 0.03 | | AWS A5.1 | E 38 0 RC 11 |
| Omnia® 46 | 0.06 | 0.5 | 0.45 | - | - | | AWS A5.1 | E 42 0 R 11 |
| Pantafix | 0.08 | 0.5 | 0.3 | ≤ 0.03 | ≤ 0.03 | | AWS A5.1 | E 38 0 RC 11 |
| Pipeliner® 16P | 0.06 | 1.3 | 0.5 | 0.009 | 0.013 | | AWS A5.1 | - |
| Supra® | 0.12 | 0.5 | 0.6 | - | - | | AWS A5.1 | EN ISO 2560-A |
| Universalis® | 0.08 | 0.6 | 0.45 | - | - | | AWS A5.1 | E 42 0 RR 12 |
| VANDAL | 0.08 | 1.2 | 0.4 | ≤ 0.015 | ≤ 0.020 | | AWS A5.1 | EN ISO 2560-A |

* Nearest classification

STICK ELECTRODES FOR LOW ALLOY STEEL

| Product | Chemical composition (typical values) in % | | | | | | | | | | | AWS | EN/ISO | | | | |
|------------------|--|-----------|-----------|--------|-------|-----------|----------|-----------|------|-----------|---|-----|--------|----------|------------------------|----------------|----------------------|
| | C | Mn | Si | S | P | Ni | Cr | Mo | Cu | V | | | | | | | |
| Conarc® 55CT | 0.06 | 1.3 | 0.4 | ≤0.02 | ≤0.02 | 0.45 | 0.5 | - | 0.45 | - | - | - | - | AWS A5.5 | E 8018-G H4R | EN ISO 2590-A | E 50.4 Z B 32 H5 |
| Conarc® 60G | 0.06 | 1.0 | 0.4 | 0.010 | 0.015 | 1.6 | - | 0.3 | - | - | - | - | - | AWS A5.5 | E 9018M-H4 | EN ISO 18275-A | E 55.4 Z B 32 H5 |
| Conarc® 70G | 0.06 | 1.2 | 0.4 | 0.009 | 0.014 | 1.0 | - | 0.4 | - | - | - | - | - | AWS A5.5 | E 9018-G-H4 | EN ISO 18275-A | E 55.4 1NiMo B 32 H5 |
| Kryo® 1 | 0.05 | 1.5 | 0.4 | 0.010 | 0.010 | 0.9 | - | - | - | - | - | - | - | AWS A5.5 | E 7018-G-H4R | EN ISO 2560-A | E 50.6 Mn1Ni B 32 H5 |
| Kryo® 1-180 | 0.07 | 1.2 | 0.3 | 0.0010 | 0.02 | 0.9 | - | - | - | - | - | - | - | - | - | EN ISO 2560-A | E 50.5 1Ni1B 73 H5 |
| Kryo® 1P | 0.05 | 1.5 | 0.5 | 0.005 | 0.010 | 0.95 | - | - | - | - | - | - | - | AWS A5.5 | E 8018-G-H4R | EN ISO 2560-A | E 50.6 Mn1Ni B 32 H5 |
| Kryo® 1R | 0.07 | 1.15 | 0.4 | 0.005 | 0.015 | 0.9 | - | - | - | - | - | - | - | AWS A5.5 | E 8018-C3-H4R | EN ISO 2560-A | E 46.6 1Ni1B 32 H5 |
| Kryo® 2 | 0.05 | 1.6 | 0.3 | 0.01 | 0.015 | 1.5 | - | - | - | - | - | - | - | AWS A5.5 | E 9018-G-H4R | EN ISO 2560-A | E 55.6 Z B 32 H5 |
| Kryo® 3 | 0.05 | 0.7 | 0.3 | 0.01 | 0.015 | 2.5 | - | - | - | - | - | - | - | AWS A5.5 | E 8018-C1-H4 | EN ISO 2560-A | E 50.6 Mn1Ni B 32 H5 |
| Kryo® 4 | 0.03 | 0.6 | 0.4 | 0.005 | 0.01 | 3.6 | - | - | - | - | - | - | - | AWS A5.5 | E 7016-C2L H4 | EN ISO 2560-A | E 42.6 3Ni1B 12 H5 |
| LINCOLN® 7010 | 0.1 | 0.7 | 0.2 | - | - | - | - | - | 0.5 | - | - | - | - | AWS A5.5 | E 7010-P1 | EN ISO 2560-A | E 42.3 Mo C 21 |
| LINCOLN® 8010 | 0.1 | 0.8 | 0.2 | - | - | 0.7 | - | 0.3 | - | - | - | - | - | AWS A5.1 | E 8010-G | EN ISO 2560-A | E 46.3 1NiMo C 21 |
| Pipeline® 7P+ | 0.15 | 0.6 | 0.1 | 0.015 | 0.015 | 0.85 | - | 0.1 | - | - | - | - | - | AWS A5.1 | E 7010-P1, E 7010-G | - | - |
| Pipeline® 8P+ | 0.17 | 0.7 | 0.25 | 0.01 | 0.01 | 0.8 | - | 0.2 | - | - | - | - | - | AWS A5.5 | E 8010-G, E 8010-P1 | - | - |
| Shield-Arc® 70+ | 0.13-0.17 | 0.6-1.2 | 0.05-0.3 | - | - | 0.75-0.97 | 0.01-0.2 | 0.05-0.15 | - | 0.02-0.04 | - | - | - | AWS A5.5 | E 8010-P1, E 8010-G | - | - |
| Shield-Arc® HYP+ | 0.13-0.17 | 0.49-0.63 | 0.08-0.18 | - | - | - | - | 0.27-0.31 | - | <0.01 | - | - | - | AWS A5.5 | E 7010-P1, E 7010-G | - | - |
| SL® 12G | 0.05 | 0.8 | 0.6 | 0.010 | 0.020 | - | - | 0.55 | - | - | - | - | - | AWS A5.5 | E 7018-A1-H4R | EN ISO 3580-A | EMo B 32 H5 |
| SL® 22G | 0.06 | 0.8 | 0.6 | 0.010 | 0.020 | - | 0.5 | 0.5 | - | - | - | - | - | AWS A5.5 | E 8018-B1-H4 | EN ISO 3580-A | EZ B 32 H5 |

* Nearest classification

STICK ELECTRODES FOR STAINLESS STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | | | | AWS | EN/ISO |
|-------------------|--|------|------|--------|--------|------|------|------|----------|----------|---------------|-----------------|
| | C | Mn | Si | S | P | Ni | Cr | Mo | | | | |
| Arosta® 304L | 0.02 | 0.8 | 0.8 | - | - | 9.7 | 19.5 | - | AWS A5.4 | E308L-16 | EN ISO 3581-A | E 19 19 LR 12 |
| Arosta® 307 | 0.09 | 5.0 | 0.6 | - | - | 8.5 | 18.5 | - | AWS A5.4 | E307-16 | EN ISO 3581-A | E 18 Mn R 12 |
| Arosta® 309S | 0.02 | 0.8 | 0.8 | - | - | 12.5 | 23.5 | - | AWS A5.4 | E309L-16 | EN ISO 3581-A | E 23 12 LR 32 |
| Arosta® 316L | 0.02 | 0.8 | 0.8 | - | - | 11.5 | 18.0 | 2.85 | AWS A5.4 | E316L-16 | EN ISO 3581-A | E 19 12 3 LR 12 |
| Clearosta® E 304L | 0.03 | 0.8 | 1.00 | 0.01 | 0.025 | 10.0 | 19.5 | - | AWS A5.4 | E308L-17 | EN ISO 3581-A | E 19 19 LR 32 |
| Clearosta® E 309L | 0.03 | 0.9 | 1.00 | 0.01 | 0.025 | 13.0 | 24.0 | - | AWS A5.4 | E309L-17 | EN ISO 3581-A | E 23 12 LR 22 |
| Clearosta® E 316L | 0.03 | 0.8 | 1.00 | 0.01 | 0.025 | 10.0 | 19.5 | 2.7 | AWS A5.4 | E316L-17 | EN ISO 3581-A | E 19 12 3 LR 22 |
| Limarosta® 304L | 0.025 | 0.75 | 0.95 | - | - | 9.7 | 19.0 | - | AWS A5.4 | E308L-17 | EN ISO 3581-A | E 19 19 LR 12 |
| Limarosta® 309S | 0.02 | 0.8 | 1.0 | - | - | 12.5 | 23.0 | - | AWS A5.4 | E308L-17 | EN ISO 3581-A | E 23 12 LR 32 |
| Limarosta® 316L | 0.02 | 0.8 | 1.0 | - | - | 11.5 | 18.0 | 2.8 | AWS A5.4 | E316L-17 | EN ISO 3581-A | E 19 12 3 LR 12 |
| LINOX 308L | 0.025 | 0.9 | 0.8 | ≤0.025 | ≤0.030 | 9.5 | 19.8 | - | AWS A5.4 | E308L-17 | EN ISO 3581-A | E 19 19 LR 32 |
| LINOX 309L | ≤0.040 | 0.9 | 0.9 | ≤0.025 | ≤0.025 | 12.2 | 23.5 | - | AWS A5.4 | E309L-17 | EN ISO 3581-A | E 23 12 LR 32 |
| LINOX 316L | 0.035 | 0.9 | 0.8 | ≤0.025 | ≤0.025 | 12.0 | 19.0 | 2.6 | AWS A5.4 | E316L-17 | EN ISO 3581-A | E 19 12 3 LR 32 |
| LINOX P 308L | 0.025 | 0.8 | 0.6 | - | - | 9.5 | 19.0 | - | AWS A5.4 | E308L-16 | EN ISO 3581-A | E 19 19 LR 32 |
| LINOX P 309L | 0.025 | 0.8 | 0.6 | - | - | 13.0 | 23.5 | - | AWS A5.4 | E309L-16 | EN ISO 3581-A | E 23 12 LR 32 |
| LINOX P 316L | 0.025 | 0.8 | 0.6 | - | - | 12.0 | 19.0 | 2.5 | AWS A5.4 | E316L-16 | EN ISO 3581-A | E 19 12 3 LR 32 |

STICK ELECTRODES FOR ALUMINIUM ALLOYS

| Product name | Chemical composition (typical values) in % | | | | | | | | | | AWS | EN/ISO |
|--------------|--|----------|------|-----------|-----------|----------|-----------|-----------|----------|--------|----------------|------------|
| | Mn | Si | Al | Cu | Mg | Fe | Zn | Others | | | | |
| ALMN | 0.9-1.2 | 0.3 max. | bal. | 0.02 max. | 0.15 max. | 0.6 max. | 0.09 max. | 0.15 max. | AWS A5.3 | E3003 | EN ISO 18273-A | Al 3103 |
| AlS12 | - | 12.0 | bal. | - | - | - | - | - | AWS A5.3 | E 4047 | EN ISO 18273-A | EI-AISI 12 |
| AlS15 | - | 5.0 | bal. | - | - | - | - | - | AWS A5.3 | E 4043 | EN ISO 18273-A | EI-AISI 15 |

MIG WIRES FOR MILD STEEL

| Product name | Chemical composition (typical values) in % | | | | | AWS | EN/ISO |
|--------------------|--|------|------|-----------|---------|----------------|---|
| | C | Mn | Si | | | | |
| LNM 25 | 0.08 | 1.1 | 0.6 | AWS A5.18 | ER70S-3 | EN ISO 14341-A | G 42 4, M21 2S1 |
| Supramig® | 0.08 | 1.40 | 0.85 | AWS A5.18 | ER70S-6 | EN ISO 14341-A | G42 3 C1 3S11 / G46 4 M21 3S11 |
| Supramig® HD | 0.08 | 1.40 | 0.85 | AWS A5.18 | ER70S-6 | EN ISO 14341-A | G42 3 C1 3S11 / G46 4 M21 3S11 |
| Supramig® Ultra | 0.08 | 1.70 | 0.85 | AWS A5.18 | ER70S-6 | EN ISO 14341-A | G46 3 C1 4S11 / G50 5 M21 4S11 |
| Supramig® Ultra HD | 0.08 | 1.70 | 0.85 | AWS A5.18 | ER70S-6 | EN ISO 14341-A | G46 3 C1 4S11 / G50 5 M21 4S11 |
| Ultramag® | 0.08 | 1.40 | 0.85 | AWS A5.18 | ER70S-6 | EN ISO 14341-A | G42 3 C1 3S11 / G46 4 M20 3S11 / G46 4 M21 3S11 |
| Ultramag® SG3 | 0.08 | 1.70 | 0.85 | AWS A5.18 | ER70S-6 | EN ISO 14341-A | G46 3 C1 4S11 / G46 5 M20 4S11 / G46 5 M21 4S11 |

MIG WIRES FOR LOW ALLOY STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | | | AWS | EN/ISO | |
|------------------|--|------|------|------|------|-------|------|-------|------|------|------|---|-----------|-----------|----------------|-----------------------|
| | C | Mn | Si | Cr | Ni | Mo | Cu | Al | Ti | S | P | V | | | | |
| LNM 12 | 0.1 | 1.12 | 0.6 | - | - | 0.5 | - | - | - | - | - | - | AWS A5.28 | ER70S-A1 | EN ISO 14341-A | G 46 3 M21 2Mo |
| LNM 19 | 0.1 | 1.0 | 0.5 | 1.2 | - | 0.5 | - | - | - | - | - | - | AWS A5.28 | ER80S-G* | EN ISO 21952-A | G CrMo1Si |
| LNM 20 | 0.08 | 0.9 | 0.6 | 2.5 | - | 1.0 | - | - | - | - | - | - | AWS A5.28 | ER90S-G* | EN ISO 21952-A | G CrMo2Si |
| LNM MoNi | 0.10 | 1.65 | 0.75 | 0.60 | 0.55 | 0.30 | 0.08 | - | - | - | - | - | AWS A5.28 | ER100S-G | EN ISO 16834-A | G 62 4 M21 Mn3NiCrMo |
| LNM MoNiCr | 0.09 | 1.8 | 0.80 | 0.30 | 2.20 | 0.55 | - | - | - | - | - | - | AWS A5.28 | ER120S-G | EN ISO 16834-A | G 89 4 M21 Mn4Ni2CrMo |
| LNM MoNiVa | 0.08 | 1.7 | 0.44 | 0.23 | 1.35 | 0.3 | 0.25 | - | - | - | 0.08 | - | AWS A5.28 | ER110S-G | EN ISO 16834-A | G 69 4 M21 Mn3Ni1CrMo |
| LNM Ni1 | 0.09 | 1.2 | 0.6 | - | 0.9 | - | - | - | - | - | - | - | AWS A5.28 | ER80S-Ni1 | EN ISO 14341-A | G 46 5 M21 3Ni1 |
| LNM Ni2.5 | 0.1 | 1.1 | 0.55 | - | 2.4 | - | - | - | - | - | - | - | AWS A5.28 | ER80S-Ni2 | EN ISO 14341-A | G46 6 M21 2Ni2 |
| Pipeliner® 80Ni1 | 0.07 | 1.55 | 0.70 | - | 0.90 | <0.01 | - | <0.01 | 0.08 | 0.10 | 0.11 | - | AWS A5.28 | ER80S-G | EN ISO 14341-A | G 3Ni1 |
| LNM 28 | 0.1 | 1.4 | 0.75 | - | 0.8 | - | 0.3 | - | - | - | - | - | AWS A5.28 | ER 80S-G | EN ISO 16834-A | G Z Mn3Ni1Cu* |

MIG WIRES FOR HARDFACING APPLICATIONS

| Product name | Chemical composition (typical values) in % | | | | | AWS | EN/ISO |
|--------------|--|-----|-----|-----|---|----------------|--------|
| | C | Mn | Si | Cr | | | |
| LNM 420FM | 0.5 | 0.4 | 3.0 | 9.0 | - | EN ISO 14700-A | S Fe8 |

* Nearest classification

MIG WIRES FOR STAINLESS STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | | | | AWS | EN/ISO | |
|--------------|--|-----|------|------|------|------|------|--|--|--|----------|----------------|----------------|
| | C | Mn | Si | Cr | Ni | Mo | Nb | | | | | | |
| LNM 304LSi | 0.02 | 1.9 | 0.8 | 20 | 10 | 0.1 | - | | | | AWS A5.9 | EN ISO 14343-A | G 19 9 LSi |
| LNM 307 | 0.07 | 7.1 | 0.8 | 18.6 | 8.0 | - | - | | | | AWS A5.9 | EN ISO 14343-A | G 18 8 Mn |
| LNM 309H | 0.08 | 1.8 | 0.4 | 23.6 | 13.2 | 0.1 | - | | | | AWS A5.9 | - | - |
| LNM 309LSi | 0.02 | 1.8 | 0.8 | 23.3 | 13.8 | 0.14 | - | | | | AWS A5.9 | EN ISO 14343-A | G 23 12 L Si |
| LNM 310 | 0.1 | 1.7 | 0.45 | 26 | 21 | 0.1 | - | | | | AWS A5.9 | EN ISO 14343-A | G 25 20 |
| LNM 316LSi | 0.01 | 1.8 | 0.8 | 18.5 | 12.2 | 2.5 | - | | | | AWS A5.9 | EN ISO 14343-A | G 19 12 3 LSi |
| LNM 318Si | 0.05 | 1.4 | 0.7 | 18.6 | 11.7 | 2.5 | 0.7 | | | | AWS A5.9 | EN ISO 14343-A | G 19 12 3 NbSi |
| LNM 347Si | 0.05 | 1.4 | 0.7 | 19.2 | 9.9 | 0.1 | 0.6 | | | | AWS A5.9 | EN ISO 14343-A | G 19 9 NbSi |
| LNM 4455 | 0.015 | 7 | 0.4 | 20 | 16 | 3.0 | 0.15 | | | | AWS A5.9 | EN ISO 14343-A | G 20 16 3 Mn L |

MIG WIRES FOR NI-BASE ALLOYS

| Product name | Chemical composition (typical values) in % | | | | | | | | | | AWS | EN/ISO | |
|--------------|--|-----|-----|------|----|-----|-----|--|--|--|----------|----------------|----------------------|
| | Mn | Si | Ni | Cu | Al | Zn | Sn | | | | | | |
| LNM CuAl8 | 0.3 | - | - | bal. | 8 | - | - | | | | AWS A5.7 | EN ISO 24373-A | S Cu 6100 (CuAl7) |
| LNM CuSi3 | 1.0 | 3.0 | - | bal. | - | 0.1 | 0.1 | | | | AWS A5.7 | EN ISO 24373-A | S Cu 6560 (CuSi3Mn1) |
| LNM CuSn | 0.2 | 0.3 | 0.1 | bal. | - | - | 0.8 | | | | AWS A5.7 | EN ISO 24373-A | S Cu 1898 (CuSn1) |

MIG WIRES FOR ALUMINIUM

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | | | AWS | EN/ISO | | |
|-------------------------|--|-------|------|----------|------|------|---------|----------|---------|----------|------|--|--|----------|---------|----------------|----------------------------|
| | Mn | Si | Cr | Cu | Al | Ti | Be | Mg | Fe | Zn | Zr | | | | | | |
| SuperGlaze® MIG 4043 | 0.01 | 5.26 | - | 0.01 | bal. | 0.01 | <0.0002 | 0.03 | 0.15 | 0.001 | - | | | AWS 5.10 | ER4043 | EN ISO 18273-A | S Al 4043A (AlSi5) |
| SuperGlaze® MIG 4047 | max.0.15 | 11-13 | - | max.0.30 | bal. | - | 0.0003 | max.0.10 | max.0.8 | max.0.20 | - | | | AWS 5.10 | ER4047 | EN ISO 18273-A | S Al 4047 (AlSi12) |
| SuperGlaze® MIG 5087 | 0.7 | 0.06 | 0.07 | - | bal. | 0.01 | 0.0002 | 4.9 | 0.13 | - | 0.12 | | | AWS 5.10 | ER5087 | EN ISO 18273-A | S Al 5087 (AlMg4.5MnZr) |
| SuperGlaze® MIG 5183 | 0.65 | 0.03 | 0.10 | 0.001 | bal. | 0.01 | 0.0002 | 4.99 | 0.13 | 0.02 | - | | | AWS 5.10 | ER5183 | EN ISO 18273-A | S Al 5183 (AlMg4.5Mn0.7Al) |
| SuperGlaze® MIG 5356 | 0.12 | 0.05 | 0.08 | 0.03 | bal. | 0.15 | 0.0002 | 4.90 | 0.09 | <0.01 | - | | | AWS 5.10 | ER5356 | EN ISO 18273-A | S Al 5356 (AlMg5CrAl) |
| SuperGlaze® MIG 5556A | 0.6 | 0.05 | 0.08 | - | bal. | 0.09 | 0.0002 | 5.1 | 0.11 | - | - | | | AWS 5.10 | ER5556A | EN ISO 18273-A | S Al 5556A (AlMg5Mn) |
| SuperGlaze® MIG 5754 | 0.29 | 0.07 | 0.06 | 0.01 | bal. | 0.05 | 0.0004 | 3.0 | 0.13 | - | - | | | AWS 5.10 | ER5754 | EN ISO 18273-A | S Al 5754 (AlMg3) |
| SuperGlaze® MIG HD 5183 | 0.65 | 0.03 | 0.10 | 0.001 | bal. | 0.07 | 0.0002 | 4.99 | 0.13 | 0.02 | - | | | AWS 5.10 | ER5183 | EN ISO 18273-A | S Al 5183 (AlMg4.5Mn0.7Al) |
| SuperGlaze® MIG HD 5356 | 0.12 | 0.05 | 0.08 | 0.03 | bal. | 0.15 | 0.0002 | 4.90 | 0.09 | <0.01 | - | | | AWS 5.10 | ER5356 | EN ISO 18273-A | S Al 5356 (AlMg5CrAl) |

* Nearest classification

TIG RODS FOR MILD STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | AWS | EN/ISO |
|--------------|--|------|-----|------|------|------|-----------|---------|-----------------------------|
| | C | Mn | Si | Al | Ti | Zr | | | |
| LNT 24 | 0.05 | 1.20 | 0.5 | 0.08 | 0.10 | 0.05 | AWS A5.18 | ER70S-2 | - |
| LNT 25 | 0.08 | 1.1 | 0.6 | - | - | - | AWS A5.18 | ER70S-3 | EN ISO 636-A W 42.5 2Si |
| LNT 26 | 0.1 | 1.5 | 0.9 | - | - | - | AWS A5.18 | ER70S-6 | EN ISO 636-A W 42.5 3Si1 |
| LNT 27 | 0.1 | 1.5 | 0.9 | - | - | - | AWS A5.18 | ER70S-6 | EN ISO 636-A W 46.5 4Si1 |

TIG RODS FOR LOW ALLOY STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | AWS | EN/ISO |
|--------------|--|-----|------|-----|-----|-----|-----------|------------|-----------------------------|
| | C | Mn | Si | Cr | Mo | Ni | Cu | | |
| LNT 12 | 0.1 | 1.2 | 0.6 | - | 0.5 | - | AWS A5.28 | ER70S-A1 | EN ISO 636-A W 46.3 2Mo |
| LNT 19 | 0.1 | 1.0 | 0.6 | 1.2 | 0.5 | - | AWS A5.28 | ER80S-G* | EN ISO 21952-A W CrMo1Si |
| LNT 20 | 0.08 | 1.0 | 0.6 | 2.5 | 1.0 | - | AWS A5.28 | ER90S-G* | EN ISO 21952-A W CrMo2Si |
| LNT 28 | 0.1 | 1.4 | 0.75 | - | - | 0.8 | AWS A5.28 | ER80S-G | - |
| LNT N1 | 0.1 | 1.2 | 0.6 | - | - | 0.9 | AWS A5.28 | ER80S-Ni 1 | EN ISO 636-A W 42.6 3Ni1 |
| LNT N2.5 | 0.1 | 1.1 | 0.55 | - | - | 2.4 | AWS A5.28 | ER80S-Ni2 | EN ISO 636-A W 46.6 2Ni2 |

TIG RODS FOR STAINLESS STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | AWS | EN/ISO |
|--------------|--|------|-----|------|------|------|--------|----------|---|
| | C | Mn | Si | Cr | Mo | Ni | Nb/N | | |
| LNT 304L | 0.01 | 1.7 | 0.4 | 20 | 0.1 | 10 | - | AWS A5.9 | ER308L EN ISO 14343-A W 19.9 L |
| LNT 304LSi | 0.02 | 2.0 | 0.8 | 20 | 0.1 | 10 | - | AWS A5.9 | ER308LSi EN ISO 14343-A W 19.9 LSi |
| LNT 309L | 0.01 | 1.65 | 0.5 | 24 | 0.1 | 13 | - | AWS A5.9 | ER309L EN ISO 14343-A W 23.12 L |
| LNT 309LSi | 0.02 | 2.0 | 0.8 | 23.5 | 0.1 | 13 | - | AWS A5.9 | ER309LSi EN ISO 14343-A W 23.12 LSi |
| LNT 316L | 0.01 | 1.5 | 0.5 | 18.5 | 2.7 | 12 | - | AWS A5.9 | ER316L EN ISO 14343-A W 19.12 3 L |
| LNT 316LSi | 0.03 | 1.9 | 0.8 | 18.5 | 2.7 | 12.0 | - | AWS A5.9 | ER316LSi EN ISO 14343-A W 19.12 3 LSi |
| LNT 347Si | 0.05 | 1.4 | 0.7 | 19.5 | 0.01 | 9.5 | Nb 0.6 | AWS A5.9 | ER347Si EN ISO 14343-A W 19.9 Nb Si |
| LNT 310 | 0.10 | 1.7 | 0.5 | 26 | 0.1 | 21 | - | AWS A5.9 | ER310 EN ISO 14343-A W 25.20 |
| LNT 4455 | 0.015 | 7.0 | 0.4 | 20 | 3.0 | 16 | N 0.15 | AWS A5.9 | ER316Mn EN ISO 14343-A W 20.16 3 MnL |

* Nearest classification

TIG RODS FOR CU BASE ALLOYS

| Product name | Chemical composition (typical values) in % | | | | | | AWS | EN/ISO |
|--------------|--|-----|------|-----|-----|-----|----------------------|--|
| | Mn | Si | Cu | Zn | Sn | P | | |
| LNT CuSi3 | 1.0 | 3.0 | bal. | 0.1 | 0.1 | - | AWS A5.7 ERCuSi-A | EN ISO 24373-A S Cu 6560 (CuSi3Mn1) |
| LNT CuSn6 | - | - | bal. | - | 6.0 | 0.2 | AWS A5.7 ERCuSn-A | EN ISO 24373-A S Cu 5180 (CuSn6P) |

TIG RODS FOR ALUMINIUM

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | AWS | EN/ISO |
|----------------------|--|------|------|-------|------|-------|--------|-------|------|------|--|-------------------|--|
| | Mn | Si | Cr | Cu | Al | Ti | Be | Zn | Mg | Fe | | | |
| SuperGlaze® TIG 4043 | 0.009 | 5.01 | - | 0.008 | bal. | 0.007 | 0.0002 | 0.002 | 0.03 | 0.13 | | AWS 5.10 R4043 | EN ISO 18273-A S Al 4043A (AlSi5) |
| SuperGlaze® TIG 5183 | 0.65 | 0.03 | 0.10 | 0.001 | bal. | 0.07 | 0.0002 | 0.02 | 4.99 | 0.13 | | AWS 5.10 R5183 | EN ISO 18273-A S Al 5183 (AlMg4.5Mn0.7(Al)) |
| SuperGlaze® TIG 5356 | 0.12 | 0.06 | 0.12 | 0.02 | bal. | 0.09 | 0.0002 | 0.001 | 4.84 | 0.09 | | AWS 5.10 R5356 | EN ISO 18273-A S Al 5356 (AlMg5Cr(Al)) |
| SuperGlaze® TIG 5754 | 0.29 | 0.07 | 0.06 | 0.01 | bal. | 0.05 | 0.0004 | - | 3.0 | 0.13 | | AWS 5.10 R5754 | EN ISO 18273-A S Al 5754 (AlMg3) |

GAS SHIELDED FLUX-CORED WIRES (MILD AND LOW ALLOY STEEL)

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | AWS | EN/ISO | | | |
|-------------------------|--|-------|------|------|-------|-------|------|------|------|------|---|-----|-----------|-------------------------------|----------------|-----------------------|
| | Gas | C | Mn | Si | P | S | Ni | Cr | Mo | Cu | | | | | | |
| Outershield® 71E-H | M21 | 0.04 | 1.4 | 0.6 | 0.013 | 0.010 | - | - | - | - | - | - | AWS A5.20 | E71T-1M-J | EN ISO 17632-A | T 46 3 P M 1 H5 |
| Outershield® 71E-H | C1 | 0.05 | 1.3 | 0.6 | 0.015 | 0.010 | - | - | - | - | - | - | AWS A5.20 | E71T-1M-J | EN ISO 17632-A | T 46 3 P M 1 H5 |
| Outershield® 71M-H | C1 | 0.05 | 1.3 | 0.4 | 0.015 | 0.009 | - | - | - | - | - | - | AWS A5.20 | E71T-1/9C-H4 /E71T-1/9M-H4 | EN ISO 17632-A | T 46 3 P C 1 H5 |
| Outershield® 71M-H | M21 | 0.05 | 1.47 | 0.5 | 0.015 | 0.009 | - | - | - | - | - | - | AWS A5.20 | E71T-1/9C-H4 /E71T-1/9M-H4 | EN ISO 17632-A | T 46 3 P C 1 H5 |
| Outershield® 71M5-H | C1 | 0.05 | 1.35 | 0.4 | 0.015 | 0.010 | 0.4 | - | - | - | - | - | - | - | EN ISO 17632-A | T 46 4 P C 2 H5 |
| Outershield® 71T1 | C1 | 0.05 | 1.1 | 0.3 | 0.015 | 0.010 | - | - | - | - | - | - | AWS | E71T1-C-H8 | EN ISO | T 46 4 P C 2 H10 |
| Outershield® MC700 | M21 | 0.05 | 1.35 | 0.6 | 0.015 | 0.023 | - | - | - | - | - | - | AWS A5.18 | E70C-6M H48 | EN ISO 17632-A | T 46 2 M M 2 H10 |
| Outershield® MC-710-H | M21 | 0.05 | 1.35 | 0.6 | 0.015 | 0.023 | - | - | - | - | - | - | AWS A5.18 | E70C-6M H4 | EN ISO 17632-A | T 46 3 M M 2 H5 |
| Outershield® MC710RF-H | M21 | 0.05 | 1.35 | 0.6 | 0.015 | 0.023 | - | - | - | - | - | - | AWS A5.18 | E70C-6M H4 | EN ISO 17632-A | T 46 3 M M 2 H5 |
| Outershield® MC715-H | M21 | 0.04 | 1.5 | 0.4 | 0.012 | 0.020 | - | - | - | - | - | - | AWS A5.18 | E70C-6M H4 | EN ISO 17632-A | T 46 4 B C 2 H5 |
| Outershield® T55-H | C1 | 0.05 | 1.5 | 0.55 | 0.012 | 0.010 | - | - | - | - | - | - | AWS A5.20 | E71T-5C-JH4 | EN ISO 17632-A | T 42 4 B C 2 H5 |
| Outershield® T55-H | M21 | 0.06 | 1.5 | 0.6 | 0.012 | 0.010 | - | - | - | - | - | - | AWS A5.20 | E71T-5C-JH4 | EN ISO 17632-A | T 42 4 B C 2 H5 |
| Outershield® 12-H | M21 | 0.065 | 0.8 | 0.2 | 0.014 | 0.010 | - | - | 0.46 | - | - | - | AWS A5.29 | E 81T1-A1M-H4 | EN ISO 17634-A | T MoL P M 2 H5 |
| Outershield® 19-H | M21 | 0.07 | 0.74 | 0.24 | 0.013 | 0.010 | - | 1.24 | 0.52 | - | - | - | AWS A5.29 | E 81T1-B2M-H4 | EN ISO 17634-A | T CrMo1 P M 2 H5 |
| Outershield® 20-H | M21 | 0.07 | 0.75 | 0.21 | 0.013 | 0.008 | - | 2.23 | 1.09 | - | - | - | AWS A5.29 | E 91T1-B3M-H4 | EN ISO 17634-A | T CrMo2 P M 2 H5 |
| Outershield® 500CT-H | M21 | 0.04 | 1.3 | 0.2 | 0.014 | 0.010 | 0.84 | - | - | 0.39 | - | - | AWS A5.29 | E81T1-GM | EN ISO 18276-A | T 50 5 Z P M 2 H5 |
| Outershield® 555CT-H | M21 | 0.03 | 1.1 | 0.4 | 0.015 | 0.010 | 0.60 | 0.55 | - | 0.55 | - | - | AWS A5.29 | E81T1-W2M-J | EN ISO 18276-B | T555T1-TMA-NCC1-UH5 |
| Outershield® 690-H | M21 | 0.06 | 1.5 | 0.2 | 0.015 | 0.010 | 2.0 | - | 0.3 | - | - | - | AWS A5.29 | E 11T1-K3M-JH4 | EN ISO 18276-A | T 69 4 Z P M 2 H5 |
| Outershield® 690-HSR | M21 | 0.06 | 1.5 | 0.2 | 0.015 | 0.010 | 2.0 | - | 0.5 | - | - | - | AWS A5.29 | E 11T1-K3M-J | EN ISO 18276-A | T 69 4 Z P M 2 H5 T |
| Outershield® 81K2-H | M21 | 0.04 | 1.4 | 0.2 | 0.012 | 0.010 | 1.4 | - | - | - | - | - | AWS A5.29 | E81T1-K2M-J | EN ISO 17632-A | T 50 6 1.5M P M 2 H5 |
| Outershield® 81K2-HSR | M21 | 0.06 | 1.3 | 0.3 | 0.012 | 0.010 | 1.4 | - | - | - | - | - | AWS A5.29 | E81T1-K2M-J | EN ISO 17632-A | T 50 6 1.5M P M 2 H5 |
| Outershield® 81Ni1-H | M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 0.95 | - | - | - | - | - | AWS A5.29 | E81T1-Ni1M-J | EN ISO 17632-A | T 50 5 1NiP M 2 H5 |
| Outershield® 81Ni1-HSR | M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 0.95 | - | - | - | - | - | AWS A5.29 | E81T1-Ni1M-J | EN ISO 17632-A | T 55 4 1NiMo P M 2 H5 |
| Outershield® 91K2-HSR | M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 1.4 | - | 0.4 | - | - | - | AWS A5.29 | E91T1-GM | EN ISO 18276-A | T 55 4 1NiMo P M 2 H5 |
| Outershield® 91Ni1-HSR | M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 0.95 | - | 0.4 | - | - | - | AWS A5.29 | E91T1-GM | EN ISO 18276-A | T 55 4 1NiMo P M 2 H5 |
| Outershield® 101Ni1-HSR | M21 | 0.06 | 2.0 | 0.3 | 0.013 | 0.010 | 0.95 | - | 0.4 | - | - | - | AWS A5.29 | E91T1-GM | - | - |
| Outershield® MC420N-H | M21 | 0.03 | 0.6 | 0.45 | 0.017 | 0.023 | 2.9 | 0.03 | - | - | - | - | AWS A5.28 | E70C-GM H4 | EN ISO 17632-A | T 38 Z M M 2 H5 |
| Outershield® MC555CT-H | M21 | 0.03 | 1.3 | 0.4 | 0.015 | 0.020 | 0.55 | 0.55 | - | 0.55 | - | - | AWS A5.28 | E81T1-W2M-J | EN ISO 17632-B | T554T15-0MA-NCC1-UH5 |
| Outershield® MC715Ni1-H | M21 | 0.05 | 1.35 | 0.45 | 0.020 | 0.020 | 0.95 | - | - | - | - | - | AWS A5.28 | E70C-6M H4 | EN ISO 17632-A | T 46 5 1Ni M M 2 H5 |
| Outershield® MC80D2-H | M21 | 0.06 | 1.45 | 0.54 | 0.010 | 0.010 | - | - | - | - | - | - | AWS A5.28 | E80T15-M21G2-G | EN ISO 17632-A | T 55 3 T15 0 M21 G |
| Pipeliner® G60M-E | M21 | 0.04 | 1.35 | 0.25 | 0.013 | 0.008 | 0.45 | - | - | - | - | - | AWS | E71T1/9-M-H4 | EN ISO | T 46 4 P M1 H5 |
| Pipeliner® G70M-E | M21 | 0.06 | 1.5 | 0.2 | 0.013 | 0.010 | 0.95 | - | 0.15 | - | - | - | AWS | E81T1-GM-H4 | EN ISO | T 50 5 Z P M 2 H5 |
| Pipeliner® G80M-E | M21 | 0.06 | 1.4 | 0.3 | 0.013 | 0.010 | 0.95 | - | 0.4 | - | - | - | AWS A5.29 | E91T1-GM | EN ISO 17632-A | T 55 4 1NiMo P M 2 H5 |

SELF-SHIELDED FLUX-CORED WIRES

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | AWS | EM/ISO | | |
|--------------------------|--|-----------|-----------|-------------|-------------|-----------|------|-----------|------|-------|-------|-----|---------------|----------------|----------------------|
| | C | Mn | Si | P | S | Ni | Cr | Al | Mo | Ti | N | | | | |
| Innershield® NR®-152 | 0.30 | 0.99 | 0.24 | 0.013 | 0.007 | - | - | 1.63 | - | 0.003 | 0.051 | - | E71T-14 | EN ISO 17632-A | T 42 4 1Ni Y N 1 H10 |
| Innershield® NR®-203 Ni1 | 0.08 | 1.1 | 0.27 | 0.008 | 0.003 | 0.9 | - | 0.85 | - | - | - | - | - | - | - |
| Innershield® NR®-203MP | 0.04-0.07 | 1.35-1.47 | 0.22-0.32 | ≤0.01 | ≤0.01 | - | - | - | - | - | - | - | - | - | - |
| Innershield® NR®-207 | 0.07 | 0.9 | 0.2 | 0.005 | 0.003 | 0.8 | - | 1.0 | - | - | - | - | E71T8-H6-H16 | - | - |
| Innershield® NR®-211-MP | 0.21 | 0.65 | 0.25 | 0.010 | 0.003 | - | - | 1.3 | - | - | - | - | - | - | - |
| Innershield® NR®-212 | 0.06-0.11 | 0.84-1.55 | 0.20-0.33 | 0.006-0.009 | <0.03 | 1.02-1.15 | - | 1.3-1.6 | - | - | - | - | E71TG-G | EN ISO 17632-A | T 42 2 Y N 2 H10 |
| Innershield® NR®-232 | 0.18 | 0.65 | 0.27 | 0.006 | 0.004 | - | - | 0.55 | - | - | - | - | - | EN ISO 17632-A | T 42 3 Y N 2 H10 |
| Innershield® NR®-233 | 0.16 | 0.65 | 0.21 | 0.010 | 0.003 | - | - | 0.60 | - | - | - | - | - | - | - |
| Innershield® NR®-311 | 0.27 | 0.4 | 0.08 | 0.007 | 0.005 | - | - | 1.5 | - | - | - | - | E71T8-Ni2-JH8 | - | - |
| Innershield® NR®-440Ni2 | 0.01-0.03 | 0.74-1.12 | 0.13-0.17 | 0.007-0.012 | 0.002-0.004 | 1.77-2.10 | - | 0.84-1.07 | - | - | - | - | E70T-4 | EN ISO 17632-A | T 38 Z V N 3 |
| Innershield® NS-3M | 0.20-0.27 | 0.35-0.45 | 0.26-0.30 | 0.011 | 0.004 | - | - | 1.30-1.50 | - | - | - | - | - | - | - |
| Pipeliner® NR®-208-XP | 0.02 | 2.15 | 0.12 | 0.005 | 0.002 | 0.75 | 0.04 | 1.0 | 0.02 | - | - | - | E81T8-G | - | - |

GAS SHIELDED FLUX-CORED WIRES (STAINLESS STEEL)

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | AWS | | EM/ISO |
|--------------------|--|------|-----|-----|------|------|-----|-----|-----------|----------------------|----------------|-----------------------|--|--------|
| | Gas | C | Mn | Si | Ni | Cr | Mo | Nb | AWS A5.22 | E308LT1-1/ E308LT1-4 | | | | |
| CLEAROSTA F 304L | M21/C1 | 0.03 | 1.3 | 0.7 | 10 | 19.5 | - | - | AWS A5.22 | E308LT1-1/ E308LT1-4 | EN ISO 17633-A | T 19 9 L P C / M 1 | | |
| CLEAROSTA F 309L | M21/C1 | 0.04 | 0.7 | 0.6 | 13 | 24.0 | - | - | AWS A5.22 | E309LT1-1/4 | EN ISO 17633-A | T 23 12 L P M 1 | | |
| CLEAROSTA F 316L | M21/C1 | 0.04 | 1.4 | 0.6 | 12.0 | 19.0 | - | - | AWS A5.22 | E316LT1-1/4 | EN ISO 17633-A | T 19 12 3 L P C / M 1 | | |
| Cor-A-Rosta® 304L | M21/C1 | 0.03 | 1.3 | 0.7 | 10 | 19.5 | - | - | AWS A5.22 | E308LT0-1/4 | EN ISO 17633-A | T 19 9 L P C / M 3 | | |
| Cor-A-Rosta® 309L | M21/C1 | 0.03 | 1.4 | 0.6 | 12.5 | 24 | - | - | AWS A5.22 | E309LT0-1/4 | EN ISO 17633-A | T 23 12 L R C / M 3 | | |
| Cor-A-Rosta® 316L | M21/C1 | 0.03 | 1.3 | 0.5 | 12 | 19 | 2.7 | - | AWS A5.22 | E316LT0-1/4 | EN ISO 17633-A | T 19 12 3 L R C / M 3 | | |
| Cor-A-Rosta® 347 | M21 | 0.05 | 1.4 | 0.6 | 10 | 19.5 | - | 0.5 | AWS A5.22 | E347T0-1/4 | EN ISO 17633-A | T 19 9 Nb R C / M 3 | | |
| Cor-A-Rosta® P304L | M21/C1 | 0.03 | 1.3 | 0.7 | 10 | 19.5 | - | - | AWS A5.22 | E308LT1-1/4 | EN ISO 17633-A | T 19 9 L P C / M 2 | | |
| Cor-A-Rosta® P309L | M21/C1 | 0.04 | 1.3 | 0.6 | 12.5 | 24 | - | - | AWS A5.22 | E309LT1-1/4 | EN ISO 17633-A | T 23 12 L P C / M 2 | | |
| Cor-A-Rosta® P316L | M21/C1 | 0.03 | 1.3 | 0.5 | 12 | 19 | 2.7 | - | AWS A5.22 | E316LT1-1/4 | EN ISO 17633-A | T 19 12 3 L P C / M 2 | | |

SELF SHIELDING FLUX CORED WIRES FOR HARDFACING APPLICATIONS

| Product name | Chemical composition (typical values) in % | | | | | | | | | | EN/ISO | |
|-----------------|--|------|------|-----|------|-----|-----|-----|---|---|--------|-------|
| | C | Mn | Si | Ni | Cr | Al | Mo | W | | | | |
| Lincore® 15CrMn | 0.4 | 15.0 | 0.25 | - | 16.0 | - | - | - | - | - | - | T Fe9 |
| Lincore® 33 | 0.15 | 2.0 | 0.7 | - | 2.0 | 1.6 | - | - | - | - | - | T Fe1 |
| Lincore® 50 | 2.2 | 1.2 | 1.0 | - | 11.0 | 0.6 | 0.5 | - | - | - | - | - |
| Lincore® 55 | 0.45 | 1.4 | 0.55 | - | 5.3 | 1.4 | 0.8 | - | - | - | - | T Fe2 |
| Lincore® 60-0 | 4.2 | 1.6 | 1.3 | - | 25.4 | 0.6 | - | - | - | - | - | - |
| Lincore® M | 0.6 | 13.0 | 0.4 | 0.5 | 4.9 | - | - | - | - | - | - | T Fe9 |
| Lincore® T&D | 0.65 | 1.5 | 0.8 | - | 7.0 | 1.8 | 1.4 | 1.6 | - | - | - | - |

SAW WIRES FOR MILD STEEL

| Product name | Chemical composition (typical values) in % | | | | AWS | EN/ISO |
|--------------|--|------|------|-----------|-------|-----------------------|
| | C | Mn | Si | | | |
| L50M | 0.1 | 1.75 | 0.25 | AWS A5.17 | EH12K | EN ISO 14171-A / S3Si |
| L60 | 0.09 | 0.5 | 0.06 | AWS A5.17 | EL12 | EN ISO 14171-A / S1 |
| L61 | 0.1 | 1.0 | 0.25 | AWS A5.17 | EM12K | EN ISO 14171-A / S2Si |
| LNS 135 | 0.1 | 1.0 | 0.10 | AWS A5.17 | EM12K | EN ISO 14171-A / S2 |

SAW WIRES FOR LOW ALLOY STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | | | | | AWS | EN/ISO | | |
|--------------|--|------|------|-----|------|---------|----------|-------|---|-----|----------|-----|-----------|-------|------------------------------|
| | C | Mn | Si | Mo | Ni | Cr | P | Ti | B | Cu | S | | | | |
| L-70 | 0.1 | 0.9 | 0.10 | 0.5 | - | - | - | - | - | - | - | - | AWS A5.23 | EA1 | EN ISO 14171-A / S2Mo |
| LNS 133TB | 0.08 | 1.55 | 0.25 | - | - | - | 0.15 | 0.015 | - | - | - | - | AWS A5.23 | EG | EN ISO 14171-A / SZ |
| LNS 140A | 0.1 | 1.0 | 0.10 | 0.5 | - | - | - | - | - | - | - | - | AWS A5.23 | EA2 | EN ISO 14171-A / S2Mo |
| LNS 140TB | 0.06 | 1.1 | 0.20 | 0.5 | - | - | 0.13 | 0.013 | - | - | - | - | AWS A5.23 | EA2TB | EN ISO 14171-A / S2MoTB |
| LNS 150 | 0.13 | 0.8 | 0.15 | 0.5 | - | 1.2 | <0.010 | - | - | - | - | - | AWS A5.23 | EB2R | EN ISO 24598-A / S Cr Mo1 |
| LNS 151 | 0.10 | 0.6 | 0.12 | 1.0 | - | 2.5 | <0.010 | - | - | - | - | - | AWS A5.23 | EB3R | EN ISO 24598-A / S Cr Mo2 |
| LNS 160 | 0.10 | 1.1 | 0.15 | - | 0.9 | - | - | - | - | - | - | - | AWS A5.23 | EN1 | EN ISO 14171-A / S2Ni1 |
| LNS 162 | 0.10 | 1.1 | 0.15 | - | 2.2 | - | - | - | - | - | - | - | AWS A5.23 | EN2 | EN ISO 14171-A / S2Ni2 |
| LNS 163 | 0.11 | 1.0 | 0.25 | - | 0.7 | 0.2 max | 0.02 max | - | - | 0.5 | 0.02 max | - | AWS A5.23 | EG | EN ISO 14171-A / S2 NiTCu |
| LNS 164 | 0.12 | 1.75 | 0.10 | 0.5 | 0.95 | - | - | - | - | - | - | - | AWS A5.23 | EF3 | EN ISO 14171-A / S3Ni1Mo |
| LNS 165 | 0.08 | 1.4 | 0.20 | 0.2 | 0.95 | - | - | - | - | - | - | - | AWS A5.23 | EM5 | EN ISO 14171-A / S3Ni1Mo0.2 |
| LNS 168 | 0.10 | 1.6 | 0.15 | 0.6 | 2.3 | 0.7 | - | - | - | - | - | - | AWS A5.23 | EG | EN ISO 26304-A / S3Ni2.5CrMo |

SAW WIRES FOR STAINLESS STEEL

| Product name | Chemical composition (typical values) in % | | | | | | | | | AWS | EN/ISO |
|--------------|--|------|-----|------|-----|------|-----|------|----------|--------|-----------------------------|
| | C | Mn | Si | Mo | Ni | Cr | Nb | N | | | |
| LNS 304L | 0.015 | 1.8 | 0.4 | - | 10 | 20 | - | - | AWS A5.9 | ER308L | EN ISO 14343-A S 19 9 L |
| LNS 307 | 0.07 | 7.0 | 0.6 | - | 8.9 | 19 | - | - | AWS A5.9 | ER307 | EN ISO 14343-A S 18 8 Mn |
| LNS 309L | 0.02 | 1.8 | 0.4 | - | 13 | 24 | - | - | AWS A5.9 | ER309L | EN ISO 14343-A S 23 12 L |
| LNS 316L | 0.015 | 1.75 | 0.4 | 2.75 | 12 | 18.5 | - | - | AWS A5.9 | ER316L | EN ISO 14343-A S 19 12 3 L |
| LNS 347 | 0.04 | 1.6 | 0.4 | 0.1 | 9.7 | 19.5 | 0.6 | - | AWS A5.9 | ER347 | EN ISO 14343-A S 19 9 Nb |
| LNS 4462 | 0.015 | 1.6 | 0.5 | 3.1 | 8.6 | 23 | - | 0.16 | AWS A5.9 | ER2209 | EN ISO 14343-A S 22 9 3 N L |

SAW WIRES FOR NICKEL ALLOYS

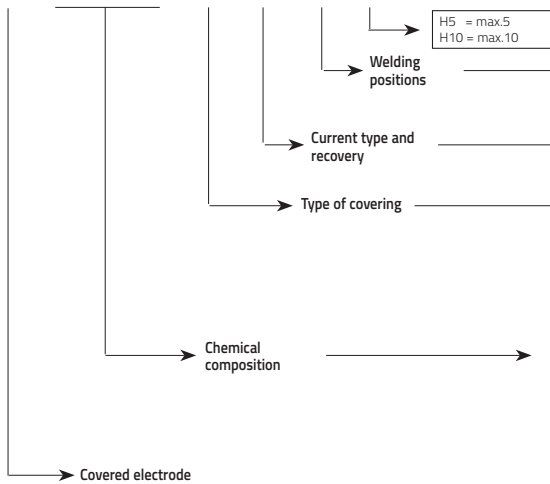
| Product name | Chemical composition (typical values) in % | | | | | | | | | | AWS | EN/ISO |
|------------------|--|------|------|-----|----|----|-----|-----|-----------|------------|------------------------|--------|
| | C | Mn | Si | Mo | Ni | Cr | Nb | Fe | | | | |
| LNS NiCr™ 60/20 | 0.05 | 0.02 | 0.1 | 8.7 | 65 | 22 | 3.7 | 0.1 | AWS A5.14 | ERNiCrMo-3 | EN ISO 18274 S Ni 6625 | |
| LNS NiCrMo 60/16 | 0.006 | 0.5 | 0.04 | 16 | 58 | 16 | - | 5.8 | AWS A5.14 | ERNiCrMo-4 | EN ISO 18274 S Ni 6276 | |

EN ISO 3580-A

Classification of covered electrodes for Manual Metal Arc Welding of creep resistant steels

SL 12 G

E Mo B 3 2 H5



- All positions
- All positions except vertical down
- Flat and horizontal-vertical butt / fillet weld
- Flat butt and fillet weld
- Vertical down and according to symbol 3

| Symbol | Recovery | Current type |
|--------|------------|--------------|
| 1 | ≤ 105 | AC + DC |
| 2 | | DC |
| 3 | >105 ≤ 125 | AC + DC |
| 4 | | DC |

| A | RA | Rutlo-cellulosic |
|----|----|------------------|
| C | RC | Rutlo-acid |
| R | RB | Rutlo-basic |
| RR | RB | Basic |

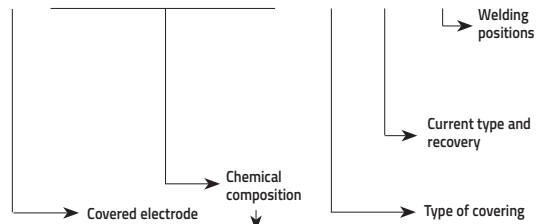
| Symbol | Cr | Mo | V | Others |
|---------|-----------|-----------|-----------|--------------|
| Mo | - | 0.40-0.70 | - | - |
| MoV | 0.30-0.60 | 0.8-1.20 | 0.25-0.60 | - |
| CrMo0.5 | 0.40-0.65 | 0.40-0.65 | - | - |
| CrMo1 | 0.9-1.40 | 0.45-0.70 | - | - |
| CrMo1L | 0.9-1.40 | 0.45-0.70 | - | C<0.05 |
| CrMoV1 | 0.9-1.30 | 0.90-1.30 | 0.10-0.35 | - |
| CrMo2 | 2.0-2.6 | 0.90-1.30 | - | - |
| CrMo2L | 2.0-2.6 | 0.90-1.30 | - | C<0.05 |
| CrMo5 | 4.0-6.0 | 0.40-0.70 | - | - |
| CrMo9 | 8.0-10.0 | 0.90-1.20 | 0.15 | Ni ≤ 1.0 |
| CrMo9L | 8.0-10.5 | 0.90-1.20 | 0.15-0.30 | Ni 0.40-1.0 |
| | | | | Nb 0.03-0.10 |
| | | | | W 0.02-0.07 |
| CrMoW12 | 10.0-12.0 | 0.80-1.20 | 0.20-0.40 | Ni ≤ 0.8 |
| | | | | W 0.40-0.60 |
| Z | | Other | | |

EN ISO 3581-A

Classification of covered electrodes for Manual Metal Arc Welding of stainless and heat-resisting steels

Limarosta 316L

E 19 12 3 L R 1 2



- All positions
- All positions except vertical down
- Flat and horizontal-vertical butt / fillet weld
- Flat butt and fillet weld
- Vertical down and according to symbol 3

| Symbol | Recovery | Current type |
|--------|------------|--------------|
| 1 | ≤ 105 | AC + DC |
| 2 | | DC |
| 3 | >105 ≤ 125 | AC + DC |
| 4 | | DC |
| 5 | >125 ≤ 160 | AC + DC |
| 6 | | DC |

| R | RB |
|-------|-------------|
| Rutlo | Rutlo-basic |

| | C | Mn | Cr | Ni | Mo | Other |
|---|------|-----|-------|-------|-------|-------|
| Martensitic/ferritic | | | | | | |
| 13 | 0.12 | 1.5 | 11-14 | - | - | - |
| 13.4 | 0.06 | 1.5 | 11-14 | 3-5 | 0.4-1 | - |
| 17 | 0.12 | 1.5 | 16-18 | - | - | - |
| Austenitic | | | | | | |
| 19.9 | 0.08 | 2.0 | 18-21 | 9-11 | - | - |
| 19.9 L | 0.04 | 2.0 | 18-21 | 9-11 | - | - |
| 19.9 Nb | 0.08 | 2.0 | 18-21 | 9-11 | - | Nb |
| 19.12.2 | 0.08 | 2.0 | 17-20 | 10-13 | 2-3 | - |
| 19.12.3 L | 0.04 | 2.0 | 17-20 | 10-13 | 2-3 | - |
| 19.12.3 Nb | 0.08 | 2.0 | 17-20 | 10-13 | 2-3 | Nb |
| 19.13.4 N L | 0.04 | 1-5 | 17-20 | 12-15 | 3-4 | 0.20N |
| Austenitic/Ferritic, high corrosion resistance | | | | | | |
| 22.9.3 N L | 0.04 | 2.5 | 21-24 | 7-10 | 2-4 | 0.05 |
| 25.7.2 N L | 0.04 | 2.0 | 24-28 | 6-8 | 1-3 | 0.20N |
| 25.9.3 Cu N L | 0.04 | 2.5 | 24-27 | 7-10 | 2-4 | 0.05 |
| 25.9.4 N L | 0.04 | 2.5 | 24-27 | 8-10 | 2-4 | 0.05 |
| Fully austenitic, high corrosion resistance | | | | | | |
| 18.15.3 L | 0.04 | 1-4 | 16-19 | 14-17 | 2-3 | 0.05 |
| 18.16.5 N L | 0.04 | 1-4 | 17-20 | 15-19 | 3-5 | 0.20N |

| | C | Mn | Cr | Ni | Mo | Other |
|--|-----------|-------|-------|-------|-------|-------|
| Fully austenitic, high corrosion resistance (cont.) | | | | | | |
| 20.25.5 Cu N L | 0.04 | 1-4 | 19-22 | 24-27 | 4-7 | 0.05 |
| 20.16.3 Mn N L | 0.04 | 5-8 | 18-21 | 15-18 | 2-3 | 0.20N |
| 25.22.2 N L | 0.04 | 1-5 | 24-27 | 20-23 | 2-3 | 0.20N |
| 7.31.4 Cu L | 0.04 | 2-5 | 26-29 | 30-33 | 3-4 | 0.05 |
| Special | | | | | | |
| 18.8 Mn | 0.20 | 45-75 | 17-20 | 7-10 | - | - |
| 18.9 MnMo | 0.04-1.4 | 3-5 | 18-21 | 9-11 | 0.5-1 | 0.05 |
| 20.10.3 | 0.10 | 2.5 | 18-21 | 9-12 | 1-3 | 0.05 |
| 23.12 L | 0.04 | 2.5 | 22-25 | 11-14 | - | - |
| 23.12 Nb | 0.10 | 2.5 | 22-25 | 11-14 | - | Nb |
| 23.12 L | 0.04 | 2.5 | 22-25 | 11-14 | 2-3 | - |
| 29.9 | 0.15 | 2.5 | 27-31 | 8-12 | - | - |
| Heat resisting | | | | | | |
| 16.8.2 | 0.08 | 2.5 | 14-16 | 7-9 | 1-2 | 0.05 |
| 19.9 H | 0.04-0.08 | 2.0 | 18-21 | 9-11 | - | - |
| 25.4 | 0.15 | 2.5 | 24-27 | 4-6 | - | - |
| 22.12 | 0.06-0.20 | 1-5 | 20-23 | 10-13 | - | - |
| 25.20 | 0.06-0.20 | 1-5 | 23-27 | 18-22 | - | - |
| 25.20 H | 0.35-0.45 | 2.5 | 23-27 | 18-22 | - | - |
| 18.36 | 0.25 | 2.5 | 14-18 | 33-37 | - | - |

0.05 Nb
 0.10 - 0.25N
 0.20 - 0.20N, 1.5Cu, 1.0W
 1.2Cu
 0.7-1.5Cu

EN ISO 2560-A

Classification of covered electrodes for Manual Metal Arc Welding of non alloyed and fine grain steels

Kryo 1

E 50 6 Mn1Ni B 3 2 H5 H_{DM}(ml/100g)

Z = no requirem.
A = +20°C
0 = 0°C
2 = -20°C
3 = -30°C
4 = -40°C
5 = -50°C
6 = -60°C

H5 = max.5
H10 = max.10
H15 = max.15

1. All positions
2. All positions except vertical down
3. Flat and horizontal-vertical butt / fillet weld
4. Flat butt and fillet weld
5. Vertical down and according to symbol 3

| Symbol | Recovery | Current type |
|--------|------------|--------------|
| 1 | | AC + DC |
| 2 | ≤ 105 | DC |
| 3 | | AC + DC |
| 4 | >105 ≤ 125 | DC |
| 5 | | AC + DC |
| 6 | > 160 | DC |

| A | RC | Rutlo-cellulosic |
|----|----|------------------|
| C | RA | Rutlo-acid |
| R | RB | Rutlo-basic |
| RR | B | Basic |

| Symbol | Mn | Ni | Mo |
|--------|----------|----------|---------|
| Mo | 2,0 | - | - |
| MnMo | 1,4 | - | 0,3-0,6 |
| 1Ni | 1,4 | 0,6-0,12 | - |
| 2Ni | 1,4 | 1,8-2,6 | - |
| 3Ni | 1,4 | >2,6-3,8 | - |
| Mn1Ni | >1,4-2,0 | 0,6-0,12 | - |
| 1NiMo | 1,4 | 0,6-0,12 | 0,3-0,6 |
| Z | | Other | |

| Symbol | Yield | Tensile | A ₅ |
|--------|-------|---------|----------------|
| 35 | ≥ 355 | 440-570 | ≥ 22% |
| 38 | ≥ 380 | 470-600 | ≥ 20% |
| 42 | ≥ 420 | 500-640 | ≥ 20% |
| 46 | ≥ 460 | 530-680 | ≥ 20% |
| 50 | ≥ 500 | 560-720 | ≥ 18% |

Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

Covered electrode

EN-ISO 18275-A

Classification of covered electrodes for Manual Metal Arc Welding of high strength steels

Conarc 70G

E 55 4 1NiMo B 3 2 H5 T

Stress relieved 1h / 560-600°C

H_{DM} (ml/100g)

H5 = max.5
H10 = max.10

1. All positions
2. All positions except vertical down
3. Flat and horizontal-vertical butt / fillet weld
4. Flat butt and fillet weld
5. Vertical down and according to symbol 3

| Symbol | Recovery | Current type |
|--------|------------|--------------|
| 1 | | AC + DC |
| 2 | ≤ 105 | DC |
| 3 | | AC + DC |
| 4 | >105 ≤ 125 | DC |
| 5 | | AC + DC |
| 6 | > 160 | DC |

| A | RC | Rutlo-cellulosic |
|----|----|------------------|
| C | RA | Rutlo-acid |
| R | RB | Rutlo-basic |
| RR | B | Basic |

| Symbol | Mn | Ni | Cr | Mo |
|------------|---------|---------|---------|---------|
| MnMo | 1,4-2,0 | - | - | 0,3-0,6 |
| Mn1Ni | 1,4-2,0 | 0,6-1,2 | - | - |
| 1NiMo | <1,4 | 0,6-1,2 | - | 0,3-0,6 |
| 1,5NiMo | <1,4 | 1,2-1,8 | - | 0,3-0,6 |
| 2NiMo | <1,4 | 1,8-2,6 | - | 0,3-0,6 |
| Mn1NiMo | 1,4-2,0 | 0,6-1,2 | - | 0,3-0,6 |
| Mn2NiMo | 1,4-2,0 | 1,8-2,6 | - | 0,3-0,6 |
| Mn2NiCrMo | 1,4-2,0 | 1,8-2,6 | - | 0,3-0,6 |
| Mn2NiCrMo | 1,4-2,0 | 1,8-2,6 | 0,3-0,6 | 0,3-0,6 |
| Mn2Ni1CrMo | 1,4-2,0 | 1,8-2,6 | 0,6-1,0 | 0,3-0,6 |
| Z | | Other | | |

| Symbol | Yield | Tensile | A ₅ |
|--------|-------|----------|----------------|
| 55 | ≥ 550 | 610-780 | ≥ 18% |
| 62 | ≥ 620 | 690-890 | ≥ 18% |
| 69 | ≥ 690 | 760-960 | ≥ 17% |
| 79 | ≥ 790 | 880-1080 | ≥ 16% |
| 89 | ≥ 890 | 980-1180 | ≥ 15% |

Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

Covered electrode

EN ISO 14341-A

Classification of solid wires and deposits for MIG/MAG Welding of non alloy and fine grain steels

G 42 4 M 2Si

LNM 25

Z = no requirement.
 A = +20°C
 0 = 0°C
 2 = -20°C
 3 = -30°C
 4 = -40°C
 5 = -50°C
 6 = -60°C

Chemical composition

| Symbol | Si | Mn | Ni | Mo |
|--------|-----------|-----------|-----------|-----------|
| 0 | | | | |
| 2Si | 0,50-0,80 | 0,90-1,30 | 0,15 | 0,15 |
| 3Si1 | 0,70-1,00 | 1,30-1,60 | 0,15 | 0,15 |
| 4Si1 | 0,80-1,20 | 1,60-1,90 | 0,15 | 0,15 |
| 3Si2 | 1,00-1,30 | 1,30-1,60 | 0,15 | 0,15 |
| | | | Al | Ti + Zr |
| 2Ti | 0,40-0,80 | 0,90-1,40 | 0,05-0,20 | 0,05-0,25 |
| 3Ni1 | 0,50-0,90 | 1,00-1,60 | 0,80-1,50 | 0,15 |
| 2Ni2 | 0,40-0,80 | 0,80-1,40 | 2,10-2,70 | 0,15 |
| 2Mo | 0,30-0,70 | 0,90-1,30 | 0,15 | 0,40-0,60 |
| 4Mo | 0,50-0,80 | 1,70-2,10 | 0,15 | 0,40-0,60 |
| | | | | Al |
| 2Al | 0,30-0,50 | 0,90-1,30 | 0,15 | 0,35-0,75 |

Type of shielding gas

M = M2 mixed shielding gas (without helium)
 C = 100 CO2

Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

| Symbol | Yield | Tensile | A ₅ |
|--------|-------|---------|----------------|
| 35 | ≥ 355 | 440-570 | ≥ 22% |
| 38 | ≥ 380 | 470-600 | ≥ 20% |
| 42 | ≥ 420 | 500-640 | ≥ 20% |
| 46 | ≥ 460 | 530-680 | ≥ 20% |
| 50 | ≥ 500 | 560-720 | ≥ 18% |

Solid wire for GMAW-process

EN ISO 636-A

Classification of rods, wires and deposits for Tungsten Inert Gas Welding of non alloy and fine grain steels

W 46 3 3Si

LNT 25

Chemical composition

| Symbol | Si | Mn | Ni | Mo |
|--------|-----------|-----------|-----------|-----------|
| 0 | | | | |
| 2Si | 0,50-0,80 | 0,90-1,3 | | |
| 3Si1 | 0,70-1,00 | 1,30-1,60 | | |
| 4Si1 | 0,80-1,20 | 1,60-1,90 | | |
| | | | Al | Ti + Zr |
| 2Ti | 0,40-0,80 | 0,90-1,40 | 0,05-0,20 | 0,05-0,25 |
| 3Ni1 | 0,50-0,90 | 1,00-1,60 | 0,80-1,50 | |
| 2Ni2 | 0,40-0,80 | 0,80-1,40 | 2,10-2,70 | |
| 2Mo | 0,30-0,70 | 0,90-1,30 | | 0,40-0,60 |

Minimum impact of avg. 47 Joule at

Z = no requirement.
 A = +20°C
 0 = 0°C
 2 = -20°C
 3 = -30°C
 4 = -40°C
 5 = -50°C
 6 = -60°C

Min. yield strength (N/mm²)

| Symbol | Yield | Tensile | A ₅ |
|--------|-------|---------|----------------|
| 35 | ≥ 355 | 440-570 | ≥ 22% |
| 38 | ≥ 380 | 470-600 | ≥ 20% |
| 42 | ≥ 420 | 500-640 | ≥ 20% |
| 46 | ≥ 460 | 530-680 | ≥ 20% |
| 50 | ≥ 500 | 560-720 | ≥ 18% |

GTAW-process, wire and weld metal

EN ISO 14343-A

Classification of wire electrodes, wires and rods for arc welding stainless and heat-resisting steels

G 19 12 3 L Si

LNM 316 LSi

G = GMAW
W = GTAW
P = PAW
S = SAW

Chemical composition

Classification
Si = 0,65 - 1,2%

¹⁾ Nb
²⁾ 0,10 - 0,25N
³⁾ 0,10 - 0,20N, 1,5-2,5Cu
⁴⁾ 0,20-0,30N, 1,5Cu, 1,0W
⁵⁾ 1,2Cu
⁶⁾ 0,7-1,5Cu

| | C | Mn | Cr | Ni | Mo | Other |
|--|-----------|-------|-------|-------|-------|------------------------|
| Martensitic/ferritic | | | | | | |
| 13 | 0,12 | 1,5 | 11-14 | - | - | - |
| 13.4 | 0,06 | 1,5 | 11-14 | 3-5 | 0,4-1 | - |
| 17 | 0,12 | 1,5 | 16-18 | - | - | - |
| Austenitic | | | | | | |
| 19.9 | 0,08 | 2,0 | 18-21 | 9-11 | - | - |
| 19.9 L | 0,04 | 2,0 | 18-21 | 9-11 | - | - |
| 19.9 Nb | 0,08 | 2,0 | 18-21 | 9-11 | - | Nb |
| 19.12.2 | 0,08 | 2,0 | 17-20 | 10-13 | 2-3 | - |
| 19.12.3 L | 0,04 | 2,0 | 17-20 | 10-13 | 2-3 | - |
| 19.12.3 Nb | 0,08 | 2,0 | 17-20 | 10-13 | 2-3 | Nb |
| 19.13.4 N L | 0,04 | 1-5 | 17-20 | 12-15 | 3-4 | 0,20N |
| Austenitic/Ferritic, high corrosion resistance | | | | | | |
| 22.9.3 N L | 0,04 | 2,5 | 21-24 | 7-10 | 2-4 | ¹⁾ Si |
| 25.7.2 N L | 0,04 | 2,0 | 24-28 | 6-8 | 1-3 | 0,20N ¹⁾ Si |
| 25.9.3 Cu N L | 0,04 | 2,5 | 24-27 | 7-10 | 2-4 | ¹⁾ Si |
| 25.9.4 N L | 0,04 | 2,5 | 24-27 | 8-10 | 2-4 | ³⁾ Si |
| Fully austenitic, high corrosion resistance | | | | | | |
| 18.15.3 L | 0,04 | 1-4 | 16-19 | 14-17 | 2-3 | Si ¹⁾ |
| 18.16.5 N L | 0,04 | 1-4 | 17-20 | 15-19 | 3-5 | 0,20N ¹⁾ Si |
| Fully austenitic, high corrosion resistance (cont.) | | | | | | |
| 20.25.5 Cu N L | 0,04 | 1-4 | 19-22 | 24-27 | 4-7 | ⁴⁾ Si |
| 20.16.3 Mn N L | 0,04 | 5-8 | 18-21 | 15-18 | 2-3 | 0,20N ¹⁾ |
| 25.22.2 N L | 0,04 | 1-5 | 24-27 | 20-23 | 2-3 | 0,20N ¹⁾ |
| 7.31.4 Cu L | 0,04 | 2-5 | 26-29 | 30-33 | 3-4 | ⁵⁾ Si |
| Special | | | | | | |
| 18.8 Mn | 0,20 | 45-75 | 17-20 | 7-10 | - | - |
| 18.9 MnMo | 0,04-1,4 | 3-5 | 18-21 | 9-11 | 0,5-1 | ⁶⁾ Si |
| 20.10.3 | 0,10 | 2,5 | 18-21 | 9-12 | 1-3 | - |
| 23.12 L | 0,04 | 2,5 | 22-25 | 11-14 | - | - |
| 23.12 Nb | 0,10 | 2,5 | 22-25 | 11-14 | - | Nb |
| 23.12.2 L | 0,04 | 2,5 | 22-25 | 11-14 | 2-3 | - |
| 29.9 | 0,15 | 2,5 | 27-31 | 8-12 | - | - |
| Heat resisting | | | | | | |
| 16.8 Z | 0,08 | 2,5 | 14-16 | 7-9 | 1-2 | ¹⁾ Si |
| 19.9 H | 0,04-0,08 | 2,0 | 18-21 | 9-11 | - | - |
| 25.4 | 0,15 | 2,5 | 24-27 | 4-6 | - | - |
| 22.12 | 0,06-0,20 | 1-5 | 20-23 | 10-13 | - | - |
| 25.20 | 0,06-0,20 | 1-5 | 23-27 | 18-22 | - | - |
| 25.20 H | 0,35-0,45 | 2,5 | 23-27 | 18-22 | - | - |
| 18.36 | 0,25 | 2,5 | 14-18 | 33-37 | - | - |

Solid wire for :

EN ISO 17632-A

Classification of tubular electrodes for metal arc welding with or without a gas shield of non alloy and fine grain steels

T 50 5 1Ni PM 2 H5

Outershield 81Ni-H

Z = no requirement.
A = +20°C
O = 0°C
2 = -20°C
3 = -30°C
4 = -40°C
5 = -50°C
6 = -60°C

H_{DM} (ml/100g)
H5 = max.5
H10 = max.10
H15 = max.15

Welding positions

Type of shielding gas

Type of electrode core

Chemical composition

Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

Flux-cored wire

1. All positions
2. All positions except vertical down
3. Flat and horizontal-vertical butt / fillet weld
4. Flat butt and fillet weld
5. Vertical down and according to symbol 3

M = M2 mixed shielding gas (without helium)
C = 100 CO₂

Symbol Characteristics

With shielding gas (C and M2)

- R Rutile, slow freezing slag
- P Rutile, fast freezing slag
- B Basic
- M Metal powder

Without shielding gas

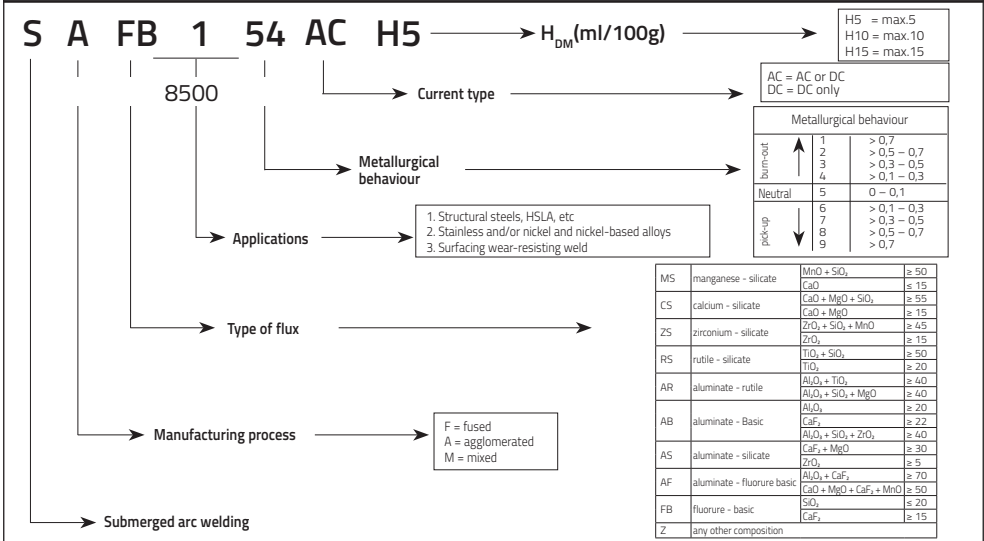
- V Rutile or basic / fluoride
- W Basic/fluoride, slow freezing slag
- Y Basic/fluoride, fast freezing slag
- S Other types

| Symbol | Yield | Tensile | A ₅ |
|--------|-------|---------|----------------|
| 35 | ≥ 355 | 440-570 | ≥ 22% |
| 38 | ≥ 380 | 470-600 | ≥ 20% |
| 42 | ≥ 420 | 500-640 | ≥ 20% |
| 46 | ≥ 460 | 530-680 | ≥ 20% |
| 50 | ≥ 500 | 560-720 | ≥ 18% |

| Symbol | Mn | Ni | Mo |
|--------|----------|----------|---------|
| - | 2,0 | - | - |
| Mo | 1,4 | - | 0,3-0,6 |
| MnMo | >1,4-2,0 | - | 0,3-0,6 |
| 1Ni | 1,4 | 0,6-0,12 | - |
| 2Ni | 1,4 | 1,8-2,6 | - |
| 3Ni | 1,4 | >2,6-3,8 | - |
| Mn1Ni | >1,4-2,0 | 0,6-0,12 | - |
| 1NiMo | 1,4 | 0,6-0,12 | 0,3-0,6 |
| Z | - | Other | - |

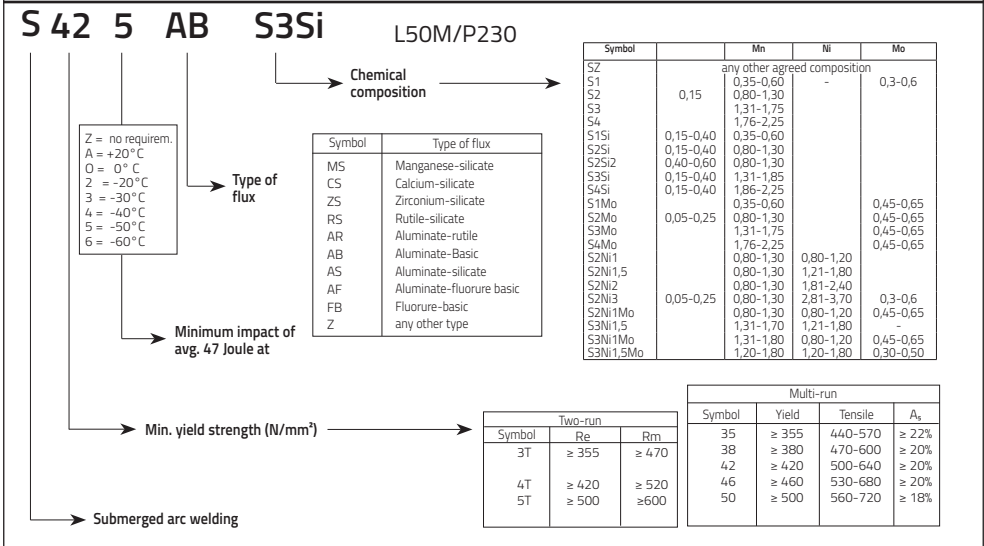
EN ISO 14174

Classification of flux for submerged arc welding



EN ISO 14171-A

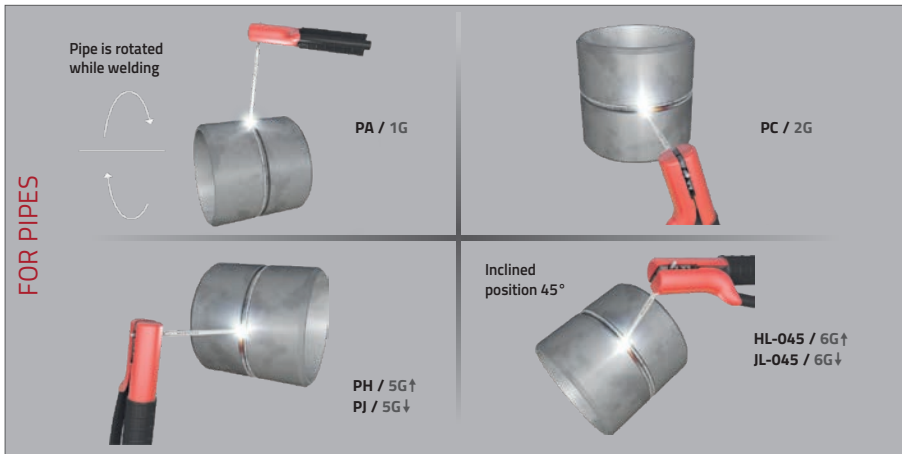
Classification of wire and wire/flux combinations for submerged arc welding of non alloy and fine grain steels



Some welding engineers prefer to use the standard AWS/ASME terminology for welding positions – some use a general description – some use a mixture of both!

It is useful in describing welding procedures if we all understand each other. This chart shows the basic AWS/ASME (and BS EN) welding positions, together with the outline descriptions. The AWS/ASME positions are described in ASME IX and the European terminology is used in BS EN 287-1 and defined in ISO 6947.

ASME (BS EN) POSITIONS



| Type | Field of application | Deposit in cm ³ per electrode | | |
|----------------------------|---|--|--------------------------------------|--------------|
| | | Ø 3.2 | Ø 4.0 | Ø 5.0 |
| Ferrod 135T Ferrod 160T | High recovery electrodes for fillet welds and horizontal V- and X-welds. Smooth weld appearance. High welding speed through high recovery of 135, 160 % | 4.7 | 7.1 8.5 | 11.6 14.2 |
| Ferrod 165A | As Ferrod 160T. Higher welding speed. 160% recovery. Impact properties at -20 °C | 5.1 | 8.5 | 12.7 |
| Universalis | Rutile type, especially for down hand fillet welding and filling in structural steel. Very smooth appearance. | 2.7 ¹ 3.5 ² | 3.9 ¹ 5.1 ² | |
| Cumulo | All positions fillet welding and filling f.i. for pipe welding (except vertical-down) | 2.5 | 3.5 | |
| Pantafix | Rutile all position electrode for most widely application. General construction, pipe welding, including vertical-down. | 2.4 | 3.4 | |
| Omnia | General purpose all position electrode. Low open circuit, small diameters for hobby market. | 2.4/2.4 | 3.4/3.4 | |
| Supra | All position rutile, excellent vertical down properties. Shipbuilding repairs. | 2.4 | 3.3 | 4.9 |
| Kardo | Basic electrode, low yield, low tensile, high impact. | 3.0 | 4.4 | |
| Baso 48SP | Rutile-basic electrode, excellent weldability, start and restart. | 3.0 | 5.3 | |
| Baso 100 | Basic electrode for welding under difficult conditions | 2.5 ¹ | 3.7 ¹ | 8.0 |
| Baso 120 | Basic electrode, 120% efficiency, for fast filling in all positions in difficult construction work | 2.9 ¹ 3.9 ² | 4.0 ¹ 5.8 ² | 9.1 |
| Baso G | Basic DC(arc) electrode, 120% efficiency, for fast filling in all positions. | 3.0 ¹ 3.9 ² | 4.5 ¹ 5.8 ² | 9.1 |
| Conarc 48 | Basic electrode, 130% efficiency, Very good notch toughness at low temperatures. | 3.2 ¹ | 4.9 ¹ 6.1 ² | |
| Conarc 49C | Basic electrode, 115% efficiency. Very good notch toughness at low temperatures. | 2.8 | 4.2 ¹ 6.1 ² | 8.5 |
| Conarc 51 | Basic electrode. All positions. Very good notch toughness at low temperatures | 2.2 | 3.4 | 9.8 |
| Conarc L150 | Basic electrode for horizontal fillet welds and filling. 150% efficiency | 4.9 | 7.5 | 11.6 |

Arc time in seconds per electrode

| Ø 3.2 | Ø 4.0 | Ø 5.0 |
|-----------------|------------------|-----------------|
| 75 | 65 | 68 |
| 85 | 92 | 86 |
| 90 | 90 | 78 |
| 57 ¹ | 55 ¹ | |
| 69 ² | 69 ² | |
| 66 | 62 | |
| 66 | 72 | |
| 59/65 | 59/72 | |
| 64 | 66 | 77 |
| 84 | 79 | |
| 75 | 95 | |
| 62 ¹ | 64 ¹ | 91 |
| 62 ¹ | 63 ¹ | |
| 74 ² | 85 ² | 99 |
| 70 ¹ | 75 ¹ | |
| 79 ² | 96 ² | 114 |
| 67 ¹ | 83 ¹ | 95 ² |
| 65 | 75 ¹ | |
| | 100 ² | 90 |
| 51 | 70 | 86 |
| 62 | 71 | 104 |

Weld metal volume per meter

| Fillet size "a" (mm) | Theoretical content (cm ³) | Formula: (a ² x L) "a"(mm) |
|----------------------|--|---------------------------------------|
| 3 | 9 | |
| 3.5 | 12.3 | |
| 4 | 16 | |
| 4.5 | 20.3 | |
| 5 | 25 | |
| 5.5 | 30.3 | |
| 6 | 36 | |
| 8 | 64 | |
| 10 | 100 | |

| Thickness "t" (mm) | Theoretical content (cm ³) | | | Formula: V50° : d (0.466d + v) L V60° : d (0.577d + v) L V70° : d (0.700d + v) L |
|--------------------|--|------|------|---|
| | V50° | V60° | V70° | |
| 6 | 35 | 39 | 43 | |
| 8 | 54 | 61 | 69 | |
| 10 | 77 | 88 | 100 | |
| 12 | 103 | 119 | 137 | |
| 14 | 133 | 155 | 179 | |
| 16 | 167 | 196 | 227 | |
| 18 | 205 | 241 | 281 | |
| 20 | 246 | 291 | 340 | |

| Thickness "t" (mm) | Theoretical content (cm ³) | | | Formula: X50° : d (0.233d + v) L X60° : d (0.228d + v) L X70° : d (0.350d + v) L |
|--------------------|--|------|------|---|
| | V50° | V60° | V70° | |
| 14 | 88 | 98 | 111 | |
| 16 | 108 | 122 | 138 | |
| 18 | 129 | 147 | 167 | |
| 20 | 153 | 175 | 200 | |
| 25 | 220 | 255 | 294 | |
| 30 | 300 | 349 | 405 | |
| 35 | 390 | 458 | 534 | |
| 40 | 493 | 581 | 680 | |

| Thickness "t" (mm) | Theoretical content (cm ³) | Formula: ((d-10) ² x 0,27 + 12d - 73) |
|--------------------|--|---|
| 20 | 194 | |
| 25 | 288 | |
| 30 | 395 | |
| 35 | 516 | |
| 40 | 650 | |

DETERMINATION OF WELDING COSTS

| | | |
|---|---|----------------------|
| weld content deposit per electrode | = | number of electrodes |
| price per electrode x number | = | costs of electrodes |
| number of electrodes x arc time | = | total arc time |
| total arc time x100 percentage duty cycle | = | total work time |
| total work time x hourly wage | = | wage costs |
| costs of electrodes + wage costs | = | total costs |

Note: the percentage of duty cycle depends on practical conditions, and may vary between 15-45%

1) L = 350mm

2) L = 450mm

Ferrite Number

To facilitate international communication (specifications, certifications), the internationally accepted term Ferrite Number (FN) has been introduced to indicate a delta-ferrite content in stainless steel weld metal.

The Ferrite Number is often used as an indicator of resistance to weld metal hot cracking. This aspect and other engineering properties have been correlated with the FN value of the weld metal. For various service conditions the following typical levels reflect good experiences:

- fully austenitic weld metal: FN < 0.5
- high corrosion resistance in severe oxidising and reducing acidic and chloride containing media: FN < 0.5
- fully austenitic CrNiMoN weld metal, non-magnetic: FN < 0.5
- low ferrite CrNiN and CrNiMoN weld metal, cryogenic applications: FN 3-6 or < 0.5
- general purpose stainless steel weld metal with corrosion resistance and high resistance to hot cracking and microfissures: FN 6-15
- buffer layer of austenitic/ferritic weld deposits for dissimilar joints and buffer layers in clad steel: FN 15-35
- austenitic/ferritic weld metal with high stress and pitting corrosion resistance as well as a balanced structure for toughness and corrosion: FN 30-70

Control of welding of constructions often requires the determination of the Ferrite Number (FN)

Ferrite Measurement

An internationally accepted standardised method to determine the ferrite content is based upon an arbitrarily defined relationship between a magnetic force and weld ferrite content. This is necessary because an absolute and correct determination of the ferrite content is not available as a result of inherent inaccuracy of metallographic examination and the nonexistence of a calibration method for the absolute ferrite content in stainless steel. The attracting force between a defined permanent magnet and weld metal, containing delta-ferrite is measured by means of a torsion balance. The values are in fact compared with the values obtained in measurements using the same magnet, attracting a carbon steel base plate with a non magnetic copper coating of a specified thickness. A calibration method provides the necessary linear relation. The principles are accepted as the international standard ISO 8249 and AWS A4.2-91. The European Standardization will adopt the ISO standard.

The range in the revised standards has been extended to 100FN (originally 0-28FN).

Coated thickness standards are available from the "U.S. National Institute of Standards and Technology" (NIST). A precision torsion balance or the commercially available "Magne Gage" (fig.3) are suitable for the determination of the Ferrite Number under laboratory conditions (horizontal position). A permanent magnet of defined dimensions and magnetic strength, according ISO 8249, shall be used.

Secondary standards for the checking and calibration of field equipment in the range 0-100FN are available from NIST.

Calculation of ferrite content

The ferrite content is estimated on the basis of calculation, using the as deposited weld metal chemical composition.

The Cr- and Ni-equivalent is plotted in diagrams, based on the metallographic studies, such as:

- the Schaeffler Diagram¹⁾, published in 1949, is considered as most suitable for a general picture of weld metal structures for a wide range of compositions, but not accurate for ferrite containing austenitic weld metals;
- the DeLong Diagram (1973)²⁾, widely used up to 1985, for a limited range of CrNi (Mo, N)-stainless steel weld metal grades;
- the WRC 1992 Constitution Diagram (1992), published by Kotecki and Siewert (1992)³⁾ has been based upon the WRC 1988 Constitution Diagram, earlier published by Siewert, McCowan and Olson⁴⁾ as a result of a review and of more than 950 weld metal sample analyses and FN determinations (including data from Lincoln Electric). For this diagram, a better accuracy has been reported due to the accurate determination of the effect of Mn, Si, C, N and Nb.
- Also reference is made to the ESPY Diagram⁵⁾ for the calculation of the ferrite content.

¹⁻⁵⁾ See References, p. 29

Application of Ferrite Diagrams

The various ferrite diagrams are suitable to estimate the Ferrite Number in weld metal. Ongoing verifications indicate that the new WRC 1992 Constitution Diagram provides the best estimate. The old Schaeffler diagram still provide useful information in a wide range of weld metal compositions. It provides guidelines for dissimilar joints and welding clad steel, calculation of composition and position of the diluted weld metal.

The following pages contain a reprint of a combination of the Schaeffler and the WRC 1992 Constitution Diagram (fig. 1) and the standard WRC 1992 Constitution Diagram on full scale (fig. 2). In using these diagrams for the estimation of weld metal structure, one should always take into account the effects of different welding conditions (temperature/time-cycles, welding parameters, surface effects) which usually influence FN values, compared with measurements on all weld metal deposit samples.

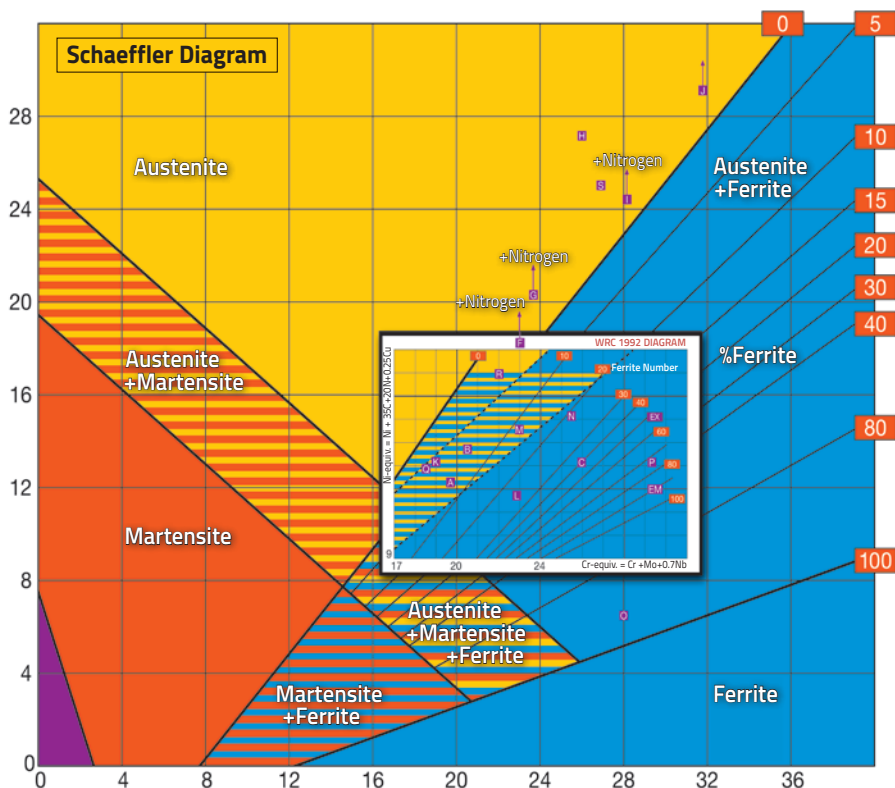


Fig. 1 Combined Schaeffler / WRC 1992 Constitution Diagram

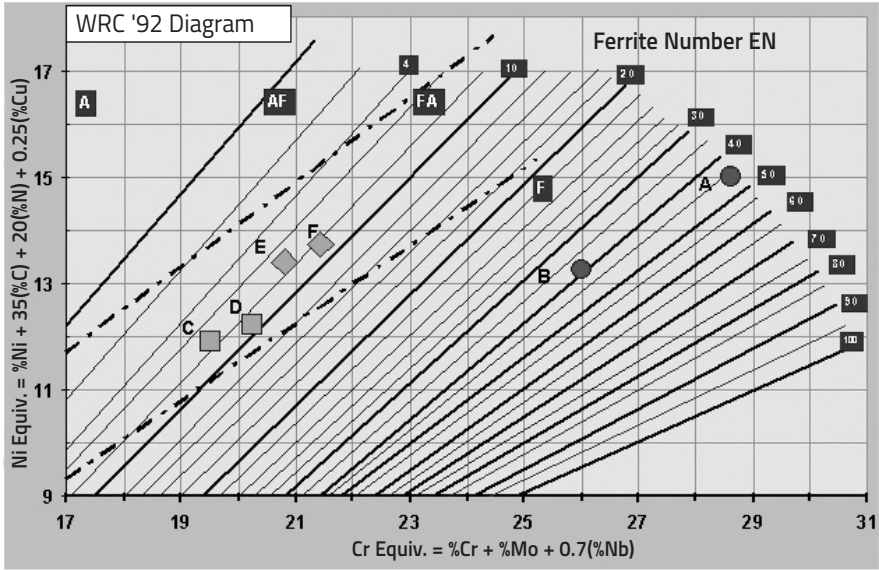


Fig. 2 WRC 1992 Constitution Diagram

Position of welding consumables

The position of representative Lincoln Electric Europe welding consumables (table 1) has been marked in the combined Schaeffler-WRC 1992 Diagram (figure 1) and in the original WRC Diagram.

Table 1 Cr- and Ni-equivalent, calculated according Schaeffler and the WRC'92 Constitution Diagram

| Ident | Product | WRC'92 | | Schaeffler | | Ident | Product | WRC'92 | | Schaeffler | |
|-------|-------------------|--------|-------|------------|-------|-------|---------------|--------|-------|------------|-------|
| | | Cr-eq | Ni-eq | Cr-eq | Ni-eq | | | Cr-eq | Ni-eq | Cr-eq | Ni-eq |
| A | Jungo Zeron® 100X | 28.6 | 15.0 | 29.1 | 10.5 | I | Jungo 4500 | 25.0 | 27.3 | 26.4 | 26.2 |
| B | Jungo 4462 | 26.0 | 13.3 | 26.9 | 10.9 | J | Jungo 4465 | 27.2 | 25.7 | 28.1 | 25.2 |
| C | Arosta 304L | 19.5 | 11.9 | 20.6 | 11.0 | K | NiCro 31/27 | 30.5 | 33.2 | 31.7 | 32.0 |
| D | Arosta 347 | 20.3 | 12.2 | 21.4 | 11.3 | L | Arosta 309S | 23.6 | 14.2 | 24.6 | 13.3 |
| E | Arosta 316L | 20.8 | 13.4 | 22.0 | 12.5 | M | Arosta 309Mo | 25.4 | 14.5 | 26.7 | 13.5 |
| F | Arosta 318 | 21.5 | 13.8 | 22.7 | 12.8 | N | Arosta 307 | 17.8 | 13.3 | 18.7 | 14.2 |
| G | Arosta 4439 | 22.6 | 21.3 | 23.8 | 18.2 | O | Arosta 329 | 25.4 | 8.6 | 27.2 | 7.4 |
| H | Jungo 4455 | 23.0 | 19.9 | 23.5 | 20.3 | P | Limarosta 312 | 28.8 | 13.9 | 30.3 | 12.7 |

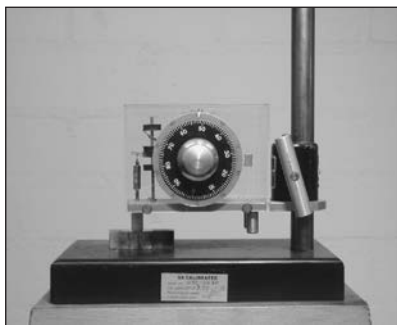


Fig. 3 Magne Gage

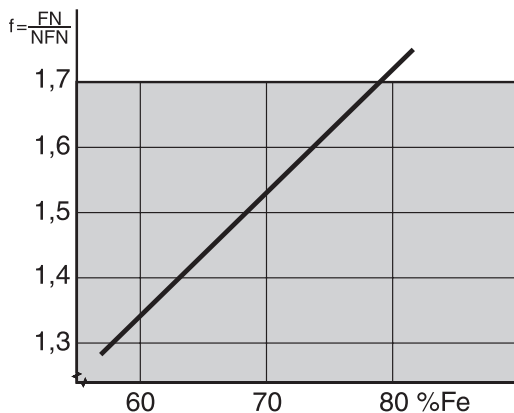


Fig. 4 Iron content versus factor f

Ferrite Number versus Ferrite Content

The Ferrite Number is not equal to the volumetric ferrite content (%). Although an absolute ferrite content can not be measured accurately, a reasonable estimate of the ferrite content can be made by dividing the Ferrite Number by the factor f (% ferrite = FN / f) which is dependant of the iron content in the weld metal as shown in figure 4.

Limitations

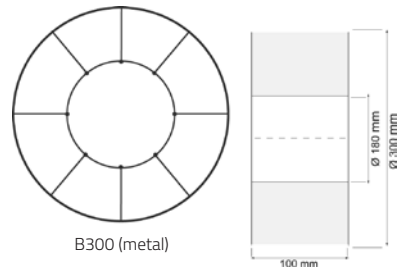
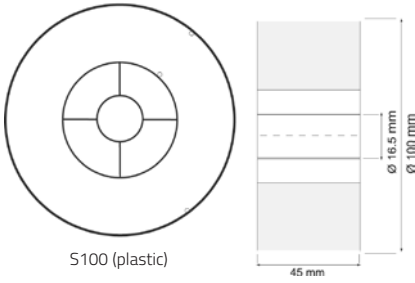
With the practice of measuring the Ferrite Number or ferrite content, welding conditions deviating from the standardised conditions have always to be taken into account. Furthermore, comparison tests showed that the accuracy between measurements in various laboratories may show differences up to +/- 10%.

Lincoln Electric laboratories

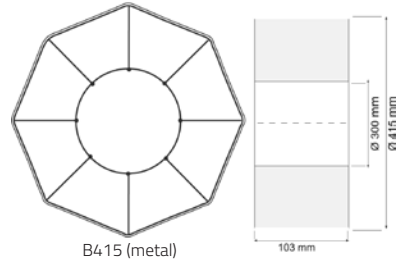
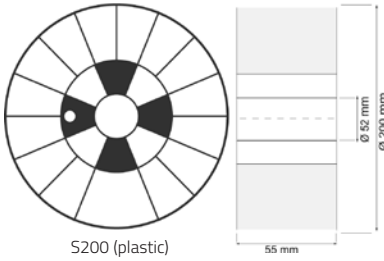
Since 1966 the Lincoln Electric R&D departments have always been involved in the international development of ferrite determinations. The laboratories are equipped with calibrated Magne Gages and on site measurement equipment. Primary coating thickness standards and secondary standards are available for contract calibration work.

References

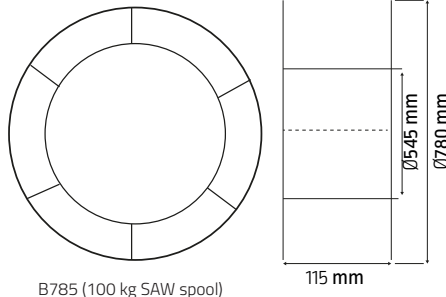
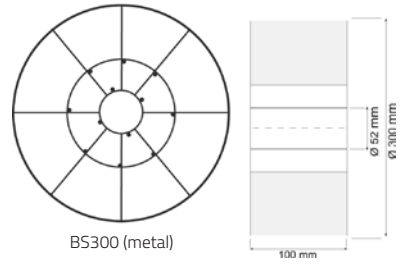
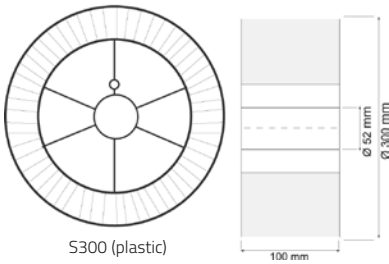
- 1) Schaeffler A.E., Metal Progress 56 (1949) p680-680s
- 2) DeLong W.T., Welding Journal 53 (1974) p273s-286s
- 3) Kotecki D.J., Siewert T.A., Welding Journal (1992) p171s-178s
- 4) Siewert T.A., McCowan C.N., Olson D.L., Welding Journal (1988) p289s-298s
- 5) Espy R.H., Welding Journal 61 (1982) p149s-156s



Adaptor : K10158
K10158-1 (plastic)



Adaptor : K299 (axis 25mm)
K1504-1 (axis 50mm)



Adaptor : K10410

AccuTrak®



GENERAL INFORMATION

FEATURES

- Drum structure done in resistant fiber carton
- Specifically designed retaining for easy pay off
- Approved Integrated Lifting Belts
- No hood needed
- Recyclable

Gem-Pak™



FEATURES

- Tangle Free - Prevents tangling and improves feedability
- Easy to Set-up - No external payoff devices required.
- Corrugated Cardboard Pallet - Fork-lift ready mini-pallet comes attached to the box for maximum portability and is 100% recyclable.

Wire Capacity (kg): 136



350 & 400 kg
SPEED FEED DRUMS



600 kg
SPEED FEED DRUMS



300/600/1000 kg
ACCUTRAK® DRUMS

| DRUMS | 350 kg Speed Feed | 400 kg Speed Feed | 600 kg Speed Feed | 300 kg Accutrak | 600 kg Accutrak | 1000 kg Accutrak |
|-------------------------------------|--|----------------------|----------------------|----------------------|--------------------|-----------------------|
| Wire Diameter (mm) | 1.6 to 4.8 | | | 1.6 to 2.0 | 1.6 to 2.4 | 1.6 to 4.8 |
| Wire grade | All including mild steel and low alloy | | | | | |
| Pallet load (kg) | 1400 | 800 | 600 | 600 | 600 | 1000 |
| Pallet dimension (mm) LxWxH | 1160 x 1160 x 1030 | 1200 x 800 x 1030 | 720 x 720 x 1051 | 1200 x 800 x 1030 | 720 x 720 x 1051 | 1000 x 1000 x 1000 |
| Drum dimension (mm) Diameter x H | 580 x 890 | | 720 x 720 x 1051 | 580 x 890 | 720 x 720 x 1051 | 1000 x 1000 x 1000 |
| Nb of pallets/container | 14 | N/A | 35 | N/A | 35 | 20 |
| Nb of drums/pallets | 4 | 2 | 1 | 2 | 1 | 1 |
| Turntable | AD1329-13 | | USE21000558 | - | - | - |
| Overseas transportation | yes | N/A | yes | N/A | yes | yes |



300/350 kg
METAL REEL



1000/1200 kg
LIFTABLE COIL

| COILS | 300/350 kg | 1000/1200 kg |
|-------------------------------|--|--------------|
| Wire Diameter (mm) | 1.6 to 4.8 | 1.6 to 4.8 |
| Wire grade | All including mild steel and low alloy | |
| Dimensions (mm) | 760x280 | 800x800x1125 |
| Pallet load (kg) | 900/1050 | 1000/1200 |
| Pallet dimension (mm) - LxWxH | 1200x800x1000 | 800x800 |
| Nb of pallets/container | 10 | 12 |
| Nb of units/pallets | 3 | 1 |
| Adaptor/turntable | - | 21000558 |
| Overseas transportation | yes | yes |

Sahara ReadyPack®: Warehouse and quiver in pocket format

Electrodes in Sahara ReadyPack® really save time and money. For these electrodes there is no need to store in a conditioned warehouse or to use redry ovens and quivers. This innovation on an industrial scale has been a success for many years now. Millions of the well known Sahara ReadyPack® have been consumed in ship building, chemical industry and in offshore projects. The moisture resistant vacuum packaging fits well with the advantages of the remarkable EMR-Sahara® concept. EMR-Sahara® covered electrodes are designed to be low in moisture and show a very low moisture absorption. The internationally (IIV) agreed moisture resistance test demonstrates that the electrodes remain, after exposure during 24 hours at 27°C and 70% R.H., below a maximum hydrogen content of 5 ml/100g which is the criterium to call the electrodes MR: moisture resistant. Even more important is the fact that the electrodes can be consumed from an opened Sahara ReadyPack® within 12 hours, and still prove to produce a weld deposit with a very low in hydrogen content (HDM < 5 ml/100g). For a number of EMR-Sahara® electrodes the maximum HDM level is even 3 ml/100g.

A Sahara ReadyPack® actually replaces the functions of a conditioned warehouse and a redry oven, all in pocket format. Storage in a conditioned warehouse is no longer needed; most efficient is a small storage room at the job site. The use of a redry oven is not recommended. Up to the moment you open the Sahara ReadyPack®, and during the following period of 12 hours, EMR-Sahara® electrodes keep their initial quality. The convenient packages are easily carried to the welding place. The content of one or two package is usually good for one working day. A real cost saving is demonstrated in many cases, mainly because maintenance of quivers and quality control on redrying procedures is no longer needed. Not to mention the loss of unproductive time in transportation from the redry oven to the job site. The reliable Sahara ReadyPack® has indeed set a trend in the welding industry.

Properties of the Sahara ReadyPack® and its content, the EMR-Sahara® (basic) electrodes in summary:

- Diffusible hydrogen level HDM less than 5 ml/100g; a new generation provides even less than 3 ml/100g
- Low moisture pick-up of the EMR-Sahara electrode coating; 12 hours after opening of the Sahara ReadyPack® still provides electrodes with a hydrogen content of maximum 5 and 3 ml/100g respectively
- Storage does not need a conditioned warehouse
- Intermediate storage in a dry cabinet or quiver is not needed, even not recommended
- No mix-up of electrodes, as may happen with electrodes outside the packaging for redrying
- A most efficient handling procedure; cost savings can easily be calculated.

The range of electrodes in the Sahara ReadyPack®

Currently the following moisture resistant very low hydrogen electrodes (basic EMR-Sahara® electrodes) can be supplied in Sahara ReadyPack®:

| Type | H _{DM} max. 5 ml/100 g | H _{DM} max. 3 ml/100 g |
|-------------|------------------------------------|------------------------------------|
| Baso G | | * |
| Conarc 49C | | * |
| Conarc 51 | | * |
| Conarc L150 | * | |
| Kardo | | * |
| Conarc 55CT | | * |
| Conarc 60G | | * |
| Conarc 70G | | * |
| Conarc 80 | | * |
| Conarc 85 | | * |
| SL12G | * | |
| SL19G | * | |
| SL20G | * | |
| SL22G | * | |

| Type | H _{DM} max. 5 ml/100 g | H _{DM} max. 3 ml/100 g |
|----------------|------------------------------------|------------------------------------|
| Kryo 1 | | * |
| Kryo 1P | | * |
| Kryo 1-180 | | * |
| Kryo 2 | | * |
| Kryo 3 | | * |
| Kryo 4 | | * |
| Arosta 304L | | |
| Arosta 316L | | |
| Arosta 4462 | | |
| Jungo 4462 | | |
| Limarosta 304L | | |
| Limarosta 3095 | | |
| Limarosta 312 | | |
| Limarosta 316L | | |
| Nyloid 2 | | |

1. Scope

Covered arc welding electrodes, manufactured by Lincoln Electric Europe, delivered in their original packaging.

The packaging consists of either:

- A cardboard boxes in outer carton;
- B foil protected cardboard boxes in outer carton;
- C plastic (PE) boxes with sealed cap, suitable for reclosing;
- D hermetically sealed metal tin (LINC CAN™) in outer carton;
- E hermetically vacuum sealed aluminium foil packs Sahara ReadyPack® (SRP) in outer carton.;
- F hermetically vacuum sealed foil packs (Protech®, VPMD- Vacuum Pack Medium, VPMD- Vacuum pack Micro) in outer carton.

| Electrode grades | Packaging type | | | | | |
|--|----------------|---|---|---|---|---|
| | A | B | C | D | E | F |
| Mild steel | X | X | X | X | | X |
| Low alloy high strength steel | | X | | X | | X |
| Low temperature fine grain steel | | X | | X | X | X |
| Creep resistant steel | | X | | | | X |
| Stainless steel | | X | X | X | X | X |
| Duplex and Superduplex stainless steel | | X | | | | X |
| Nickel base electrodes | | | X | | | X |
| Hardfacing-; maintenance and repair electrodes | | | X | | | |

2. Storage

2a. Storage of electrodes in cardboard boxes requires humidity and temperature controlled storage areas.

General recommended storage conditions include:

- temperature 17-27°C, relative humidity ≤60%
- temperature 27-37°C, relative humidity ≤50%.
- electrode boxes may be stored in layers to a maximum of 7.

2b. Plastic boxes require storage conditions suitable to cardboard boxes

2c. No temperature and humidity requirements are applicable for electrodes in Linc-Can Mini-Pack and Sahara ReadyPacks, providing that (vacuum) seal is present in undamaged packs.

General recommended storage conditions include:

- Sahara ReadyPacks & Mini-Pack in outer cartons may be stored in layers to a maximum of 7;
- Linc Can in outer boxes may be stored in layers to a maximum of 5;
- Prevent damage and heating above 60°C for Linc-Can and Sahara ReadyPacks;
- Prevent damage and heating above 40°C for Mini-Pack.

3. Handling

3a. Re-drying and subsequential holding, as recommended in table 1, is required for products in the following conditions

- rutile electrodes, being humidified for any reason;
- basic low hydrogen electrodes in cardboard boxes;
- basic low hydrogen electrodes, returned from shop floor or damaged Sahara ReadyPacks, Mini-Pack or Linc Can;
- stainless steel and Ni-base electrodes after long and unknown storage conditions (deviating from recommendations);
- Wearshield electrodes in plastic (PE) boxes, stored for more than 1 year under conditions as described under section 2a. or earlier when the condition deviates from those recommended.

3b. Electrodes in Sahara ReadyPack and Linc-Can can be used without re-drying, providing that vacuum or seal is present in the undamaged packaging. The electrodes can be consumed in the as received condition, direct from the packaging within a period of 8 hours after opening under the conditions of ≤35°C and ≤90% RH, with the electrodes remaining in the opened packaging and protected against excessive conditions as condensation, rain, etc. This time can be extended to 12 hours under the conditions of ≤27°C and ≤70% RH. Once opened Linc-Cans should be closed during welding operations using the plastic lid that is supplied with the tin. If vacuum or seal is not present, the electrodes shall follow the re-dry and holding procedure as recommended in table 1 for the EMR-Sahara® Range. Electrodes in Mini-Pack can be used without re-drying, provided that the vacuum is present in the undamaged packaging. The electrodes can be consumed in the as received condition, direct from the packaging within a period of 4 hours after opening under the conditions of ≤35°C and ≤90% RH, with the electrodes remaining in the opened packaging and protected against excessive conditions as condensation, rain, etc.

REDRYING AND HOLDING RECOMMENDATIONS

The re-drying time / temperature listed in Table 1, is a general guideline. Specific individual re-drying instructions on the product label may differ.

Table 1. Covered electrode re-dry times and temperatures

| Electrode product groups | Re-drying time (h)* | Temp. (°C) | Holding |
|---|---------------------|--------------------|---|
| Mild steel: - rutile E6013 - rutile E6012, E7024 | 0.5-1h 1-2h | 70-80 100-120 | Cabinet 10-20°C above ambient temperature |
| - basic, low hydrogen (HDM <8 ml/100g) - basic, very low hydrogen* | 2-6h 2-6h | 250-375 325-375 | a. Holding oven max. one year at 120-180°C b. Quiver max. 10h at RT-125°C (see illustration fig. 1) c. Plastic (PE) box max. 2 weeks workshop conditions |
| Low alloy: - basic, very low hydrogen** | 2-6h | 325-375 | |
| Hardfacing-; maintenance & repair electrodes | | | |
| Stainless steel: - non EMR-SAHARA electrodes - EMR-SAHARA range | 1-6h 1-6h | 200-300 125-300 | Holding oven unlimited time at 75-125°C quiver max. 10h at RT-125°C |
| Ni-base | 1-6h | 200-300 | |

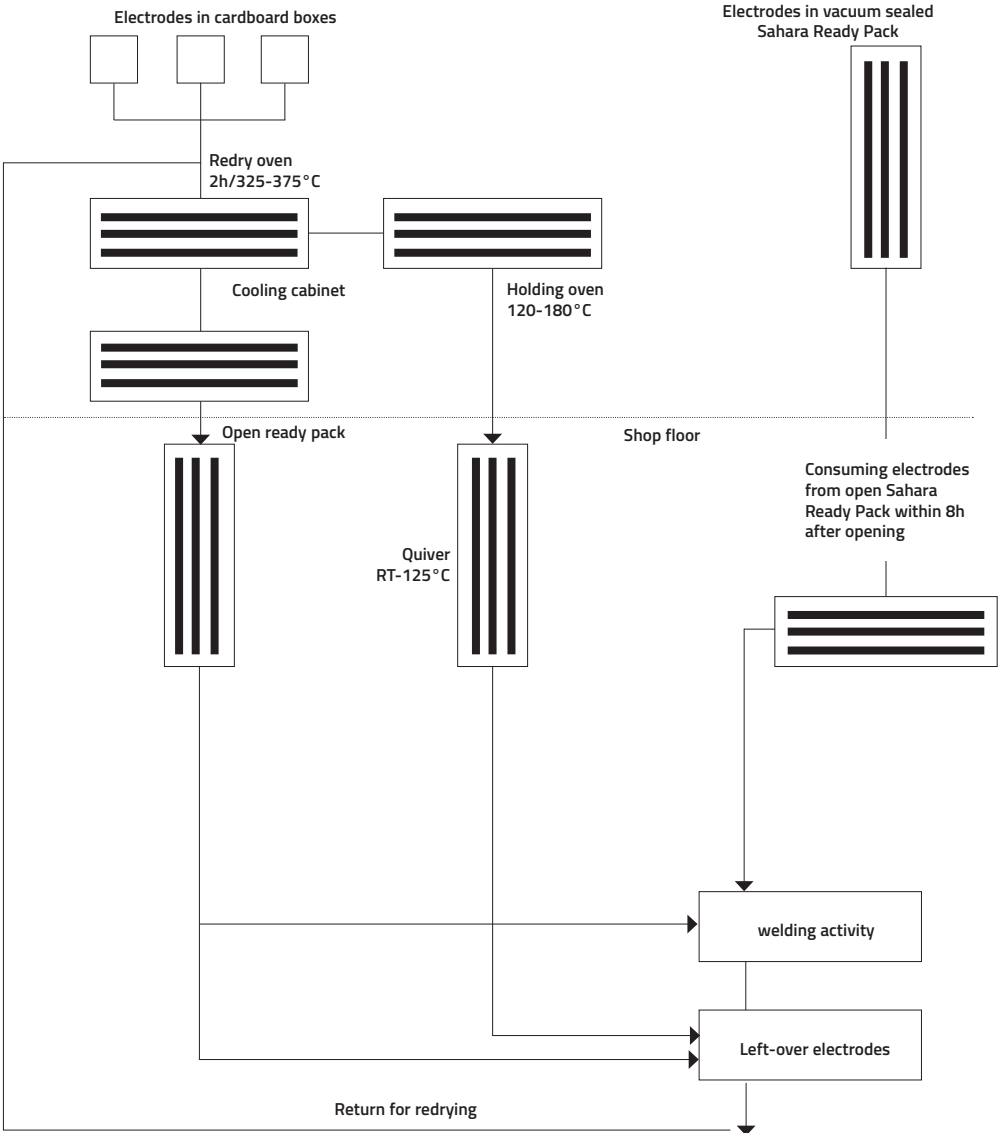
* Re-drying can be repeated twice within the indicated max. time of 6h. Re-drying of electrodes should be carried out by taking them out of the packaging and place the electrodes in approx. 3 cm thick layers in a temperature controlled air-circulation oven.

** If these EMR-SAHARA, vacuum packing electrodes are re--dried a maximum content HDM of ≤5ml/100g is valid.

4. Deteriorated product

Covered electrodes that have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods of time cannot be restored in their original condition and should be discarded.

Figure 1: Recommended handling procedure of EMR-SAHARA® electrodes after removal either from a regular cardboard box or vacuum sealed Sahara ReadyPack®



FLUX-CORED WIRES

1. Scope

Tubular cored wires with the following trade names are supplied in various spooling and packaging

| Product family | Packaging |
|---|--|
| Gas shielded mild steel and low alloyed flux and metal cored wires. | <ul style="list-style-type: none"> - spool in plastic bag in cardboard box - spool in Al/PE vacuum packaging in cardboard outer box - spool in plastic protection on pallet - Accutrak® drums - spool in cardboard box or plastic bucket or hermetically sealed cans - spool in plastic bag in cardboard box |

2. Storage

Exposure to a humid environment with only a relative thin plastic foil shall be prevented.

Tubular wire, packed in the original foil and cardboard box or drum require controlled warehouse conditions such as:

- temperature 17-27°C, relative humidity: ≤60%;
- temperature 27-37°C, relative humidity: ≤50%.

INNERSHIELD wires in plastic buckets or in hermetically sealed cans and OUTERSHIELD as well as COR-A-ROSTA in Al/PE bags under vacuum, if applicable, do not require measures against moisture pick-up. Damage of the packaging shall be prevented.

3. Handling

3a. OUTERSHIELD, INNERSHIELD xxx-H types and COR-A-ROSTA

Spools outside the protective packaging allow exposure to normal workshop conditions during ≤72 hours.

Drums fitted with the original lid or recommended drum hood allow exposure to normal workshop conditions during 2 weeks

3b. INNERSHIELD, non xxx-H types:

Spools outside the protective packaging allow 2 weeks exposure to normal workshop conditions.

In all cases the products require protection against contamination with moisture, dirt and oil products. During interruption of the production process for more than 8 hours, wire spools shall be stored in their plastic bag in the above-mentioned storage conditions.

4. Deteriorated product

Cored electrode products that are rusty, have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods of time cannot be restored in their original condition and should be discarded.

MIG WIRES & TIG RODS

1. Scope

Solid wires and rods can be supplied in various packaging units in tubes, spools and drums.

2. Storage

Exposure to a humid environment shall be prevented.

The following storage conditions are recommended.

Solid wire in the original packaging require controlled warehouse conditions such as:

- temperature 17-27°C, relative humidity ≤60%
- temperature 27-37°C, relative humidity ≤50%

3. Handling

Rods and spools outside the protective packaging allow 2 weeks of exposure to normal workshop conditions.

In all cases, the products require protection against contamination with moisture, dirt and oil products.

During interruption of the production process for more than 8 hours, wire spools shall be stored in their plastic bag in the above mentioned storage conditions. Damage of packaging should be avoided

4. Deteriorated product

Products that are oxidized, have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods, cannot be restored in their original condition and should be discarded.

FLUX

1. Scope

Welding fluxes are supplied in plastic bags, bulk bags, Sahara ReadyBags, Drybags, Bigbag Dry and metal drums

2. Storage

The following storage conditions are recommended:

Welding fluxes, packed in plastic bags, require controlled warehouse conditions such as:

- temperature 17-27 °C, relative humidity: ≤60%
- temperature 27-37 °C, relative humidity: ≤50%

Product in metal drums, Sahara ReadyBags, Drybags and Bigbag Dry does not require special storage conditions but rust and damage of the packaging shall be prevented.

3. Handling

Product characteristics as specified for the original condition, are retained if the product is treated in accordance with the following recommendations:

| Packaging | Storage conditions | |
|---------------------------------------|--|--|
| | 0-6 months, temperature ≤37 °C or rel. humidity <50% | >6 months or temperature >37 °C or relative humidity 50-90%* |
| Plastic bags | use as is** | redry 1-2h / 300-375 °C |
| Sahara ReadyBag / Drybag / Bigbag Dry | use as is | use as is |
| Metal drums | use as is | use as is |

* if storage conditions include a relative humidity over 90% the flux may have been deteriorated so that re-drying becomes ineffective.

** if a severe application is considered (HAZ or weld metal hardness HV10 >350, heavy restraint, etc.) re-drying 1-2h / 300-375 °C is recommended.

For MIL800-H, MIL800-HPNi and 842-H fluxes Follow all previous procedures, with the following changes:

- Set temperature between 120°-205°C.
- For ovens in which heating rods are inserted into the flux, do not let the temperature of flux adjacent to the rods exceed 205°C. Re-drying is carried out with the product removed from the original packaging and treated in an oven with an even temperature. It is recommended to have either an oven atmosphere circulation over a maximum flux height of 3 cm or to have the flux moving. The re-drying operation can be repeated to a maximum of 4 times. Re-dried flux and flux handled in the welding operation, shall be kept dry, preferably at a temperature of 50-120 °C above ambient temperature, time unlimited.

4. Deteriorated product

Welding fluxes that have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods of time cannot be restored in their original condition and should be discarded

5. Recycling

Non consumed flux collected from the weld shall be cleaned from slag, metal and/or other contamination. Damage of the flux by heavy impingement in the transport system shall be prevented. Prevent separation of the different grain fraction in cyclones or in "dead" corners. Add new flux in the hopper in a circulation system before a level of 25% of the full hopper is reached.

SHELF LIFE FOR ALL CONSUMABLES

Shelf life indicates how long our goods can be stocked at customer's premises and is not an integration to warranty.

Shelf life for all consumables is 3 years, with two exceptions described below, provided storage and handling conditions are met,

- for consumables with vacuum packing, shelf life can be extended to 5 years
- for Al (alloy) consumables, the shelf life is limited to 1 year.

Individual products might have a longer shelf life, but as standards or formulas might change, we do not extend shelf life.

MMA CONSUMABLES

STICK ELECTRODES

MILD STEEL, CELLULOSIC

| | |
|-----------------------|----|
| Lincoln® 6010 | 40 |
| Fleetweld® 5P+® | 41 |

MILD STEEL, RUTILE

| | |
|--------------------|----|
| Cumulo..... | 42 |
| Numal..... | 43 |
| Omnia® | 44 |
| Omnia® 46..... | 45 |
| Pantafix | 47 |
| Supra® | 48 |
| Universalis® | 49 |

MILD STEEL, RUTILE HIGH RECOVERY

| | |
|--------------------|----|
| Ferrod® 135T..... | 50 |
| Ferrod® 160T..... | 51 |
| Ferrod® 165A | 52 |

MILD STEEL, BASIC

| | |
|----------------------|----|
| Basic 7018..... | 53 |
| Basic 7018P | 54 |
| Baso® 120 | 55 |
| Baso® 48SP | 56 |
| Baso® G..... | 57 |
| Conarc® 48 | 59 |
| Conarc® 49 | 60 |
| Conarc® 49C..... | 61 |
| Conarc® 50 | 62 |
| Conarc® ONE..... | 63 |
| Hyrod 7018 | 64 |
| Hyrod 7018LT | 65 |
| Kardo | 66 |
| Lincoln® 7018-1..... | 67 |
| Vandal | 69 |

MILD STEEL, BASIC, HIGH RECOVERY

| | |
|--------------------|----|
| Conarc® L150 | 70 |
| Hyrod 7028 | 71 |

MILD STEEL, DOUBLE COATED

| | |
|-----------------------|----|
| Lincoln® 7016/DR..... | 72 |
|-----------------------|----|

MILD STEEL, PIPELINE APPLICATIONS

| | |
|---------------------|----|
| Pipelinor® 16P..... | 73 |
| Baso® 100 | 74 |
| Conarc® 51 | 75 |

LOW ALLOY STEEL, CELLULOSIC

| | |
|------------------------|----|
| Lincoln® 7010 | 76 |
| Lincoln® 8010 | 77 |
| Pipelinor® 7P+..... | 78 |
| Pipelinor® 8P+..... | 79 |
| Shield-Arc® 70+..... | 80 |
| Shield-Arc® HYP+ | 81 |

LOW ALLOY STEEL, HIGH STRENGTH

| | |
|-------------------|----|
| Conarc® 60G | 82 |
| Conarc® 70G | 83 |

LOW ALLOY STEEL, LOW TEMPERATURE

| | |
|-------------------|----|
| Kryo® 1 | 84 |
| Kryo® 1-180 | 85 |
| Kryo® 1P | 86 |
| Kryo® 1R | 87 |
| Kryo® 2 | 88 |
| Kryo® 3 | 89 |
| Kryo® 4 | 90 |

LOW ALLOY STEEL, HIGH TEMPERATURE

| | |
|-------------|----|
| SL 12G..... | 91 |
| SL 22G..... | 92 |

LOW ALLOY STEEL, WEATHERING STEELS

| | |
|--------------------|----|
| Conarc® 55CT | 93 |
|--------------------|----|

STAINLESS STEEL, STANDARD AUSTENITIC

| | |
|------------------------|-----|
| Arosta® 304L..... | 94 |
| Arosta® 307 | 95 |
| Arosta® 309S | 96 |
| Arosta® 316L..... | 97 |
| Clearosta® E 304L..... | 98 |
| Clearosta® E 309L..... | 99 |
| Clearosta® E 316L..... | 100 |
| Limarosta® 304L..... | 101 |
| Limarosta® 309S..... | 102 |
| Limarosta® 316L..... | 103 |
| LINOX 308L..... | 104 |
| LINOX 309L..... | 105 |
| LINOX 316L..... | 106 |
| LINOX P 308L..... | 107 |
| LINOX P 309L..... | 108 |
| LINOX P 316L..... | 109 |

ALUMINIUM

| | |
|--------------|-----|
| ALMN..... | 110 |
| ALSI 5 | 111 |
| ALSI 12..... | 112 |

MMA
CONSUMABLES
STICK
ELECTRODES

Lincoln® 6010

TOP FEATURES

- Used for root and hot passes as well as filling and capping up to X52 Grades
- Also used for root passes on higher-strength pipe steels, up to X80
- When root pass welding, negative polarity is recommended
- Excellent weldability in all positions

CLASSIFICATION

AWS A5.1 E 6010
EN ISO 2560-A E 38 3 C 21

CURRENT TYPE

DC+/DC-

WELDING POSITIONS

All positions

APPROVALS

| ABS | LR | DNV | TÜV |
|-----|----|-----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|-----|-----|-----|
| 0.1 | 0.6 | 0.2 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -30°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥380 | 470-560 | ≥24 | ≥47 |

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 40-80 |
| 3.2 x 350 | 60-110 |
| 4.0 x 350 | 90-140 |
| 5.0 x 350 | 110-170 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CAN | 555 | 9.0 | 627257 |
| 3.2 x 350 | CAN | 355 | 9.5 | 627258 |
| 5.0 x 350 | CAN | 158 | 9.5 | 627260 |

Fleetweld® 5P+

TOP FEATURES

- Deep arc penetration
- Light slag with minimal arc interference
- Excellent vertical and overhead capability

TYPICAL APPLICATIONS

- Cross country and in-plant pipe welding
- Steel with moderate surface contaminants
- Square edge butt welds
- Welding on galvanized and specially coated steels

CLASSIFICATION

AWS A5.1 E6010

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|------|------|
| 0.20 | 0.56 | 0.17 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°C/-30°C |
|--------------------|------------|----------------------|------------------------|----------------|------------------------------|
| Required: AWS A5.1 | AW | min. 330 | min. 430 | min. 22 | min. 27 |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | | 471 | 586 | 24 | 56 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 300 | 40-70 |
| 3.2 x 350 | 65-130 |
| 4.0 x 350 | 90-175 |
| 5.0 x 350 | 140-225 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|--------------------|
| 2.4 x 300 | CAN | - | 22.7 | ED010283, ED032564 |
| 3.2 x 350 | CAN | - | 22.7 | ED010278, ED032565 |
| 4.0 x 350 | CAN | - | 22.7 | ED010285, ED032566 |
| 4.8 x 350 | CAN | - | 22.7 | ED010281 |

CUMULO

TOP FEATURES

- Excellent for pipe welding and construction work
- Smooth side wall wetting
- Good X-ray soundness

CLASSIFICATION

AWS A5.1 E 6013
EN ISO 2560-A E 38 0 R 12

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|-----|-----|
| 0.08 | 0.6 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|------|
| | | | | | 0°C | 10°C |
| Required: AWS A5.1 | | min. 330 | min. 430 | min. 17 | not specified | |
| EN ISO | | min. 380 | 470-600 | min. 20 | min. 47 | |
| Typical values | AW | ≥ 420 | 500-600 | ≥ 24 | ≥ 60 | ≥ 47 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 70-95 |
| 3.2 x 350 | 100-135 |
| 4.0 x 350 | 130-190 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 114 | 2.1 | 588601-1 |
| 3.2 x 350 | CBOX | 155 | 4.8 | 588602-1 |
| 4.0 x 350 | CBOX | 105 | 4.8 | 588603-1 |

NUMAL

TOP FEATURES

- Applicable for "clean" structural steel
- Smaller diameters excellent for hobby market
- Very suitable for low open circuit voltage transformers (min. OCV 42 V)

CLASSIFICATION

AWS A5.1 E 6013
EN ISO 2560-A E 38 0 R 11

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All positions

APPROVALS

| ABS | LR | BV | DNV |
|-----|----|----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|-----|------|
| 0.06 | 0.5 | 0.45 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) 0°C |
|--------------------|------------|----------------------|------------------------|----------------|----------------------|
| Required: AWS A5.1 | | min. 331 | min. 414 | min. 17 | not specified |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | 430 | 480 | 26 | 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 70-90 |
| 3.2 x 350 | 90-125 |
| 4.0 x 350 | 140-190 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOX | 405 | 4.2 | 609257 |
| 2.5 x 350 | CBOH | 110 | 2.1 | 609179-1 |
| | CBOX | 250 | 4.8 | 609175 |
| 3.2 x 350 | CBOH | 75 | 2.3 | 609180-1 |
| | CBOX | 175 | 5.3 | 609176 |

Omnia®

TOP FEATURES

- Excellent all positional operating characteristics, especially vertically-down and the arc characteristics ensures reliable penetration
- Good gap bridging and easy striking and restriking

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 RC 11

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All positions

APPROVALS

| ABS | LR | BV | DNV |
|-----|----|----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|--------|--------|
| 0.08 | 0.5 | 0.3 | ≤ 0.03 | ≤ 0.03 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|--------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.1 | | min. 330 | min. 430 | min. 17 | not specified |
| EN ISO | | min. 380 | 470-600 | min. 22 | min. 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-85 |
| 3.2 x 350 | 90-130 |
| 4.0 x 350 | 140-180 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 127 | 2.1 | 588683-1 |
| 3.2 x 350 | CBOX | 156 | 4.4 | 588684-1 |
| 4.0 x 350 | CBOX | 105 | 4.5 | 588685-1 |

Omnia® 46

TOP FEATURES

- Suitable for general construction work
- Smaller diameters excellent for hobby market
- Very suitable for low open circuit voltage transformers (min. OCV 42 V)

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 R 11

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All positions

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|-----|------|
| 0.06 | 0.5 | 0.45 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) 0°C |
|--------------------|------------|----------------------|------------------------|----------------|----------------------|
| Required: AWS A5.1 | | min. 330 | min. 430 | min. 17 | not specified |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | 460 | 540 | 27 | 65 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.0 x 300 | 50-60 |
| 2.5 x 350 | 70-90 |
| 3.2 x 350 | 90-125 |
| 3.2 x 450 | 100-135 |
| 4.0 x 350 | 140-190 |
| 4.0 x 450 | 150-200 |
| 5.0 x 450 | 180-240 |

Omnia® 46

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 1.6 x 250 | LINCPACK | 140 | 0.8 | 599993-1 |
| 2.0 x 300 | LINCPACK | 94 | 1.0 | 609068 |
| | CBOX | 374 | 4.0 | 609059-1 |
| 2.5 x 300 | CBOX | 250 | 4.2 | 609060-I |
| | LINCPACK | 52 | 1.0 | 609070 |
| 2.5 x 350 | CBOH | 110 | 2.1 | 800358-1 |
| | CBOX | 250 | 4.8 | 609060 |
| | LINCPACK | 33 | 1.0 | 609093 |
| 3.2 x 350 | CBOH | 75 | 2.3 | 800372-1 |
| | CBOX | 175 | 5.3 | 609061 |
| | CBOX | 150 | 6.2 | 609062 |
| 4.0 x 350 | CBOX | 102 | 5.0 | 609063 |
| 4.0 x 450 | CBOX | 93 | 5.9 | 609064 |
| 5.0 x 450 | CBOX | 56 | 5.8 | 609065 |

MMA

Pantafix

TOP FEATURES

- Medium thick rutile-cellulosic coated MMA electrode for structural steelwork
- Suitable on primer painted and slightly rusted parts, as there is a high tolerance to impurities.
- Suitable for welding galvanised steel components.
- Excellent all positional operating characteristics, especially vertically-down and the arc characteristics ensures reliable penetration.
- Good gap bridging and easy striking and restriking

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 RC 11

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All positions

APPROVALS

| ABS | BV | DNV |
|-----|----|-----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|--------|--------|
| 0.08 | 0.5 | 0.3 | ≤ 0.03 | ≤ 0.03 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20 °C |
|--------------------|------------|----------------------|------------------------|----------------|-------------------------|
| Required: AWS A5.1 | | min. 330 | min. 430 | min. 17 | not specified |
| EN ISO | | min. 380 | 470-600 | min. 22 | min. 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-85 |
| 3.2 x 350 | 90-130 |
| 4.0 x 350 | 140-180 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 127 | 2.1 | 588691-1 |
| 3.2 x 350 | CBOX | 156 | 4.4 | 588692-1 |
| 4.0 x 350 | CBOX | 105 | 4.5 | 588693-1 |

Supra®

TOP FEATURES

- Excellent on painted or rustcovered steel
- Recommended for bridging wide gaps
- Weldable in all positions with one current setting

CLASSIFICATION

AWS A5.1 E 6012
EN ISO 2560-A E 38 0 RC 11

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All positions

APPROVALS

| LR | BV | DNV | TÜV | DB |
|----|----|-----|-----|----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|-----|-----|
| 0.12 | 0.5 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) 0° C |
|--------------------|------------|----------------------|------------------------|----------------|-----------------------|
| Required: AWS A5.1 | | min. 330 | min. 430 | min. 17 | not specified |
| EN ISO | | min. 380 | 470-600 | min. 20 | min. 47 |
| Typical values | AW | 470 | 550 | 23 | 56 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 70-90 |
| 3.2 x 350 | 95-130 |
| 4.0 x 350 | 130-170 |
| 5.0 x 350 | 170-250 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 110 | 2.1 | 588694-1 |
| 3.2 x 350 | CBOX | 165 | 4.8 | 588695-1 |
| 4.0 x 350 | CBOX | 115 | 4.9 | 588696-1 |
| 5.0 x 350 | CBOX | 74 | 4.9 | 588697-1 |

Universalis®

TOP FEATURES

- Self releasing slag
- Very smooth appearance
- Smaller sizes (2.0 & 2.5 mm) most versatile for thin plate material

CLASSIFICATION

AWS A5.1 E 6013
EN ISO 2560-A E 42 0 RR 12

CURRENT TYPE

AC/DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|-----|------|
| 0.08 | 0.6 | 0.45 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) 0°C |
|--------------------|------------|----------------------|------------------------|----------------|----------------------|
| Required: AWS A5.1 | | min. 330 | min. 430 | min. 17 | not specified |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | 480 | 560 | 26 | 50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 65-90 |
| 3.2 x 350 | 100-140 |
| 3.2 x 450 | 100-140 |
| 4.0 x 450 | 150-195 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 105 | 2.1 | 588699-1 |
| 3.2 x 350 | CBOX | 125 | 4.3 | 588700-1 |
| 4.0 x 450 | CBOX | 78 | 5.6 | 588702-1 |

Ferrod® 135T

TOP FEATURES

- High welding speed
- Smooth weld appearance
- Self releasing slag

CLASSIFICATION

AWS A5.1 E7024
EN ISO 2560-A E 38 0 RR 53

CURRENT TYPE

AC/DC-

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| ABS | BV | TÜV |
|-----|----|-----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|-----|------|
| 0.08 | 0.5 | 0.35 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) 0°C |
|--------------------|------------|----------------------|------------------------|----------------|----------------------|
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 17 | not specified |
| EN ISO | | min. 380 | 470-600 | min. 20 | 47 |
| Typical values | AW | 460 | 530 | 25 | 54 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 450 | 130-150 |
| 4.0 x 450 | 180-200 |
| 5.0 x 450 | 275-300 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 4.0 x 450 | CBOX | 70 | 5.9 | 588677-1 |
| 5.0 x 450 | CBOX | 45 | 5.8 | 588678-1 |

Ferrod® 160T

TOP FEATURES

- Very high welding speed
- Smooth weld appearance, very good slag release
- High recovery (160% for 3.2 and 4.0 mm electrodes, and 180% for 5.0 mm electrodes)

CLASSIFICATION

AWS A5.1 E7024
EN ISO 2560-A E 42 0 RR 73

CURRENT TYPE

AC/DC-

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| ABS | BV | DNV | TÜV |
|-----|----|-----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|-----|-----|------|
| 0.1 | 0.9 | 0.45 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) 0°C |
|--------------------|------------|----------------------|------------------------|----------------|----------------------|
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 17 | not specified |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | ≥ 420 | 510-610 | ≥ 22 | ≥ 47 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 450 | 105-140 |
| 4.0 x 450 | 160-220 |
| 5.0 x 450 | 240-320 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 450 | CBOX | 76 | 5.4 | 588679-1 |
| 4.0 x 450 | CBOX | 51 | 5.5 | 588680-1 |
| 5.0 x 450 | CBOX | 39 | 5.8 | 588681-1 |

Ferrod® 165A

TOP FEATURES

- 160% recovery, high welding speed
- Good X-ray soundness
- Even in narrow gaps and rusty materials easy slag release

CLASSIFICATION

AWS A5.1 E7024-1
EN ISO 2560-A E 42 2 RA 73

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| ABS | LR | DNV | TÜV |
|-----|----|-----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si |
|------|------|-----|
| 0.07 | 0.95 | 0.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|-------------|
| | | | | | -10°C | -18°C/-20°C |
| Required: AWS A5.1 | | min.400 | min. 490 | min. 22 | | min. 27 |
| EN ISO | | min.420 | 500-640 | min. 20 | | min. 47 |
| Typical values | AW | 475 | 520 | 26 | 70 | 67 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 450 | 125-155 |
| 4.0 x 450 | 140-235 |
| 5.0 x 450 | 210-330 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 450 | CBOX | 90 | 4.7 | 599534-1 |
| 4.0 x 450 | CBOX | 60 | 6.0 | 599541-1 |
| 5.0 x 450 | CBOX | 40 | 5.9 | 599596-1 |

BASIC 7018

TOP FEATURES

- Recovery 120%
- Excellent weldability even in positional welding
- Good impact values down to -40°C

CLASSIFICATION

AWS A5.1 E 7018
EN ISO 2560-A E 42 4 B 42 H5

CURRENT TYPE

DC+; DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

| LR | BV | DNV | TÜV | DB |
|----|----|-----|-----|----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|------|---------|---------|------------|
| 0.08 | 1.1 | 0.45 | ≤ 0.025 | ≤ 0.015 | 4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|--------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | ≥ 430 | 510-610 | ≥ 24 | ≥ 70 |
| | 600°Cx1h | ≥ 420 | 500-600 | ≥ 22 | ≥ 70 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 65-90 |
| 3.2 x 350 | 120-140 |
| 3.2 x 450 | 120-140 |
| 4.0 x 350 | 160-190 |
| 4.0 x 450 | 160-190 |
| 5.0 x 450 | 210-230 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOX | 180 | 4.0 | 588655-1 |
| 3.2 x 350 | CBOX | 112 | 4.0 | 588656-1 |
| 3.2 x 450 | CBOX | 117 | 5.5 | 588657-1 |
| 4.0 x 350 | CBOX | 79 | 4.0 | 588658-1 |
| 4.0 x 450 | CBOX | 81 | 5.5 | 588659-1 |
| 5.0 x 450 | CBOX | 55 | 5.5 | 588660-1 |

BASIC 7018P

TOP FEATURES

- High quality welding and 120% recovery deliver high productivity
- Excellent weldability, suitable for positional welding
- Good impact values down to -40°C

CLASSIFICATION

AWS A5.1 E 7018 H4
EN ISO 2560-A E 42 4 B 4 2 H5

CURRENT TYPE

DC+; AC

WELDING POSITIONS

All position, except vertical down

APPROVALS

DNV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|--------|--------|
| 0.06 | 1.5 | 0.3 | ≤0.025 | ≤0.025 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -50°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥430 | 490-550 | ≥24 | ≥47 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 65-90 |
| 3.2 x 350 | 100-140 |
| 3.2 x 450 | 100-140 |
| 4.0 x 350 | 140-190 |
| 4.0 x 450 | 140-190 |
| 5.0 x 450 | 190-250 |
| 5.0 x 450 | 190-250 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOX | 185 | 4.1 | 629400 |
| 3.2 x 350 | CBOX | 120 | 4.2 | 629401 |
| 3.2 x 450 | CBOX | 120 | 5.5 | 629402 |
| 4.0 x 350 | CBOX | 85 | 4.3 | 629403 |
| 4.0 x 450 | CBOX | 85 | 5.8 | 629404 |
| 5.0 x 350 | CBOX | 55 | 4.3 | 629406 |
| 5.0 x 450 | CBOX | 55 | 5.5 | 629405 |

Baso® 120

TOP FEATURES

- Recovery 120%
- Excellent weldability even on AC in all positions
- Good impact values down to -30°C

CLASSIFICATION

AWS A5.1 E7018 H4R
EN ISO 2560-A E 42 3 B 12 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.06 | 1.4 | 0.3 | 0.015 | 0.010 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|------------|
| | | | | | -20°C | -50°C | -46°/-50°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | | | min. 27 |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | AW | 480 | 580 | 28 | 200 | 170 | 100 |

AW = As welded

Suitable for both As Welded and Stress Relieve (PWHT) conditions

CTOD value at -10°C > 0.25mm

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 90-140 |
| 3.2 x 450 | 90-140 |
| 4.0 x 350 | 120-160 |
| 4.0 x 450 | 120-160 |
| 5.0 x 450 | 160-240 |
| 5.0 x 450 | 160-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 110 | 2.0 | 570496-1 |
| | VPMD | 110 | 2.0 | 570496-2 |
| 3.2 x 350 | VPMD | 53 | 2.0 | 570526-2 |
| | CBOX | 108 | 4.0 | 570526-1 |
| 3.2 x 450 | CBOH | 52 | 2.5 | 587920-1 |
| | CBOX | 108 | 5.2 | 570519-1 |
| 4.0 x 350 | VPMD | 37 | 2.0 | 570625-2 |
| | CBOH | 37 | 2.6 | 587937-1 |
| 4.0 x 450 | VPMD | 37 | 2.6 | 587937-2 |
| | CBOX | 50 | 5.3 | 570748-1 |

Baso® 48SP

TOP FEATURES

- Excellent welding performance and highly stable and directional arc
- Very good gap bridging and ideally suited for root passes and positional welding
- Weldable on AC and DC
- Stable arc, also at low amperage
- Popular at welding schools

CLASSIFICATION

AWS A5.1 E7016-H8
EN ISO 2560-A E 38 3 B 12 H10

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|---------|---------|
| 0.06 | 0.9 | 0.7 | ≤ 0.020 | ≤ 0.015 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | +20 °C | -30 °C |
| Typical values | AW | ≥ 380 | 470-600 | 25 | 150 | 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-95 |
| 3.2 x 350 | 80-150 |
| 3.2 x 450 | 95-150 |
| 4.0 x 350 | 120-190 |
| 4.0 x 450 | 120-190 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 44 | 0.9 | 571837-2 |
| | CBOH | 100 | 2.0 | 570977-1 |
| 3.2 x 350 | SRP | 51 | 1.7 | 571844-2 |
| | CBOH | 55 | 1.8 | 570984-1 |
| 3.2 x 450 | CBOH | 55 | 2.3 | 570991-1 |
| 4.0 x 350 | SRP | 27 | 1.4 | 571851-2 |
| | CBOH | 40 | 2.0 | 571857-1 |
| 4.0 x 450 | CBOH | 40 | 2.6 | 571004-1 |

Baso® G

TOP FEATURES

- Designed for works highly strained at static and dynamic loadings and service temperature down to -50°C
- Excellent welding characteristics in all positions except vertical down position.
- Very low spatter in both DC and AC, with a high deposition rate
- Low moisture absorption properties ensure extra low diffusible hydrogen level in the weld metal (< 4ml/100g).
- Good slag release and flat bead appearance

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2560-A E 42 5 B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | RINA | TÜV | DB |
|-----|----|----|-----|------|-----|----|
| + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|--------|--------|-------------|
| 0.07 | 1.2 | 0.4 | ≤0.020 | ≤0.010 | <4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|---------|
| | | | | | +20°C | -47°C | -50°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | | min. 27 | |
| EN ISO | | min. 420 | 500-640 | min. 20 | | | min. 47 |
| Typical values | AW | ≥430 | 575 | ≥24 | 200 | | ≥90 |
| | 620°C x 1h | ≥420 | 565 | ≥22 | 200 | | ≥90 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.0 x 300 | 35-55 |
| 2.5 x 350 | 55-90 |
| 3.2 x 350 | 75-120 |
| 3.2 x 450 | 75-120 |
| 4.0 x 350 | 120-180 |
| 4.0 x 450 | 120-180 |
| 5.0 x 450 | 160-240 |

Baso® G

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 60 | 1.4 | 511819-1 |
| | CBOH | 86 | 2.0 | 570823-1 |
| | VPMD | 86 | 2.0 | 521819 |
| 3.2 x 350 | SRP | 50 | 1.8 | 511918-1 |
| | VPMD | 52 | 1.9 | 521918 |
| | CBOX | 110 | 4.0 | 570762-1 |
| 3.2 x 450 | SRP | 50 | 2.4 | 511925-1 |
| | VPMD | 52 | 2.5 | 521919 |
| | VPMD | 116 | 5.5 | 570763-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 511901-1 |
| | CBOX | 81 | 4.2 | 570779-1 |
| 4.0 x 450 | VPMD | 37 | 2.5 | 521888 |
| | CBOX | 81 | 5.5 | 570816-1 |
| 5.0 x 450 | SRP | 21 | 2.1 | 511857-1 |
| | CBOX | 56 | 5.5 | 570786-1 |

MMA

Conarc® 48

TOP FEATURES

- Recovery 130%
- Excellent weldability on DC+ in all positions, especially overhead and vertical up
- Excellent impact toughness down to -40°C
- Excellent X-ray soundness

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2590-A E 46 4 B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DNV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.06 | 1.4 | 0.3 | 0.015 | 0.010 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|------------|
| | | | | | -20°C | -50°C | -46°/-50°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | | | min. 27 |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | AW | 480 | 580 | 28 | 200 | 170 | 100 |

AW = As welded

Suitable for both As Welded and Stress Relieve (PWHT) conditions

CTOD value at -10°C > 0.25mm

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.0 x 300 | 50-80 |
| 2.5 x 350 | 60-90 |
| 3.2 x 450 | 80-130 |
| 4.0 x 450 | 120-160 |
| 5.0 x 450 | 190-270 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0x300 | VPMD | 130 | 1.6 | 503609-3 |
| 2.5 x 350 | VPMD | 86 | 2.0 | 503616-3 |
| 3.2 x 450 | VPMD | 52 | 2.5 | 503630-3 |
| 4.0 x 450 | VPMD | 37 | 2.6 | 503652-3 |
| 5.0 x 450 | VPMD | 25 | 2.7 | 503661-3 |

Conarc® 49

TOP FEATURES

- Almost no spatter, nice wetting and full weld pool control
- One current setting for all positions possible
- Perfect welding and 120% recovery contributes to high productivity

CLASSIFICATION

AWS A5.1 E7018 H4
EN ISO 2560-A E 46 3 B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | RINA | TÜV |
|-----|----|----|-----|------|-----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.09 | 1.1 | 0.6 | 0.015 | 0.010 | 4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|--------|
| | | | | | -20 °C | -30 °C | -40 °C |
| Required: AWS A5.1 | | min. 400 | min. 483 | min. 22 | | min. 27 | 27 |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | AW | 480 | 560 | 28 | 140 | 120 | 80 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 70-80 |
| 3.2 x 350 | 110-130 |
| 4.0 x 450 | 140-180 |
| 5.0 x 450 | 160-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | VPMD | 90 | 2.0 | 609271-1 |
| | CBOX | 190 | 4.1 | 609266-1 |
| 3.2 x 350 | VPMD | 55 | 2.0 | 609272-1 |
| | CBOX | 118 | 4.3 | 609267-1 |
| 3.2 x 450 | VPMD | 55 | 2.4 | 609277-1 |
| 4.0 x 350 | VPMD | 40 | 2.1 | 609273-1 |
| | CBOX | 85 | 4.6 | 609268-1 |
| 4.0 x 450 | VPMD | 40 | 2.7 | 609274-1 |
| | CBOX | 85 | 5.8 | 609269-1 |
| 5.0 x 450 | CBOX | 55 | 5.7 | 609270-1 |

Conarc® 49C

TOP FEATURES

- Reliable impact toughness -40°C, good CTOD at -10°C
- The off-shore electrode when Ni-alloying is not allowed
- 100 - 120% recovery

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2560-A E 46 4 B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV | DB |
|-----|----|----|-----|-----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.06 | 1.4 | 0.3 | 0.015 | 0.010 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|------------|
| | | | | | -20°C | -50°C | -46°/-50°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | | | min. 27 |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | AW | 480 | 580 | 28 | 200 | 170 | 100 |

AW = As welded

Suitable for both As Welded and Stress Relieve (PWHT) conditions. CTOD value at -10°C > 0.25mm

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-80 |
| 3.0 x 350 | 70-110 |
| 3.2 x 350 | 80-130 |
| 4.0 x 350 | 120-160 |
| 4.0 x 450 | 120-160 |
| 5.0 x 450 | 180-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 70 | 1.3 | 511420-1 |
| | CBOH | 110 | 2.0 | 509236-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 511437-1 |
| | CBOX | 108 | 4.0 | 509243-1 |
| 3.2 x 450 | SRP | 50 | 2.4 | 511475-1 |
| | CBOX | 108 | 5.2 | 509250-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 511505-1 |
| | CBOX | 80 | 4.3 | 509359-1 |
| 4.0 x 450 | SRP | 28 | 2.0 | 511536-1 |
| | CBOX | 80 | 5.6 | 509366-1 |
| 5.0 x 450 | SRP | 23 | 2.4 | 511529-1 |
| | CBOX | 50 | 5.3 | 509465-1 |

Conarc® 50

TOP FEATURES

- Good impact values down to -50°C
- Basic very low hydrogen electrode
- Excellent for general purpose welding

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2560-A E 46 5 B 3 2 H5

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|--------|--------|
| 0.07 | 1.2 | 0.4 | ≤0.020 | ≤0.010 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -50°C |
|----------------|-------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | 480 | 580 | 28 | 150 |
| | SR:1h/620°C | ≥420 | 500-590 | ≥22 | ≥90 |

AW = As welded; SR = Stress relieved

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 65-90 |
| 3.2 x 350 | 120-140 |
| 3.2 x 450 | 120-140 |
| 4.0 x 350 | 160-190 |
| 4.0 x 450 | 160-190 |
| 5.0 x 450 | 180-230 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | VPMD | 100 | 2.0 | 619260 |
| | CBOX | 203 | 4.0 | 619241 |
| 3.2 x 350 | VPMD | 55 | 1.9 | 629261 |
| 3.2 x 450 | VPMD | 52 | 2.4 | 629263 |
| 4.0 x 450 | VPMD | 35 | 2.3 | 629264 |
| | CBOX | 83 | 5.5 | 619245 |
| 5.0 x 450 | VPMD | 22 | 2.3 | 629265 |

Conarc® ONE

TOP FEATURES

- Reliable impact toughness -40°C, good CTOD at -10°C
- The off-shore electrode when Ni-alloying is not allowed
- 115 - 120% recovery

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2560-A E 42 5 B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | RINA |
|-----|----|----|-----|------|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.05 | 1.3 | 0.4 | 0.015 | 0.010 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|---------|-------|
| | | | | | -20°C | -40°C | -46°C | -50°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | | | min. 27 | |
| EN ISO | | min. 420 | 500-640 | min. 20 | | min. 47 | | |
| Typical values | AW | 480 | 575 | 28 | 200 | 120 | 100 | 80 |

AW = As welded

CTOD value at -10°C > 0.25mm

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-100 |
| 3.2 x 450 | 90-145 |
| 4.0 x 450 | 110-160 |
| 5.0 x 450 | 160-250 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | VPMD | 90 | 2.1 | 573574-1 |
| | CBOX | 180 | 4.3 | 573536-1 |
| 3.2 x 450 | VPMD | 55 | 2.6 | 573581-1 |
| | CBOX | 115 | 5.5 | 573543-1 |
| 4.0 x 450 | VPMD | 40 | 2.7 | 573598-1 |
| | CBOX | 80 | 5.4 | 573550-1 |
| 5.0 x 450 | VPMD | 25 | 2.6 | 573605-1 |
| | CBOX | 55 | 5.6 | 573567-1 |

HYROD 7018

TOP FEATURES

- Almost no spatter, nice wetting and full weld pool control
- One current setting for all positions possible
- Perfect welding and 120% recovery contributes to high productivity

CLASSIFICATION

AWS E7018 H8
EN ISO 2560-A E 42 3 B 32 H10

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.09 | 1.1 | 0.6 | 0.015 | 0.010 | 4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|--------|
| | | | | | -20 °C | -30 °C | -40 °C |
| Required: AWS A5.1 | | min. 400 | min. 483 | min. 22 | | min. 27 | 27 |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | AW | 480 | 560 | 28 | 140 | 120 | 80 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-95 |
| 3.2 x 450 | 110-130 |
| 4.0 x 450 | 140-180 |
| 5.0 x 450 | 160-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOX | 190 | 4.1 | 599206-1 |
| 3.2 x 450 | CBOX | 118 | 5.2 | 599213-1 |
| 4.0 x 450 | CBOX | 85 | 5.8 | 599220-1 |
| 5.0 x 450 | CBOX | 55 | 5.7 | 599237-1 |

HYROD 7018LT

TOP FEATURES

- The weld metal diffusible hydrogen content conforms to low hydrogen, < 5 ml/100g deposited weld metal.
- Impact toughness down to -40 °C.
- Weld metal recovery:~120%.

CLASSIFICATION

AWS E7018-1 H4R
EN ISO 2560-A E 46 4 B 32 H5

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|-----|-------|-------|------------|
| 0.06 | 1.4 | 0.3 | 0.015 | 0.010 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|------------|
| | | | | | -20°C | -50°C | -46°/-50°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | | | min. 27 |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | AW | 480 | 580 | 28 | 200 | 170 | 100 |

AW = As welded

Suitable for both As Welded and Stress Relieve (PWHT) conditions

CTOD value at -10°C > 0.25mm

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 450 | 80-130 |
| 4.0 x 450 | 120-160 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 4.0 x 450 | CBOX | 80 | 5.6 | 597530-1 |

KARDO

TOP FEATURES

- Low yield and ultimate tensile strength, high impact toughness
- Buffer layer electrode for internally clad stainless steel
- HDM < 3 ml/100g

CLASSIFICATION

AWS A5.1 E 6018 *
EN ISO 2560-A E 35 2 B 32 H5

* According to classification 1966

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | HDM |
|------|-----|------|-------|-------|------------|
| 0.03 | 0.4 | 0.25 | 0.015 | 0.010 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -18°C/-20°C |
|--------------------|------------|----------------------|------------------------|----------------|------------------------------|
| Required: AWS A5.1 | | min. 331 | min. 414 | min. 22 | min. 27 |
| EN ISO | | min. 355 | 440-570 | min. 22 | |
| Typical values | AW | 390 | 450 | 28 | >200 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-80 |
| 3.2 x 350 | 90-120 |
| 4.0 x 350 | 120-160 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 23 | 0.4 | 541762-1 |
| 3.2 x 350 | SRP | 17 | 0.6 | 541779-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 541755-1 |

LINCOLN 7018-1

TOP FEATURES

- Excellent for general purpose welding
- Good impact values down to -46°C
- Shall be welded in AC and DC+/- mode.

CLASSIFICATION

AWS A5.1 E7018-1 H4
EN ISO 2560-A E 42 4 B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|------|-------|-------|
| 0.06 | 1.3 | 0.30 | 0.025 | 0.025 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -50°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥430 | 490-550 | ≥24 | ≥47 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 65-95 |
| 3.2 x 350 | 100-135 |
| 3.2 x 450 | 85-135 |
| 4.0 x 350 | 110-210 |
| 4.0 x 450 | 110-210 |
| 5.0 x 450 | 170-240 |

LINCOLN 7018-1

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|----------------|
| 2.5 x 350 | BOX | 90 | 2.0 | 629181 |
| | VPMD | 90 | 2.0 | 619181 |
| | CBOX | 185 | 4.1 | 619036, 629036 |
| 3.2 x 350 | BOX | 55 | 1.9 | 629182 |
| | VPMD | 55 | 1.9 | 619182 |
| | CBOX | 120 | 4.2 | 619038, 629038 |
| 3.2 x 450 | BOX | 55 | 2.5 | 629225 |
| | CBOX | 120 | 5.5 | 619040, 629040 |
| 4.0 x 350 | BOX | 40 | 2.0 | 629183 |
| | VPMD | 40 | 2.0 | 619183 |
| | CBOX | 85 | 4.3 | 619044, 629044 |
| 4.0 x 450 | BOX | 40 | 2.7 | 629226 |
| | VPMD | 40 | 2.7 | 619226 |
| | CBOX | 85 | 5.8 | 619045, 629045 |
| 5.0 x 450 | CBOX | 55 | 5.5 | 619049, 629049 |

MMA

VANDAL

TOP FEATURES

- Smooth and stable arc.
- Well suited for positional welding (particularly vertical and overhead).
- Good slag removal even in narrow gaps.

CLASSIFICATION

AWS A5.1 E 7018-1 H4
EN ISO 2560-A E 42 4 B 32 H5

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | RINA |
|-----|----|----|------|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|--------|--------|
| 0.08 | 1.2 | 0.4 | ≤0.020 | ≤0.015 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -50°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥420 | 510-610 | ≥24 | ≥90 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 65-95 |
| 3.2 x 450 | 85-135 |
| 4.0 x 450 | 110-210 |
| 5.0 x 450 | 170-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 90 | 1.9 | 619167 |
| | VPMD | 90 | 1.9 | 619184 |
| 3.2 x 350 | CBOH | 55 | 1.9 | 619168 |
| | VPMD | 55 | 1.9 | 619300 |
| 3.2 x 450 | CBOH | 55 | 2.4 | 619169 |
| | VPMD | 55 | 2.4 | 619207 |
| 4.0 x 450 | CBOH | 40 | 2.7 | 619171 |
| | VPMD | 40 | 2.7 | 619208 |
| 5.0 x 450 | CBOH | 25 | 2.6 | 619172 |

Conarc® L150

TOP FEATURES

- Self releasing slag
- Suitable for welding primer painted components
- ~165% recovery
- Excellent weldability on AC and DC
- Free of cracks and good X-ray quality
- ISO-V toughness down to -40°C.

TYPICAL APPLICATIONS

- Shipyards

CLASSIFICATION

AWS A5.1 E7028 H4
EN ISO 2560-A E 42 4 B 53 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| ABS | BV | DNV | TÜV | DB |
|-----|----|-----|-----|----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|-----|-----|-----|--------|--------|
| 0.1 | 1.1 | 0.6 | ≤0.025 | ≤0.015 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -18°C/-20°C |
|--------------------|------------|----------------------|------------------------|----------------|------------------------------|
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | min. 27 |
| EN ISO | | min. 420 | 500-610 | min. 20 | min. 47 |
| Typical values | AW | ≥420 | 510-610 | ≥26 | |
| | 600°C x 2h | ≥420 | 500-600 | ≥26 | |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 450 | 140-160 |
| 4.0 x 450 | 175-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 450 | SRP | 30 | 1.9 | 554557-1 |
| 4.0 x 450 | SRP | 23 | 2.3 | 554509-1 |

HYROD 7028

TOP FEATURES

- Self releasing slag
- Suitable for welding primer painted components
- ~165% recovery
- Excellent weldability on AC and DC
- Free of cracks and good X-ray quality
- ISO-V toughness down to -40°C

CLASSIFICATION

AWS E 7028 H4
EN ISO 2560-A E 42 4 B 53 H5

WELDING POSITIONS

Flat/Horizontal

TYPICAL APPLICATIONS

- Shipyard

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|-----|-----|-----|--------|--------|
| 0.1 | 1.1 | 0.6 | ≤0.025 | ≤0.015 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | -18°C/-20°C | -40°C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | min. 27 | |
| EN ISO | | min. 420 | 500-610 | min. 20 | min. 47 | |
| Typical values | AW | ≥420 | 510-610 | ≥26 | | ≥80 |
| | 600°C x 2h | ≥420 | 500-600 | ≥26 | | ≥80 |

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 350 | 140-160 |
| 4.0 x 450 | 175-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | SRP | 30 | 1.5 | 597066-1 |
| 4.0 x 450 | SRP | 23 | 2.3 | 597073-1 |

Lincoln® 7016 DR

TOP FEATURES

- Excellent welding performance and highly stable and directional arc
- Very good gap bridging and ideally suited for root passes and positional welding
- Weldable on AC and DC
- Stable arc, also at low amperage
- Popular at welding schools

CLASSIFICATION

AWS A5.1 E7016-H8
EN ISO 2560-A E 42 2 B 1 2 H10

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | HDM |
|------|-----|-----|------------|
| 0.08 | 1.2 | 0.6 | 5 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | +20 °C | -30 °C |
| Typical values | AW | ≥ 380 | 470-600 | 26 | ≥ 150 | ≥ 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 95-150 |
| 3.2 x 450 | 95-150 |
| 4.0 x 350 | 140-190 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 66 | 1.3 | 839275 |
| | CBOX | 200 | 3.9 | 829275 |
| 3.2 x 350 | SRP | 51 | 1.7 | 839276 |
| | CBOX | 125 | 4.1 | 829276 |
| 3.2 x 450 | CBOX | 125 | 5.3 | 829277 |
| 4.0 x 450 | CBOX | 80 | 5.2 | 829278 |

Pipeliner® 16P

TOP FEATURES

- DC- (DCEN) is the recommended polarity for root pass welding on pipe

CLASSIFICATION

AWS A5.1 E7016-H4, E7016-1 H4

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|-------|-------|
| 0.06 | 1.3 | 0.5 | 0.013 | 0.009 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | -29 °C / -30 °C | -40 °C |
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | min. 27 | |
| Typical values | AW | 470 | 590 | 26 | 120 | 90 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-105 |
| 3.2 x 350 | 75-135 |
| 4.0 x 350 | 120-170 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CAN | - | 4.5 | ED033835 |
| | CAN | - | 22.7 | ED030916 |
| 3.2 x 350 | CAN | - | 4.5 | ED033836 |
| | CAN | - | 22.7 | ED030917 |

Baso® 100

TOP FEATURES

- Designed for pipe welding in position, excellent for general purpose welding
- Very thin coating to improve joint access when root pass welding
- Good side wall wetting
- Impact toughness down to -50°C
- Popular at welding schools

CLASSIFICATION

AWS A5.1 E7016-1 H4
EN ISO 2560-A E 42 5 B 12 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|-------|-------|
| 0.06 | 1.2 | 0.5 | ≤0.02 | ≤0.02 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°/-30°C |
|--------------------|------------|----------------------|------------------------|----------------|-----------------------------|
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | min. 27 |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | ≥420 | 500-640 | 26 | ≥110 |
| | 620°C x 1h | ≥390 | 500-620 | ≥22 | ≥110 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 80-130 |
| 4.0 x 350 | 125-170 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 110 | 2.1 | 570175-1 |
| 3.2 x 350 | CBOX | 140 | 4.4 | 570182-1 |
| 4.0 x 350 | CBOX | 95 | 4.4 | 570298-1 |

Conarc® 51

TOP FEATURES

- Designed for pipe welding in position with very thin coating to improve joint access when root pass welding
- Outstanding penetration and stable arc
- Excellent impact at -50°C
- Matching NACE requirements
- Efficiency 100%

CLASSIFICATION

AWS A5.1 E7016-1 H4
EN ISO 2560-A E 42 5 B 12 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S |
|------|-----|-----|-------|-------|
| 0.06 | 1.2 | 0.5 | ≤0.02 | ≤0.02 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°/-30°C |
|--------------------|------------|----------------------|------------------------|----------------|-----------------------------|
| Required: AWS A5.1 | | min. 400 | min. 490 | min. 22 | min. 27 |
| EN ISO | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | AW | ≥420 | 500-640 | 26 | ≥110 |
| | 620°C x 1h | ≥390 | 500-620 | ≥22 | ≥110 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 80-130 |
| 3.2 x 450 | 80-120 |
| 4.0 x 350 | 125-170 |
| 4.0 x 450 | 125-170 |
| 5.0 x 450 | 170-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 69 | 1.3 | 511567-1 |
| 3.2 x 350 | SRP | 56 | 1.7 | 511581-1 |
| 3.2 x 450 | SRP | 56 | 2.2 | 509892-1 |
| 4.0 x 450 | SRP | 28 | 1.6 | 509908-1 |
| 5.0 x 450 | SRP | 25 | 2.2 | 511628-1 |

LINCOLN® 7010

TOP FEATURES

- Used for root and hot passes as well as filling and capping up to X60 grades
- When root pass welding, negative polarity is recommended
- Excellent weldability in all positions

CLASSIFICATION

AWS A5.5 E 7010-P1
EN ISO 2560-A E 42 3 Mo C 21

CURRENT TYPE

DC+/DC-

WELDING POSITIONS

All positions

APPROVALS

| ABS | LR | DNV | TÜV |
|-----|----|-----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Mo |
|-----|-----|-----|-----|
| 0.1 | 0.7 | 0.2 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥420 | 500-640 | ≥22 | ≥60 |

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 40-80 |
| 3.2 x 350 | 60-110 |
| 4.0 x 350 | 90-140 |
| 5.0 x 350 | 110-170 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CAN | 555 | 9.0 | 627261 |
| 3.2 x 350 | CAN | 355 | 9.5 | 627262 |
| 4.0 x 350 | CAN | 237 | 9.5 | 627263 |
| 5.0 x 350 | CAN | 158 | 9.5 | 627264 |

LINCOLN® 8010

TOP FEATURES

- Used for root and hot passes as well as filling and capping up to X70 grades
- Clearly visible weld puddle for improved control and weldability
- Excellent weldability in all positions

CLASSIFICATION

AWS A5.1 E 8010-G
EN ISO 2560-A E 46 3 1NiMo C 21

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

APPROVALS

| ABS | LR | DNV | TÜV |
|-----|----|-----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Ni | Mo |
|-----|-----|-----|-----|-----|
| 0.1 | 0.8 | 0.2 | 0.7 | 0.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥485 | 570-680 | ≥22 | ≥60 |

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 350 | 60-110 |
| 4.0 x 350 | 90-140 |
| 5.0 x 350 | 110-170 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | CAN | 355 | 9.5 | 627266 |
| 4.0 x 350 | CAN | 238 | 9.5 | 627267 |
| 5.0 x 350 | CAN | 156 | 9.5 | 627268 |

Pipeliner® 7P+

TOP FEATURES

- Root pass welding of up to X80 grade pipe
- Hot, fill and cap pass of up to X65 grade pipe
- Vertical down welding
- Meets NACE MR0175 for sour gas applications
- Test data available for SSC (NACE TM0177)
- Cellulosic electrode

CLASSIFICATION

AWS A5.1 E7010-P1, also meets E7010-G

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | Mo |
|------|-----|-----|-------|-------|------|-----|
| 0.15 | 0.6 | 0.1 | 0.015 | 0.015 | 0.85 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | -29°C | -40°C |
| Required: AWS A5.1 | | min. 415 | min. 490 | min. 22 | 27 | |
| Typical values | AW | 470 | 570 | 24 | 80 | 70 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 350 | 65-130 |
| 4.0 x 350 | 100-165 |
| 5.0 x 450 | 130-210 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | CAN | - | 22.7 | ED031611 |
| 4.0 x 350 | CAN | - | 22.7 | ED031612 |

Pipeliner® 8P+

TOP FEATURES

- High productivity in vertical down and out-of-position pipe welding
- Deep penetration
- Clean, visible weld puddle
- Meets NACE MR0175 for sour gas applications
- Test data available for SSC (NACE TM0177)
- Cellulosic electrode

CLASSIFICATION

AWS A5.5 E8010-G, E8010-P1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Ni | Mo | P | S |
|------|-----|------|-----|-----|------|------|
| 0.17 | 0.7 | 0.25 | 0.8 | 0.2 | 0.01 | 0.01 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|
| | | | | | -29°C | -40°C | -46°C |
| Required: AWS A5.5 | | min. 460 | min. 550 | min. 19 | min. 27 | | |
| Typical values | AW | 495 | 590 | 24 | 80 | 60 | 50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 350 | 65-120 |
| 4.0 x 350 | 100-165 |
| 5.0 x 350 | 130-210 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | CAN | - | 22.7 | ED030826 |
| 4.0 x 350 | CAN | - | 22.7 | ED030827 |
| 5.0 x 350 | CAN | - | 22.7 | ED030828 |

Shield-Arc® 70+

TOP FEATURES

- Light slag for minimal arc interference
- Deep penetration
- Clean, visible weld puddle
- Superior puddle control

CLASSIFICATION

AWS A5.5 E8010-P1, E8010-G

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Ni | Cr | Mo | V |
|-----------|---------|----------|-----------|----------|-----------|-----------|
| 0.13-0.17 | 0.6-1.2 | 0.05-0.3 | 0.75-0.97 | 0.01-0.2 | 0.05-0.15 | 0.02-0.04 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|--------|--------|
| | | | | | -29 °C | -40 °C | -46 °C |
| Required: AWS A5.5 | | min. 460 | min. 550 | min. 19 | | | |
| Typical values | AW | 460-620 | 585-680 | 24 | 75 | | 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 355 | 75-130 |
| 4.0 x 355 | 90-185 |
| 4.8 x 355 | 140-225 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | CAN | - | 22.7 | ED012841 |
| 4.0 x 350 | CAN | - | 22.7 | ED012849 |
| 4.8 x 350 | CAN | - | 22.7 | ED012845 |

Shield-Arc® HYP+

TOP FEATURES

- Light slag for minimal arc interference
- Deep penetration
- Clean, visible weld puddle
- Superior puddle control

CLASSIFICATION

AWS A5.5 E7010-P1, E7010-G

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Mo | V |
|-----------|-----------|-----------|-----------|-------|
| 0.13-0.17 | 0.49-0.63 | 0.08-0.18 | 0.27-0.31 | <0.01 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | -20 °C | -29 °C |
| Required: AWS A5.5 | | min. 415 | min. 490 | min. 22 | | min. 27 |
| Typical values | AW | 435-525 | 525-635 | 24 | | 50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 355 | 75-130 |
| 4.0 x 355 | 90-185 |
| 4.8 x 355 | 140-225 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | CAN | - | 22.7 | ED029511 |
| 4.0 x 350 | CAN | - | 22.7 | ED029513 |
| 4.8 x 350 | CAN | - | 22.7 | ED029509 |

Conarc® 60G

TOP FEATURES

- Good impact values down to -51°C
- DC welding preferred
- 115 - 120% recovery

CLASSIFICATION

AWS A5.5 E9018M-H4
EN ISO 18275-A E 55 4 Z B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | Mo | HDM |
|------|-----|-----|-------|-------|-----|-----|------------|
| 0.06 | 1.0 | 0.4 | 0.015 | 0.010 | 1.6 | 0.3 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|-------------|----------------------|------------------------|----------------|------------------|---------|---------|
| | | | | | -20°C | -40°C | -51°C |
| Required: AWS A5.5 | | 540-620* | min. 620 | min. 24 | | | min. 27 |
| EN ISO | | min. 550 | 610-780 | min. 18 | | min. 47 | |
| Typical values | AW | 600 | 670 | 25 | | 98 | |
| | SR:1h/620°C | 550 | 640 | 24 | 90 | | 40 |

AW = As welded; SR = Stress relieved

* Diameter 2.5 mm max 655 MPa

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-100 |
| 3.2 x 350 | 80-130 |
| 4.0 x 350 | 120-180 |
| 5.0 x 450 | 160-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 62 | 1.4 | 523614-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 523652-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 523645-1 |
| 5.0 x 450 | SRP | 23 | 2.4 | 523638-1 |

Conarc® 70G

TOP FEATURES

- Good impact values down to -40°C
- DC welding preferred
- 115 - 120% recovery

CLASSIFICATION

AWS A5.5 E9018-G-H4
EN ISO 18275-A E 55 4 1NiMo B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| DNV | TÜV |
|-----|-----|
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | Mo | HDM |
|------|-----|-----|-------|-------|-----|-----|------------|
| 0.06 | 1.2 | 0.4 | 0.014 | 0.009 | 1.0 | 0.4 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|--------------|----------------------|------------------------|----------------|------------------|---------|-------|
| | | | | | -20°C | -40°C | -46°C |
| Required: AWS A5.5 | | min. 530 | min. 620 | min. 17 | not specified | | |
| EN ISO | | min. 550 | 610-780 | min. 18 | | min. 47 | |
| Typical values | AW | 600 | 655 | 24 | | 90 | 60 |
| | SR:15h/580°C | 550 | 640 | 24 | 90 | | 50 |

AW = As welded; SR = Stress relieved

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-100 |
| 3.2 x 350 | 80-130 |
| 4.0 x 350 | 120-180 |
| 5.0 x 450 | 160-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 64 | 1.2 | 523706-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 523737-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 523713-1 |
| 4.0 x 450 | SRP | 28 | 2.0 | 523744-1 |
| 5.0 x 450 | SRP | 23 | 2.4 | 523720-1 |

Kryo® 1

TOP FEATURES

- Excellent mechanical properties (impact down to -60°C)
- Good CTOD down to -10°C
- Extremely low hydrogen content
- 110 - 120% recovery
- Weldable on AC and DC

CLASSIFICATION

AWS A5.5 E7018-G-H4R
EN ISO 2560-A E 50 6 Mn1Ni B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV | DB |
|-----|----|----|-----|-----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|-----|-----|-------|-------|-----|------------|
| 0.05 | 1.5 | 0.4 | 0.010 | 0.010 | 0.9 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|-------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | -20°C | -60°C |
| Required: AWS A5.5 | | min. 390 | min. 480 | min. 22 | not specified | |
| EN ISO | | min. 500 | 560-720 | min. 18 | min. 47 | |
| Typical values | AW | 550 | 640 | 24 | 150 | 90 |
| | SR:580°C/15 | 460 | 550 | 24 | | 90 |

AW = As welded; SR = Stress relieved

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-80 |
| 3.0 x 350 | 70-110 |
| 3.2 x 350 | 80-140 |
| 3.2 x 450 | 80-140 |
| 4.0 x 350 | 120-170 |
| 4.0 x 450 | 120-170 |
| 5.0 x 450 | 180-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 70 | 1.3 | 524383-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 524390-1 |
| 3.2 x 450 | SRP | 10 | 0.5 | 515725-1 |
| | SRP | 50 | 2.4 | 524437-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 524468-1 |
| 4.0 x 450 | SRP | 28 | 2.0 | 524499-1 |
| 5.0 x 450 | SRP | 22 | 2.4 | 524475-1 |

Kryo® 1-180

TOP FEATURES

- Extremely low hydrogen content
- Approx. 175% recovery, easy slag release, weldable on AC and DC
- Filling horizontal V- and X-grooves

CLASSIFICATION

EN ISO 2560-A E 50 5 1Ni B 73 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| LR | DNV | TÜV | DB |
|----|-----|-----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|-----|-----|------|--------|-----|------------|
| 0.07 | 1.2 | 0.3 | 0.02 | 0.0010 | 0.9 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|-------------|---------------------------|------------------------|----------------|------------------|---------|
| | | | | | -40°C | -50°C |
| Required: AWS A5.5 | | min. 460 | min. 550 | min. 19 | not specified | |
| EN ISO | | min. 500 | 560-720 | min. 18 | | min. 47 |
| Typical values | AW | 550 | 640 | 26 | 90 | 60 |
| | SR:600°C/4h | 540 | 620 | 24 | 100 | 85 |

AW = As welded; SR = Stress relieved

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 3.2 x 450 | 130-160 |
| 4.0 x 450 | 170-240 |
| 5.0 x 450 | 250-300 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 450 | SRP | 27 | 1.7 | 524765-1 |
| 4.0 x 450 | SRP | 23 | 2.3 | 524734-1 |
| 5.0 x 450 | SRP | 19 | 2.7 | 524772-1 |

Kryo® 1P

TOP FEATURES

- Excellent mechanical properties (impact down to -60°C)
- Good CTOD at -10°C
- Extremely low hydrogen content
- 112 - 120% recovery
- Weldable on AC and DC

CLASSIFICATION

AWS A5.5 E 8018-G-H4R
EN ISO 2560-A E 50 6 Mn1Ni B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | BV | DNV | TÜV | DB |
|-----|----|-----|-----|----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|-----|-----|-------|-------|------|------------|
| 0.05 | 1.5 | 0.5 | 0.010 | 0.005 | 0.95 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|--------------|---------------------------|------------------------|----------------|------------------|---------|
| | | | | | -40°C | -60°C |
| Required: AWS A5.5 | | min. 460 | min. 550 | min. 19 | not specified | |
| EN ISO | | min. 500 | 560-720 | min. 18 | | min. 47 |
| Typical values | AW | 550 | 640 | 24 | 140 | 80 |
| | SR:580°C/15h | 460 | 550 | 24 | 150 | 90 |

AW = As welded; SR = Stress relieved

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-85 |
| 3.2 x 350 | 80-145 |
| 3.2 x 450 | 80-145 |
| 4.0 x 350 | 120-185 |
| 4.0 x 450 | 120-185 |
| 5.0 x 450 | 180-270 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 70 | 1.3 | 519211-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 519181-1 |
| 3.2 x 450 | SRP | 50 | 2.4 | 519273-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 519198-1 |
| 4.0 x 450 | SRP | 28 | 2.0 | 519280-1 |
| 5.0 x 450 | SRP | 22 | 2.4 | 519204-1 |

Kryo® 1R

TOP FEATURES

- Excellent mechanical properties (impact down to -60°C)
- Weldable on AC and DC
- Extremely low hydrogen content

CLASSIFICATION

AWS A5.5 E 8018-C3-H4R
EN ISO 2560-A E 46 6 1Ni B 32 H5

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV |
|-----|----|----|-----|-----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|------|-----|-------|-------|-----|------------|
| 0.07 | 1.15 | 0.4 | 0.015 | 0.005 | 0.9 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | -40°C | -60°C |
| Required: AWS A5.5 | | 470-550 | 550 | min. 24 | | 47 |
| EN ISO 2560-A | | 460 | 530-680 | min. 20 | | |
| Typical values | AW | 520 | 585 | 24 | 140 | 115 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 70 | 1.4 | 524809-1 |
| 3.2 x 350 | SRP | 50 | 1.8 | 524816-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 524823-1 |

Kryo® 2

TOP FEATURES

- Excellent impact toughness at -60°C
- Good CTOD at -15°C
- Extremely low hydrogen content

CLASSIFICATION

AWS A5.5 E 9018-G-H4R
EN ISO 2560-A E 55 6 Z B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|-----|-----|-------|------|-----|------------|
| 0.05 | 1.6 | 0.3 | 0.015 | 0.01 | 1.5 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|-------------|---------------------------|------------------------|----------------|------------------|-------|---------|
| | | | | | -40°C | -50°C | -60°C |
| Required: AWS A5.5 | | min. 530 | min. 620 | min. 17 | not specified | | |
| EN ISO | | min. 550 | 610-780 | min. 18 | | | min. 47 |
| Typical values | AW | 570 | 650 | 22 | 140 | 110 | 60 |
| | SR:620°C/1h | 530 | 620 | 22 | | | |

AW = As welded; SR = Stress relieved

CTOD value at -10°C > 0.25 mm

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-85 |
| 3.2 x 450 | 80-140 |
| 4.0 x 450 | 120-170 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 68 | 1.4 | 524642-1 |
| 3.2 x 450 | SRP | 50 | 2.5 | 524659-1 |
| 4.0 x 450 | SRP | 28 | 2.0 | 524666-1 |

Kryo® 3

TOP FEATURES

- 115 - 120% recovery
- Excellent impact toughness down to -80°C
- Good CTOD at -10°C
- Extremely low hydrogen content

CLASSIFICATION

AWS A5.5 E8018-C1-H4
EN ISO 2560-A E 50 6 Mn1Ni B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| | |
|----|-----|
| LR | TÜV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|-----|-----|-------|------|-----|------------|
| 0.05 | 0.7 | 0.3 | 0.015 | 0.01 | 2.5 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|-------------|---------------------------|------------------------|----------------|------------------|---------|
| | | | | | -60°C | -80°C |
| Required: AWS A5.5 | SR* | min. 460 | min. 550 | min. 19 | min. 27 | |
| EN ISO | | min. 460 | 530-680 | min. 20 | | min. 47 |
| Typical values | AW | 520 | 600 | 26 | 120 | 60 |
| | SR:620°C/1h | 500 | 590 | 29 | 90 | |

AW = As welded; SR = Stress relieved

CTOD value at -10°C > 0.25 mm

SR* = 605±14°C/1h

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-80 |
| 3.2 x 350 | 80-140 |
| 3.2 x 450 | 80-140 |
| 4.0 x 350 | 120-170 |
| 4.0 x 450 | 120-170 |
| 5.0 x 450 | 180-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 3.2 x 350 | SRP | 50 | 1.9 | 524604-1 |
| 3.2 x 450 | SRP | 50 | 2.4 | 524543-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 524574-1 |

Kryo® 4

TOP FEATURES

- Excellent impact toughness down to -80°C in as welded condition and -100°C after PWHT
- Extremely low hydrogen content
- Shall be used in AC or DC+/- mode.

CLASSIFICATION

AWS A5.5 E7016-C2L H4
EN ISO 2560-A E 42 6 3Ni B 12 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | HDM |
|------|-----|-----|------|-------|-----|------------|
| 0.03 | 0.6 | 0.4 | 0.01 | 0.005 | 3.6 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | -80°C | -101°C |
| Required: AWS A5.5 | PWHT* | min. 390 | min. 480 | min. 25 | | min. 27 |
| EN ISO | AW | min. 380 | 470-600 | min. 20 | 47 | |
| Typical values | AW | 490 | 570 | 30 | 90 | |
| | PWHT* | 420 | 510 | 30 | 120 | 90 |

AW = As welded

* 605±14°C/1h

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 80-140 |
| 4.0 x 350 | |
| 4.0 x 450 | |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | TBD | 0.0 | 524970-1 |
| 3.2 x 350 | SRP | TBD | 0.0 | 524932-1 |
| 4.0 x 350 | SRP | TBD | 0.0 | 524949-1 |

SL® 12G

TOP FEATURES

- Service temperature from -40 up to 500°C
- DC-welding preferred
- 115 - 120% recovery

CLASSIFICATION

AWS A5.5 E7018-A1-H4R
EN ISO 3580-A E Mo B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| DNV | TÜV | DB |
|-----|-----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Mo | HDM |
|------|-----|-----|-------|-------|------|------------|
| 0.05 | 0.8 | 0.6 | 0.020 | 0.010 | 0.55 | 2 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | +20°C | -20°C |
| Required: AWS A5.5 | SR(1) | min. 390 | min. 490 | min. 25 | not specified | |
| EN ISO | SR(2) | min. 355 | min. 510 | min. 22 | min. 47 | |
| Typical values | SR(3) | 560 | 620 | 25 | 140 | 50 |
| | AW | 550 | 610 | 25 | 160 | 70 |

AW = As welded

Stress relieved: SR(1) = 620±14°C/1h, SR(2) = 570-620°C/1h, SR(3) = 620°C/1h

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 80-130 |
| 4.0 x 350 | 120-180 |
| 5.0 x 450 | 160-240 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 67 | 1.4 | 523973-1 |
| | CBOH | 94 | 2.0 | 516999-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 524017-1 |
| | CBOX | 108 | 4.0 | 516968-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 524000-1 |
| | CBOX | 80 | 4.3 | 516975-1 |
| 5.0 x 450 | CBOX | 50 | 5.3 | 516982-1 |

SL® 22G

TOP FEATURES

- Maximum service temperature 550 °C
- AC/DC electrode + or -. DC welding by preference. Root pass in open joints, electrode negative preferable
- 115 - 120% recovery

CLASSIFICATION

AWS A5.5 E 8018-B1-H4
EN ISO 3580-A E Z B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Cr | Mo | HDM |
|------|-----|-----|-------|-------|-----|-----|------------|
| 0.06 | 0.8 | 0.6 | 0.020 | 0.010 | 0.5 | 0.5 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | +20 °C | -10 °C |
| Required: AWS A5.5 | SR(1) | min. 460 | min. 550 | min. 19 | not specified | |
| Typical values | SR(2) | 570 | 640 | 24 | 180 | 110 |

* Stress relieved: SR(1) = 690±14 °C/1h, SR(2) = 730 °C/1h

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 60-90 |
| 3.2 x 350 | 80-130 |
| 4.0 x 350 | 120-180 |
| 5.0 x 450 | 160-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 63 | 1.3 | 524246-1 |
| 3.2 x 350 | SRP | 50 | 1.9 | 524284-1 |
| 4.0 x 350 | SRP | 28 | 1.5 | 524277-1 |

Conarc® 55CT

TOP FEATURES

- Excellent mechanical properties (impact down to -40°C)
- Suitable for positional welding and welding with an inverter power source.
- Very low diffusible hydrogen content.
- The weld deposit has a very similar appearance to Cor-Ten A steel.

CLASSIFICATION

AWS A5.5 E 8018-G H4R
EN ISO 2590-A E 50 4 Z B 32 H5

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | Cu | Cr |
|------|-----|-----|-------|-------|------|------|-----|
| 0.06 | 1.3 | 0.4 | ≤0.02 | ≤0.02 | 0.45 | 0.45 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | -18°C | -40°C |
| Required: AWS A5.5 | | min. 460 | min. 550 | min. 19 | min. 27 | |
| EN ISO 2560-A | AW | min. 500 | 560-720 | min. 18 | | ≥47 |
| Typical values | | ≥500 | 560-720 | ≥23 | | 100 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 55-85 |
| 3.2 x 350 | 80-145 |
| 4.0 x 350 | 120-185 |
| 5.0 x 450 | 180-270 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | SRP | 62 | 1.5 | 523522-1 |
| 3.2 x 350 | SRP | 50 | 2.0 | 523539-1 |
| 4.0 x 350 | SRP | 27 | 1.9 | 523546-1 |

DEVIATIONS: CHEMICAL COMPOSITION

Mn = 1.4-1.9% AWS: Mn = 0.50-1.30%
Si = 0.15-0.60% AWS: Si = 0.35-0.80%
Cr = 0.1% AWS: Cr = 0.45-0.70%
Ni = 0.7-1.0% AWS: Ni = 0.40-0.80%
Cu = 0.3-0.5% EN: Cu max. 0.3%

Arosta® 304L

TOP FEATURES

- Excellent corrosion resistance in oxidizing environments such as nitric acid
- High resistance to intergranular corrosion
- Smooth bead appearance
- Easy slag release
- Strong electrode coating
- Weldable on AC and DC

CLASSIFICATION

AWS A5.4 E308L-16
EN ISO 3581-A E 19 9 L R 12

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| BV | TÜV |
|----|-----|
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|------|-----|-----|------|-----|--------------------|
| 0.02 | 0.8 | 0.8 | 19.5 | 9.7 | 4-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|--------|
| | | | | | +20°C | -20°C | -196°C |
| Required: AWS A5.4 | | not specified | min. 520 | min. 35 | not specified | | |
| EN ISO | | min. 320 | min. 510 | min. 30 | not specified | | |
| Typical values | AW | 440 | 580 | 43 | 70 | 60 | 24 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.0 x 300 | 30-50 |
| 2.5 x 350 | 40-75 |
| 3.2 x 350 | 60-110 |
| 4.0 x 350 | 80-150 |
| 5.0 x 350 | 140-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 93 | 1.0 | 527520-1 |
| 2.5 x 350 | SRP | 69 | 1.4 | 530087-1 |
| | CBOH | 105 | 2.1 | 527537-1 |
| 3.2 x 350 | SRP | 56 | 1.8 | 530063-1 |
| | CBOX | 130 | 4.1 | 527834-1 |
| 4.0 x 350 | CBOX | 83 | 4.4 | 527940-1 |
| 5.0 x 350 | CBOX | 50 | 4.1 | 528053-1 |

Arosta® 307

TOP FEATURES

- Especially developed for steels difficult to weld, such as armour plates and austenitic high Mn-steels
- Often used as a buffer layer in hardfacing applications
- Weldable on AC and DC+ polarity

CLASSIFICATION

AWS A5.4 E307-16
EN ISO 3581-A E 188 Mn R 12

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| | |
|-----|----|
| TÜV | DB |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|------|-----|-----|------|-----|--------------------|
| 0.09 | 5.0 | 0.6 | 18.5 | 8.5 | 0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | +20°C | -60°C |
| Required: AWS A5.4 | | not specified | min. 590 | min. 30 | not specified | |
| EN ISO | | min. 350 | min. 500 | min. 25 | not specified | |
| Typical values | AW | 450 | 650 | 35 | 110 | 75 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 70-80 |
| 3.2 x 350 | 90-120 |
| 4.0 x 350 | 110-140 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 97 | 2.1 | 527391-1 |
| 3.2 x 350 | CBOX | 130 | 4.4 | 527407-1 |
| 4.0 x 350 | CBOX | 86 | 4.5 | 527414-1 |

Arosta® 309S

TOP FEATURES

- For welding stainless steel to mild steel and root runs in clad steel
- Applicable for root passes in N alloyed AISI 304LN steels
- Excellent weldability and self releasing slag
- High resistance to embrittlement
- Weldable on AC and DC+ polarity

CLASSIFICATION

AWS A5.4 E 309L-16
EN ISO 3581-A E 23 12 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | BV | TÜV |
|-----|----|-----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|------|-----|-----|------|------|--------------------|
| 0.02 | 0.8 | 0.8 | 23.5 | 12.5 | 12-20 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|--------|
| | | | | | +20°C | -20°C | -120°C |
| Required: AWS A5.4 | | not specified | min. 520 | min. 30 | not specified | | |
| EN ISO | | min. 320 | min. 510 | min. 25 | not specified | | |
| Typical values | AW | 480 | 560 | 40 | 60 | 50 | 40 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 40-75 |
| 3.2 x 350 | 60-110 |
| 4.0 x 350 | 80-150 |
| 5.0 x 350 | 140-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 100 | 2.0 | 528374-1 |
| 3.2 x 350 | SRP | 56 | 1.9 | 528367-1 |
| | CBOX | 125 | 4.2 | 528381-1 |
| 4.0 x 350 | CBOX | 84 | 4.2 | 528497-1 |

Arosta® 316L

TOP FEATURES

- Molybdenum level min. 2.7%
- High resistance to general and intergranular corrosion
- Smooth weld appearance
- Easy slag release
- Strong electrode coating

CLASSIFICATION

AWS A5.4 E316L-16
EN ISO 3581-A E 19 12 3 L R 12

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| ABS | LR | BV | DNV | TÜV | DB |
|-----|----|----|-----|-----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | Mo | FN (acc. WRC 1992) |
|------|-----|-----|------|------|------|--------------------|
| 0.02 | 0.8 | 0.8 | 18.0 | 11.5 | 2.85 | 4-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|--------|
| | | | | | +20°C | -20°C | -120°C |
| Required: AWS A5.4 | | not specified | min. 490 | min. 30 | not specified | | |
| EN ISO 3581-A | | min. 320 | min. 510 | min. 25 | not specified | | |
| Typical values | AW | 450 | 580 | 39 | | 60 | 40 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 1.5 x 250 | 20-40 |
| 2.0 x 300 | 30-50 |
| 2.5 x 350 | 40-75 |
| 3.2 x 350 | 60-110 |
| 4.0 x 350 | 80-150 |
| 5.0 x 350 | 140-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 1.5 x 250 | PE Tube | 145 | 1.0 | 529159-1 |
| 2.0 x 300 | CBOH | 170 | 1.9 | 529173-1 |
| 2.5 x 350 | SRP | 10 | 0.2 | 515236-1 |
| | SRP | 69 | 1.4 | 530001-1 |
| 3.2 x 350 | CBOH | 100 | 2.0 | 529180-1 |
| | SRP | 56 | 1.8 | 530032-1 |
| 4.0 x 350 | CBOX | 130 | 4.3 | 529487-1 |
| | CBOX | 84 | 4.5 | 529593-1 |
| 5.0 x 350 | CBOX | 50 | 4.1 | 529708-1 |

Clearosta® E 304L

TOP FEATURES

- Suitable for root pass
- Lower porosity, good striking and restriking
- Excellent slag removal

CLASSIFICATION

AWS A5.4 E308L-17
EN ISO 3581-A E 19 9 L R 22

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| | |
|-----|-----|
| DNV | TÜV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | P | S | FN (acc. WRC 1992) |
|------|-----|------|------|------|-------|------|--------------------|
| 0.03 | 0.8 | 1.00 | 19.5 | 10.0 | 0.025 | 0.01 | 5-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥420 | ≥520 | ≥35 | ≥50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 300 | 70-90 |
| 3.2 x 350 | 100-120 |
| 4.0 x 350 | 140-160 |
| 5.0 x 350 | 190-210 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 300 | VPMD | 90 | 1.7 | 710001 |
| 3.2 x 350 | VPMD | 55 | 1.9 | 710002 |
| 4.0 x 350 | VPMD | 40 | 2.1 | 710003 |
| 5.0 x 350 | VPMD | 20 | 1.6 | 710004 |

Clearosta® E 309L

TOP FEATURES

- Suitable for root pass
- Lower porosity, good striking and restriking
- Excellent slag removal

CLASSIFICATION

AWS A5.4 E 309L-17
EN ISO 3581-A E 23 12 L R 22

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| | |
|-----|-----|
| DNV | TÜV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | P | S | FN (acc. WRC 1992) |
|------|-----|------|------|------|-------|------|--------------------|
| 0.03 | 0.9 | 1.00 | 24.0 | 13.0 | 0.025 | 0.01 | 8-15 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥420 | ≥520 | ≥35 | ≥50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 300 | 70-90 |
| 3.2 x 350 | 100-120 |
| 4.0 x 350 | 140-160 |
| 5.0 x 350 | 190-210 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 300 | VPMD | 90 | 1.8 | 710005 |
| 3.2 x 350 | VPMD | 55 | 2.0 | 710006 |
| 4.0 x 350 | VPMD | 40 | 2.2 | 710007 |
| 5.0 x 350 | VPMD | 20 | 1.7 | 710008 |

Clearosta® E 316L

TOP FEATURES

- Suitable for root pass
- Lower porosity, good striking and restriking
- Excellent slag removal

CLASSIFICATION

AWS A5.4 E316L-17
EN ISO 3581-A E 19 12 3 L R 22

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

| | |
|-----|-----|
| DNV | TÜV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | Mo | P | S | FN (acc. WRC 1992) |
|------|-----|------|------|------|-----|-------|------|--------------------|
| 0.03 | 0.8 | 1.00 | 19.5 | 10.0 | 2.7 | 0.025 | 0.01 | 5-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥420 | ≥520 | ≥35 | ≥50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 300 | 70-90 |
| 3.2 x 350 | 100-120 |
| 4.0 x 350 | 140-160 |
| 5.0 x 350 | 190-210 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 300 | VPMD | 90 | 1.7 | 710009 |
| 3.2 x 350 | VPMD | 55 | 2.0 | 710010 |
| 4.0 x 350 | VPMD | 40 | 2.1 | 710011 |
| 5.0 x 350 | VPMD | 20 | 1.7 | 710012 |

Limarosta® 304L

TOP FEATURES

- Mirror like bead appearance
- Self releasing slag
- Excellent side wall wetting, no undercut
- High resistance to porosity
- Weldable on AC and DC

CLASSIFICATION

AWS A5.4 E308L-17
EN ISO 3581-A E 19 9 L R 12

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| LR | DNV | TÜV | DB |
|----|-----|-----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|-------|------|------|------|-----|--------------------|
| 0.025 | 0.75 | 0.95 | 19.0 | 9.7 | 4-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | +20°C | -20°C |
| Required: AWS A5.4 | | not specified | min. 520 | min. 35 | not specified | |
| EN ISO | | min. 320 | min. 510 | min. 30 | not specified | |
| Typical values | AW | 440 | 600 | 45 | 75 | 60 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.0 x 300 | 35-50 |
| 2.5 x 350 | 45-80 |
| 3.2 x 350 | 80-115 |
| 4.0 x 450 | 100-155 |
| 5.0 x 450 | 150-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.8 | 557312-1 |
| 2.5 x 350 | CBOH | 92 | 2.0 | 557329-1 |
| 3.2 x 350 | CBOX | 120 | 4.2 | 557367-1 |
| 4.0 x 450 | CBOX | 85 | 5.8 | 557398-1 |
| 5.0 x 450 | CBOX | 50 | 5.3 | 557404-1 |

Limarosta® 309S

TOP FEATURES

- Self releasing slag
- Excellent side wall wetting, no undercut, mirror like bead appearance
- High resistance to porosity

CLASSIFICATION

AWS A5.4 E 309L-17
EN ISO 3581-A E 23 12 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

| LR | DNV | TÜV | DB |
|----|-----|-----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|------|-----|-----|------|------|--------------------|
| 0.02 | 0.8 | 1.0 | 23.0 | 12.5 | 10-20 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | +20°C | -20°C |
| Required: AWS A5.4 | | not specified | min. 520 | min. 30 | not specified | |
| EN ISO | | min. 320 | min. 510 | min. 25 | not specified | |
| Typical values | AW | 440 | 600 | 40 | 55 | 50 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.0 x 300 | 35-55 |
| 2.5 x 350 | 45-80 |
| 3.2 x 350 | 80-115 |
| 4.0 x 350 | 100-155 |
| 5.0 x 350 | 150-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.8 | 557527-1 |
| 2.5 x 350 | SRP | 65 | 1.4 | 539684-1 |
| | CBOH | 90 | 2.0 | 557534-1 |
| 3.2 x 350 | SRP | 52 | 1.8 | 539714-1 |
| | CBOX | 120 | 4.2 | 557565-1 |
| 4.0 x 450 | SRP | 28 | 1.9 | 539691-1 |
| | CBOX | 81 | 5.6 | 557589-1 |
| 5.0 x 450 | CBOX | 50 | 5.4 | 557596-1 |

Limarosta® 316L

TOP FEATURES

- Molybdenum level min. 2.7%
- Mirror like bead appearance
- Self releasing slag
- Good side wall fusion, no undercut
- High resistance to porosity

CLASSIFICATION

AWS A5.4 E316L-17
EN ISO 3581-A E 19 12 3 L R 12

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

APPROVALS

| LR | DNV | TÜV | DB |
|----|-----|-----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | Mo | FN (acc. WRC 1992) |
|------|-----|-----|------|------|-----|--------------------|
| 0.02 | 0.8 | 1.0 | 18.0 | 11.5 | 2.8 | 4-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|--------------------|------------|---------------------------|------------------------|----------------|------------------|--------|---------|
| | | | | | +20° C | -20° C | -105° C |
| Required: AWS A5.4 | | not specified | min. 490 | min. 30 | not specified | | |
| EN ISO | | min. 320 | min. 510 | min. 25 | not specified | | |
| Typical values | AW | 450 | 580 | 40 | 70 | 60 | 40 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 1.5 x 250 | 20-40 |
| 2.0 x 300 | 35-50 |
| 2.5 x 350 | 45-80 |
| 3.2 x 350 | 80-115 |
| 4.0 x 450 | 100-155 |
| 5.0 x 450 | 150-220 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.7 | 557435-1 |
| | SRP | 65 | 1.4 | 539912-1 |
| 2.5 x 350 | CBOH | 90 | 2.0 | 557442-1 |
| | SRP | 52 | 1.8 | 539943-1 |
| 3.2 x 350 | CBOX | 120 | 4.2 | 557466-1 |
| | SRP | 28 | 1.9 | 539929-1 |
| 4.0 x 450 | CBOX | 81 | 5.5 | 557497-1 |
| | SRP | 22 | 2.4 | 539936-1 |
| 5.0 x 450 | CBOX | 52 | 5.6 | 557503-1 |

LINCOLN LINOX 308L

TOP FEATURES

- Smooth weld appearance
- Minimum spatter and high resistance to porosity
- Good side wall wetting, no undercut

CLASSIFICATION

AWS A5.4 E 308L-17
EN ISO 3581-A E 19 9 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | P | S | FN (acc. WRC 1992) | |
|-------|-----|-----|------|-----|--------|--------|--------------------|--|
| 0.025 | 0.9 | 0.8 | 19.8 | 9.5 | ≤0.030 | ≤0.025 | 5-10 | |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|---------------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥320 | ≥520 | ≥35 | ≥60 |

AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.7 | 620163 |
| | VPMD | 150 | 1.7 | 620166 |
| 2.5 x 300 | VPMD | 90 | 1.7 | 620203 |
| | CBOH | 90 | 2.0 | 620140 |
| 2.5 x 350 | VPMD | 90 | 2.0 | 620152 |
| | CBOH | 55 | 1.9 | 620141 |
| 3.2 x 350 | VPMD | 55 | 1.9 | 620153 |
| | CBOH | 40 | 2.8 | 620142 |
| 4.0 x 450 | VPMD | 40 | 2.8 | 620154 |
| | VPMD | 20 | 2.1 | 620155 |

LINOX 309L

TOP FEATURES

- Smooth weld appearance
- Minimum spatter and high resistance to porosity
- Good side wall wetting, no undercut

CLASSIFICATION

AWS A5.4 E 309L-17
EN ISO 3581-A E 23 12 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | P | S | FN (acc. WRC 1992) |
|--------|-----|-----|------|------|--------|--------|--------------------|
| ≤0.040 | 0.9 | 0.9 | 23.5 | 12.2 | ≤0.025 | ≤0.025 | 5-20 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥400 | ≥520 | ≥30 | ≥47 |

AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 90 | 2.0 | 620144 |
| | VPMD | 90 | 2.0 | 620156 |
| 3.2 x 350 | CBOH | 55 | 2.0 | 620145 |
| | VPMD | 55 | 2.5 | 620157 |
| 4.0 x 450 | VPMD | 40 | 3.3 | 620158 |

LINOX 316L

TOP FEATURES

- Smooth weld appearance
- Minimum spatter and high resistance to porosity
- Good side wall wetting, no undercut

CLASSIFICATION

AWS A5.4 E 316L-17
EN ISO 3581-A E 19 12 3 LR 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | Mo | P | S | FN (acc. WRC 1992) |
|-------|-----|-----|------|------|-----|--------|--------|--------------------|
| 0.035 | 0.9 | 0.8 | 19.0 | 12.0 | 2.6 | ≤0.025 | ≤0.025 | 44839 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | AW | ≥350 | ≥510 | ≥30 | ≥50 |

AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.7 | 620165 |
| | VPMD | 150 | 1.7 | 620168 |
| 2.5 x 300 | VPMD | 90 | 1.7 | 620202 |
| | CBOH | 90 | 2.0 | 620148 |
| 2.5 x 350 | VPMD | 90 | 2.0 | 620159 |
| | CBOH | 55 | 2.0 | 620149 |
| 3.2 x 350 | VPMD | 55 | 2.0 | 620160 |
| | CBOH | 40 | 2.8 | 620150 |
| 4.0 x 450 | VPMD | 40 | 3.1 | 620161 |
| | VPMD | 20 | 2.2 | 620162 |

LINOX P 308L

TOP FEATURES

- All positional welding including fixed pipework
- Smooth weld appearance
- Minimum spatter and high resistance to porosity

CLASSIFICATION

AWS A5.4 E 308L-16
EN ISO 3581-A E 19 9 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|-------|-----|-----|------|-----|--------------------|
| 0.025 | 0.8 | 0.6 | 19.0 | 9.5 | 3-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -100°C |
|--------------------|------------|----------------------|------------------------|----------------|-------------------------|
| Required: AWS A5.4 | | not specified | min. 520 | min. 35 | |
| EN ISO | | min. 310 | min. 510 | min. 30 | |
| Typical values | AW | 450 | 590 | 45 | 35 |

AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.6 | 620172 |
| | VPMD | 150 | 1.6 | 620176 |
| 2.5 x 350 | CBOH | 95 | 1.8 | 620173 |
| | VPMD | 95 | 1.8 | 620177 |
| 3.2 x 350 | CBOH | 55 | 1.7 | 620174 |
| | VPMD | 55 | 1.7 | 620178 |
| 4.0 x 450 | CBOH | 40 | 2.6 | 620175 |
| | VPMD | 40 | 2.6 | 620179 |

LINOX P 309L

TOP FEATURES

- All positional welding including fixed pipework
- Smooth weld appearance
- Minimum spatter and high resistance to porosity

CLASSIFICATION

AWS A5.4 E 309L-16
EN ISO 3581-A E 23 12 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|-------|-----|-----|------|------|--------------------|
| 0.025 | 0.8 | 0.6 | 23.5 | 13.0 | 8-20 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -20°C |
|--------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.4 | | not specified | min. 520 | min. 30 | not specified |
| EN ISO | | min. 320 | min. 510 | min. 25 | not specified |
| Typical values | AW | 495 | 595 | 41 | 45 |

AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CBOH | 95 | 1.9 | 620180 |
| | VPMD | 95 | 1.9 | 620183 |
| 3.2 x 350 | CBOH | 55 | 1.9 | 620181 |
| | VPMD | 55 | 1.9 | 620184 |

LINOX P 316L

TOP FEATURES

- All positional welding including fixed pipework
- Smooth weld appearance
- Minimum spatter and high resistance to porosity

CLASSIFICATION

AWS A5.4 E 316L-16
EN ISO 3581-A E 19 12 3 L R 32

CURRENT TYPE

AC/DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni | Mo | FN (acc. WRC 1992) |
|-------|-----|-----|------|------|-----|--------------------|
| 0.025 | 0.8 | 0.6 | 19.0 | 12.0 | 2.5 | 3-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|--------------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | +20 °C | -105 °C |
| Required: AWS A5.4 | | not specified | min. 520 | min. 30 | not specified | |
| EN ISO | | min. 320 | min. 510 | min. 25 | not specified | |
| Typical values | AW | 480 | 580 | 41 | 70 | 40 |

AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.0 x 300 | CBOH | 150 | 1.7 | 620186 |
| | VPMD | 150 | 1.7 | 620191 |
| 2.5 x 350 | CBOH | 95 | 1.9 | 620187 |
| | VPMD | 95 | 1.9 | 620192 |
| 3.2 x 350 | CBOH | 60 | 2.0 | 620188 |
| | VPMD | 60 | 2.0 | 620193 |
| 4.0 x 450 | VPMD | 40 | 2.7 | 620194 |

ALMN

TOP FEATURES

- Good weldability
- No porosity

CLASSIFICATION

AWS A5.3 E3003
EN ISO 18273-A Al 3103

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Al | Mn | Si | Zn | Fe | Cu | Mg | Others |
|------|---------|----------|-----------|----------|-----------|----------|-----------|
| bal. | 0.9-1.2 | 0.3 max. | 0.09 max. | 0.6 max. | 0.02 max. | 0.15 max | 0.15 max. |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|------------|---------------------------|------------------------|----------------|
| Typical values | AW | 40 | 110 | 20 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 40-70 |
| 3.2 x 350 | 60-90 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CAN | - | 2.0 | 809718 |
| 3.2 x 350 | CAN | - | 2.0 | 800579 |

AISi5

TOP FEATURES

- Good weldability, no porosity
- Shall be welded in DC+ mode

CLASSIFICATION

AWS A5.3 E 4043
EN ISO 18273-A EI-AISi5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Al | Si |
|------|-----|
| bal. | 5.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|------------|---------------------------|------------------------|----------------|
| Typical values | AW | 90 | 160 | 15 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 40-70 |
| 3.2 x 350 | 60-90 |
| 4.0 x 350 | 80-120 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CAN | - | 2.0 | 800593 |
| 3.2 x 350 | CAN | - | 2.0 | 800609 |

AlSi12

TOP FEATURES

- Also applicable as surfacing electrode
- Good weldability, no porosity
- Applicable when Al-properties are unknown

CLASSIFICATION

AWS A5.3 E 4047
EN ISO 18273-A EI-AlSi 12

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Al | Si |
|------|------|
| bal. | 12.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|------------|---------------------------|------------------------|----------------|
| Typical values | AW | 80 | 180 | 5 |

AW = As welded

OUTPUT RANGE

| Diameter x Length (mm) | Current range (A) |
|------------------------|-------------------|
| 2.5 x 350 | 40-70 |
| 3.2 x 350 | 60-90 |
| 4.0 x 350 | 80-120 |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Electrodes/pack | Net weight/pack (kg) | Item number |
|------------------------|-----------|-----------------|----------------------|-------------|
| 2.5 x 350 | CAN | - | 2.0 | 800623 |
| 3.2 x 350 | CAN | - | 2.0 | 800630 |
| 4.0 x 350 | CAN | - | 2.0 | 800647 |

GMAW CONSUMABLES
MIG/MAG WIRES



MILD STEEL

| | |
|--------------------------|-----|
| LNM 25 | 114 |
| Ultramag® | 115 |
| Ultramag® SG3 | 117 |
| Supramig® | 118 |
| Supramig® HD | 120 |
| Supramig® Ultra | 121 |
| Supramig® Ultra HD | 122 |

LOW ALLOY STEEL

| | |
|-------------------------|-----|
| LNM 12 | 123 |
| LNM 19 | 124 |
| LNM 20 | 125 |
| LNM 28 | 126 |
| LNM MoNi | 127 |
| LNM MoNiVa | 128 |
| LNM MoNiCr | 129 |
| LNM Ni1 | 130 |
| LNM Ni2.5 | 131 |
| Pipeliiner® 80Ni1 | 132 |

STAINLESS STEEL

| | |
|------------------|-----|
| LNM 304LSi | 133 |
| LNM 316LSi | 134 |
| LNM 309LSi | 135 |
| LNM 347Si | 136 |
| LNM 307 | 137 |
| LNM 309H | 138 |
| LNM 310 | 139 |
| LNM 318Si | 140 |
| LNM 4455 | 141 |

COPPER ALLOYS

| | |
|-----------------|-----|
| LNM CuAl8 | 142 |
| LNM CuSi3 | 143 |
| LNM CuSn | 144 |

ALUMINIUM

| | |
|-------------------------------|-----|
| SuperGlaze® MIG 4043 | 145 |
| SuperGlaze® MIG 4047 | 146 |
| SuperGlaze® MIG 5087 | 147 |
| SuperGlaze® MIG 5183 | 148 |
| SuperGlaze® MIG HD 5183 | 149 |
| SuperGlaze® MIG 5356 | 150 |
| SuperGlaze® MIG HD 5356 | 151 |
| SuperGlaze® MIG 5556A | 152 |
| SuperGlaze® MIG 5754 | 153 |

HARDFACING

| | |
|-----------------|-----|
| LNM 420FM | 154 |
|-----------------|-----|

GMAW
CONSUMABLES
MIG/MAG WIRES

LNM 25

TOP FEATURES

- Stable arc and excellent feedability
- Excellent mechanical properties
- Used mainly in single pass welding

TYPICAL APPLICATIONS

- General fabrication
- Automotive

CLASSIFICATION

AWS A5.18 ER70S-3
EN ISO 14341-A G 42 4 M21 2Si

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂

APPROVALS

| ABS | LR | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|-----|-----|
| 0.08 | 1.1 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | M21 | AW | 450 | 540 | 26 | 150 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|--------------|
| 0.8 | SPOOL (B300) | 16.0 | E08K016P1E01 |
| | SPOOL (B300) | 16.0 | E10K016P1E01 |
| 1.0 | DRUM | 250.0 | E10D250E1S01 |
| | SPOOL (B300) | 16.0 | E12K016P1E01 |
| 1.2 | DRUM | 250.0 | E12D250E1S01 |

Ultramag®

TOP FEATURES

- Good performances in terms of feedability and weldability
- Stable arc and low spatter
- High productivity

TYPICAL APPLICATIONS

- General Constructions
- Heavy Fabrication
- Infrastructures
- Automotive

CLASSIFICATION

| | |
|----------------|---|
| AWS A5.18 | ER70S-6 |
| EN ISO 14341-A | G42 3 C1 3Si1 / G46 4 M20 3Si1 / G46 4 M21 3Si1 |

SHIELDING GASES (ACC. EN ISO 14175)

| | |
|-----|---------------------------------------|
| M21 | Mixed gas Ar+ >15-25% CO ₂ |
| M20 | Mixed gas Ar+ >5-15% CO ₂ |
| C1 | Active gas 100% CO ₂ |

APPROVALS

| ABS | LR | DNV | TÜV | DB | CE |
|-----|----|-----|-----|----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|------|------|
| 0.08 | 1.40 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | -30° C | -40° C |
| Typical values | M21 | AW | 470 | 570 | 24 | | 170 |
| | C1 | AW | 450 | 550 | 25 | 71 | 130 |

* AW = As welded

Ultramag®

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) |
|--------------------|---------------|--------------|
| 0.6 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| 0.8 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0 |
| 0.9 | DRUM | 250.0 |
| 1.0 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.2 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.4 | DRUM | 500.0 |
| 1.6 | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |

MIG/MAG

Ultramag® SG3

TOP FEATURES

- Good performances in terms of feedability and weldability
- Stable arc and low spatter
- High productivity

TYPICAL APPLICATIONS

- General Constructions
- Heavy Fabrication
- Infrastructures
- Automotive

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 14341-A G46 3 C1 4Si1 / G46 5 M20 4Si1 / G46 5 M21 4Si1

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
M20 Mixed gas Ar+ >5-15% CO₂
C1 Active gas 100% CO₂

APPROVALS

| ABS | LR | DNV | TÜV | DB | CE |
|-----|----|-----|-----|----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|------|------|
| 0.08 | 1.70 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -40°C | -50°C |
| Typical values | M21 | AW | 490 | 590 | 25 | | 90 |
| | C1 | AW | 480 | 570 | 26 | 180 | |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) |
|--------------------|---------------|--------------|
| 0.8 | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| | | |
| 1.0 | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| | | |
| 1.2 | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |

Supramig®

TOP FEATURES

- Excellent feedability and very consistent welding performance
- Tight and stable arc with extremely low spatter
- Smooth bead profile and best appearance
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General Constructions
- Heavy Fabrication
- Infrastructures
- Automotive
- Robotics

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 14341-A G42 3 C1 3Si1 / G46 4 M21 3Si1

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂

APPROVALS

| ABS | LR | BV | DNV | TÜV | DB | CWB | CE |
|-----|----|----|-----|-----|----|-----|----|
| + | + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|------|------|
| 0.08 | 1.40 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | -30 °C | -40 °C |
| Typical values | M21 | AW | 480 | 570 | 28 | | 120 |
| | C1 | AW | 440 | 550 | 29 | 70 | 95 |

* AW = As welded

Supramig®

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) |
|--------------------|---------------|--------------|
| 0.8 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | DRUM | 250.0 |
| 0.9 | DRUM | 250.0 |
| 1.0 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0, 18.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.2 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0, 18.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.4 | DRUM | 250.0 |
| 1.6 | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | DRUM | 250.0 |

MIG/MAG

Supramig® HD

TOP FEATURES

- Excellent feedability and very consistent welding performance
- Self releasing silicate islands
- Tight and stable arc with extremely low spatter
- Deep root penetration and improved fatigue life
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General Constructions
- Heavy Fabrication
- Infrastructures
- Automotive
- Robotics

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 14341-A G42 3 C1 3Si1 / G46 4 M21 3Si1

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂

APPROVALS

| ABS | LR | BV | DNV | RINA | TÜV | DB | CWB | CE |
|-----|----|----|-----|------|-----|----|-----|----|
| + | + | + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|------|------|
| 0.08 | 1.40 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -30°C | -40°C |
| Typical values | M21 | AW | 480 | 570 | 28 | | 120 |
| | C1 | AW | 440 | 550 | 29 | 70 | 95 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) |
|--------------------|---------------|--------------|
| 1.0 | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.2 | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.32 | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0 |
| 1.6 | SPOOL (B300) | 16.0 |
| | DRUM | 250.0 |

Supramig® Ultra

TOP FEATURES

- Excellent feedability and very consistent welding performance
- Tight and stable arc with extremely low spatter
- Smooth bead profile and best appearance
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General Constructions
- Heavy Fabrication
- Infrastructures
- Automotive
- Robotics

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 14341-A G46 3 C1 4Si1 / G50 5 M21 4Si1

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂

APPROVALS

| ABS | BV | DNV | TÜV | DB | CE |
|-----|----|-----|-----|----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|------|------|
| 0.08 | 1.70 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|--------|
| | | | | | | -20 °C | -40 °C | -50 °C |
| Typical values | M21 | AW | 500 | 600 | 25 | 80 | 110 | 70 |
| | C1 | AW | 480 | 590 | 26 | 120 | 140 | |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) |
|--------------------|---------------|--------------|
| 0.8 | SPOOL (B300) | 16.0 |
| | SPOOL (S200) | 5.0 |
| 1.0 | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0, 18.0 |
| | DRUM | 250.0, 500.0 |
| | SPOOL (S300) | 15.0 |
| 1.2 | SPOOL (B300) | 16.0, 18.0 |
| | SPOOL (B5300) | 16.0, 18.0 |
| | DRUM | 250.0, 500.0 |
| | SPOOL (S300) | 15.0 |
| 1.4 | DRUM | 250.0 |
| | DRUM | 250.0, 500.0 |
| 2.0 | DRUM | 500.0 |

Supramig® Ultra HD

TOP FEATURES

- Excellent feedability and very consistent welding performance
- Self releasing silicate islands
- Tight and stable arc with extremely low spatter
- Deep root penetration and improved fatigue life
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General Constructions
- Heavy Fabrication
- Infrastructures
- Automotive
- Robotics

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 14341-A G46 3 C1 4Si1 / G50 5 M21 4Si1

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂

APPROVALS

| ABS | BV | DNV | TÜV | DB | CE |
|-----|----|-----|-----|----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|------|------|
| 0.08 | 1.70 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -20°C | -40°C |
| Typical values | M21 | AW | 500 | 600 | 25 | 80 | 110 |
| | C1 | AW | 480 | 590 | 26 | 120 | 140 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) |
|--------------------|---------------|--------------|
| 1.0 | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.2 | SPOOL (S200) | 5.0 |
| | SPOOL (S300) | 15.0 |
| | SPOOL (B300) | 16.0, 18.0 |
| | SPOOL (BS300) | 16.0, 18.0 |
| | DRUM | 250.0, 500.0 |
| 1.32 | SPOOL (B300) | 16.0 |
| | SPOOL (BS300) | 16.0 |
| | DRUM | 250.0, 500.0 |
| 1.4 | SPOOL (B300) | 16.0 |
| | DRUM | 250.0, 500.0 |

LNМ 12

TOP FEATURES

- Used for welding low alloy creep resistant ferritic steels and fine grained steels
- Ideal for low temperature applications in the as welded condition with service temperatures in range -30°C to +500°C
- Recommended for welding 0.5% Mo low-alloy steels and for high strength steels.

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Petrochemical
- Chemical

CLASSIFICATION

AWS A5.28 ER70S-A1
 EN ISO 14341-A G 46 3 M21 2Mo
 EN ISO 21952-A G MoSi

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
 C1 Active gas 100% CO₂

APPROVALS

| | |
|------------|-----------|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| | | | |
|----------|-----------|-----------|-----------|
| C | Mn | Si | Mo |
| 0.1 | 1.12 | 0.6 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | +20°C | -20°C |
| Typical values | M21 | AW | 503 | 606 | 24 | 130 | 74 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 0.8 | SPOOL (B300) | 15.0 | 580914 |
| 1.0 | SPOOL (B300) | 15.0 | 581133 |
| 1.2 | SPOOL (B300) | 15.0 | 580921 |

LNM 19

TOP FEATURES

- Also suitable where some resistance to hydrogen attack by sulphur bearing crude oil is required
- Excellent mechanical characteristics.
- Can also be used to weld 0.9% Cr and 0.5% Mo steels.

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Pressure vessels
- Chemical
- Boilers, plates, tubes steels

CLASSIFICATION

AWS A5.28 ER80S-G*
EN ISO 21952-A G CrMo15i

* Nearest classification ER80S-B2

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Mo |
|-----|-----|-----|-----|-----|
| 0.1 | 1.0 | 0.5 | 1.2 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|---------------|----------------------|------------------------|----------------|------------------------|
| Typical values | M21 | PWHT 700°C/1h | 530 | 635 | 23 | 160 |

* PWHT = Post Weld Heat Treatment

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.0 | SPOOL (B300) | 15.0 | 581089 |
| 1.2 | SPOOL (B300) | 15.0 | 581065 |

LNМ 20

TOP FEATURES

- Deposit insensitive to cracking.
- Good radiographic quality.

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Pressure vessels
- Chemical
- Boilers, plates, tubes steels

CLASSIFICATION

AWS A5.28 ER90S-G*
EN ISO 21952-A G CrMo2Si

*Nearest classification ER90S-B3

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Mo |
|------|-----|-----|-----|-----|
| 0.08 | 0.9 | 0.6 | 2.5 | 1.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|---------------|----------------------|------------------------|----------------|------------------------|
| Typical values | M21 | PWHT 690°C/1h | 560 | 680 | 20 | 100 |

* PWHT = Post Weld Heat Treatment

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.0 | SPOOL (B300) | 15.0 | 581164 |
| 1.2 | SPOOL (B300) | 15.0 | 581157 |

LNM 28

TOP FEATURES

- Due to the alloying system, it can also be used for welding of high yield strength steels.
- Contains a small percentage of copper to help preventing further oxidation of the weld bead
- Excellent mechanical characteristics and resistance to corrosion.

TYPICAL APPLICATIONS

- Infrastructures
- Transmission towers, barriers, ducting, chimneys
- Exhaust Systems

CLASSIFICATION

AWS A5.28 ER 80S-G
EN ISO 16834-A G Z Mn3Ni1Cu*

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
C1 Active gas 100% CO₂

APPROVALS

| LR | DNV | DB | CE |
|----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cu |
|-----|-----|------|-----|-----|
| 0.1 | 1.4 | 0.75 | 0.8 | 0.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -20°C | -40°C |
| Typical values | M21 | AW | 570 | 620 | 25 | 90 | 70 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|----------------------|---------------|-------------------------------|
| 1.0 | SPOOL (B300) | 16.0 | S10K016PCE01, S10K016PCX01 |
| 1.2 | SPOOL (B300) DRUM | 16.0 250.0 | S12K016PCE01 S12D250ECS01 |

LNM MoNi

TOP FEATURES

- The weld metal contains less than 1% Ni conforming to NACE requirement.
- For welding high yield strength steels.

TYPICAL APPLICATIONS

- Infrastructures
- Earthmoving
- Cranes
- Structural Steels

CLASSIFICATION

AWS A5.28 ER100S-G
EN ISO 16834-A G 62 4 M21 Mn3NiCrMo

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %, TYPICAL, WIRE)

| C | Mn | Si | Ni | Cr | Mo | Cu |
|------|------|------|------|------|------|------|
| 0.10 | 1.65 | 0.75 | 0.55 | 0.60 | 0.30 | 0.08 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|--------|
| | | | | | | -20 °C | -40 °C | -60 °C |
| Typical values | M21 | AW | 635 | 770 | 19 | 100 | 90 | 70 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.0 | SPOOL (B300) | 15.0 | 580822 |
| 1.2 | SPOOL (B300) | 15.0 | 580839 |

LNM MoNiVa

TOP FEATURES

- Excellent mechanical properties.
- For low temperature applications down to -40°C.
- Low heat inputs are recommended to obtain optimum joint mechanical properties.

TYPICAL APPLICATIONS

- Infrastructures
- Earthmoving
- Cranes
- Structural Steels

CLASSIFICATION

AWS A5.28 ER110S-G
EN ISO 16834-A G 69 4 M21 Mn3Ni1CrMo

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cr | Mo | V | Cu |
|------|-----|------|------|------|-----|------|------|
| 0.08 | 1.7 | 0.44 | 1.35 | 0.23 | 0.3 | 0.08 | 0.25 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | M21 | AW | 710 | 790 | 20 | 70 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|--------------|
| 0.8 | SPOOL (B5300) | 15.0 | 581218 |
| 1.0 | SPOOL (B300) | 16.0 | S10K016PME01 |
| | DRUM | 250.0 | S10D250EMS01 |
| 1.2 | SPOOL (S300) | 15.0 | S12P015PMC01 |
| | SPOOL (B300) | 16.0 | S12K016PME01 |
| 1.4 | DRUM | 250.0 | S12D250EMS01 |
| | DRUM | 250.0 | S14D250EMS01 |

LNM MoNiCr

TOP FEATURES

- Excellent mechanical properties.
- Up to 890 MPa yield strength steels
- Can be used for low temperature applications up to -40°C.

TYPICAL APPLICATIONS

- Infrastructures
- Earthmoving
- Cranes
- Structural Steels

CLASSIFICATION

AWS A5.28 ER120S-G
EN ISO 16834-A G 89 4 M21 Mn4Ni2CrMo

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cr | Mo |
|------|-----|------|------|------|------|
| 0.09 | 1.8 | 0.80 | 2.20 | 0.30 | 0.55 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -40°C | -60°C |
| Typical values | M21 | AW | >890 | 950 | >15 | 70 | >50 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 0.8 | SPOOL (BS300) | 15.0 | 580584 |
| 1.0 | SPOOL (BS300) | 15.0 | 580587 |
| 1.2 | SPOOL (BS300) | 15.0 | 580594 |

LNM Ni1

TOP FEATURES

- Ideal for low temperature applications.
- The weld metal contains less than 1% Ni conforming to NACE requirements
- Stable arc and excellent feedability

TYPICAL APPLICATIONS

- LNG
- Cryogenic Applications
- Pipelaying

CLASSIFICATION

AWS A5.28 ER80S-Ni1
EN ISO 14341-A G 46 5 M21 3Ni1

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni |
|------|-----|-----|-----|
| 0.09 | 1.2 | 0.6 | 0.9 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -60°C | -20°C |
| Typical values | M21 | AW | 480 | 580 | 30 | 60 | |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (B5300) | 15.0 | 582468 |
| 1.2 | SPOOL (B5300) | 15.0 | 582482 |

LNM Ni2.5

TOP FEATURES

- Ideal for low temperature applications.
- Excellent mechanical characteristic both when welded and after stress relieving.
- High impact value at low temperature (-60°C as welded and -90°C after stress relieving 15h/580°C)

TYPICAL APPLICATIONS

- LNG
- Cryogenic Applications

CLASSIFICATION

AWS A5.28 ER80S-Ni2
EN ISO 14341-A G46 6 M21 2Ni2

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni |
|-----|-----|------|-----|
| 0.1 | 1.1 | 0.55 | 2.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -60°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | M21 | AW | 490 | 580 | 24 | 85 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (BS300) | 15.0 | 580372 |
| 1.2 | SPOOL (BS300) | 15.0 | 583632 |

Pipeliner® 80Ni1

TOP FEATURES

- Root pass capability up to X100 and hot, fill and cap pass up to X80 grade pipe
- Impact toughness capable of exceeding 69 - 95 J (51 - 70 ft-lbf) at -50°C (-58°F)
- Q2 Lot® - Certificate showing actual deposit chemistry available online
- Excellent wire placement for narrow groove welding
- ProTech® packaging system

TYPICAL APPLICATIONS

- Root pass welding on up to X100 grade pipe
- Hot, fill and cap pass welding on up to X80 grade pipe
- Pipeline
- Offshore

CLASSIFICATION

AWS A5.28 ER80S-G
EN ISO 14341-A G 3Ni1

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M20/M21 Mixed gas 75-95% Ar/Balance CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | P | S | Ni | Mo | Ti | Al |
|------|------|------|------|------|------|-------|------|-------|
| 0.07 | 1.55 | 0.70 | 0.11 | 0.10 | 0.90 | <0.01 | 0.08 | <0.01 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Required: AWS A5.28 | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|------------------------|---------------|------------|-------------------------|---------------------------|-------------------|------------------|-------|
| | | | | | | -29°C | -50°C |
| | | | | min. 550 | | | |
| | C1 | AW | 600 | 665 | 28 | 80 | 45 |
| | M20 | AW | 650 | 730 | 27 | 110 | 70 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|-----------------------|-----------|----------------|-------------|
| 1.0 | SPOOL | 4.5 | ED033119 |
| | SPOOL | 15.0 | ED033121 |
| 1.2 | SPOOL | 4.5 | ED033122 |
| | SPOOL | 15.0 | ED033120 |

LNМ 304LSi

TOP FEATURES

- The low carbon reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.
- Better weldability and appearance

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Vessel construction
- Cladding

CLASSIFICATION

AWS A5.9 ER308LSi
EN ISO 14343-A G 19.9 LSi

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| DNV | TÜV | DB | CE |
|-----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|----|----|-----|
| 0.02 | 1.9 | 0.8 | 20 | 10 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | | +20°C | -40°C |
| Typical values | M12 | AW | 394 | 568 | 40 | 85 | 41 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 0.8 | SPOOL (S200) | 5.0 | 581381 |
| | SPOOL (BS300) | 15.0 | 581386 |
| 1.0 | SPOOL (S200) | 5.0 | 581391 |
| | SPOOL (BS300) | 15.0 | 581393 |
| | DRUM | 250.0 | 581287 |
| 1.2 | SPOOL (BS300) | 15.0 | 581409 |
| | DRUM | 250.0 | 581362 |
| 1.6 | SPOOL (BS300) | 15.0 | 581416 |

LNM 316LSi

TOP FEATURES

- The higher Si level results in a smooth weld bead shape and even appearance with excellent toe blending particularly in fillet welds.
- The weld metal has a high resistance to pitting and crevice corrosion by non-oxidising acids.
- Used for applications with service temperatures <400°C.

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Shipbuilding
- Cladding

CLASSIFICATION

AWS A5.9 ER316LSi
EN ISO 14343-A G 19 12 3 LSi

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| DNV | TÜV | DB | CE |
|-----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.01 | 1.8 | 0.8 | 18.5 | 12.2 | 2.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|--------|--------|
| | | | | | | +20°C | -120°C | -196°C |
| Typical values | M12 | AW | 452 | 580 | 30 | 150 | 70 | 44 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 0.8 | SPOOL (S200) | 5.0 | 580631 |
| | SPOOL (BS300) | 15.0 | 581423 |
| | SPOOL (S300) | 15.0 | 581426 |
| 0.9 | SPOOL (BS300) | 15.0 | 581428 |
| | SPOOL (S200) | 5.0 | 580440 |
| 1.0 | SPOOL (BS300) | 15.0 | 581430 |
| | DRUM | 250.0 | 581263 |
| | SPOOL (BS300) | 15.0 | 581447 |
| 1.2 | DRUM | 250.0 | 581270 |

LNM 309LSi

TOP FEATURES

- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.
- Also used for the welding of clad steels where service temperatures are below 300°C.

TYPICAL APPLICATIONS

- General fabrication
- Transport
- Process Industries

CLASSIFICATION

AWS A5.9 ER309LSi
EN ISO 14343-A G 23 12 L Si

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| DNV | TÜV | DB | CE |
|-----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|------|------|------|
| 0.02 | 1.8 | 0.8 | 23.3 | 13.8 | 0.14 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|-------|
| | | | | | | +20°C | -20°C |
| Typical values | M12 | AW | 436 | 582 | 37 | 87 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 0.8 | SPOOL (BS300) | 15.0 | 581669 |
| | SPOOL (BS300) | 15.0 | 581770 |
| 1.0 | SPOOL (BS300) | 15.0 | 595789 |
| | SPOOL (S300) | 15.0 | 595792 |
| | DRUM | 250.0 | 581708 |
| 1.2 | SPOOL (BS300) | 15.0 | 595796 |
| | SPOOL (S300) | 15.0 | 595794 |
| | DRUM | 250.0 | 581710 |

LNМ 347Si

TOP FEATURES

- The weld metal has a high resistance to corrosive media at service temperatures <400°C.
- The presence of niobium reduces the propensity of intergranular chromium carbide precipitation and thus reduces the susceptibility to intergranular corrosion.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.

TYPICAL APPLICATIONS

- Process Industries
- Pharmaceutical Equipment
- High Temperature Stainless Applications

CLASSIFICATION

AWS A5.9 ER347Si
EN ISO 14343-A G 19 9 NbSi

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo | Nb |
|------|-----|-----|------|-----|-----|-----|
| 0.05 | 1.4 | 0.7 | 19.2 | 9.9 | 0.1 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20°C | -196°C |
| Typical values | M12 | AW | 460 | 650 | 35 | 100 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (BS300) | 15.0 | 581249 |
| | DRUM | 250.0 | 581257 |
| 1.2 | SPOOL (BS300) | 15.0 | 581256 |
| | DRUM | 250.0 | 581258 |

LNМ 307

TOP FEATURES

- The increased silicon content promotes weld pool fluidity resulting in a smoother weld deposit.
- Useful in case of difficult weldability.
- Often used as a buffer layer for hardfacing applications

TYPICAL APPLICATIONS

- Hardfacing
- Exhaust Systems
- Dissimilar joints
- Quenched and tempered steels

CLASSIFICATION

AWS A5.9 ER307*
EN ISO 14343-A G 18 8 Mn

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni |
|------|-----|-----|------|-----|
| 0.07 | 7.1 | 0.8 | 18.6 | 8.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------------|
| Typical values | M12 | AW | 400 | 630 | 40 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 0.8 | SPOOL (BS300) | 15.0 | 581901 |
| | SPOOL (BS300) | 15.0 | 581904 |
| 1.0 | DRUM | 250.0 | 581959 |
| | SPOOL (BS300) | 15.0 | 581911 |
| 1.2 | DRUM | 250.0 | 581914 |

LNМ 309H

TOP FEATURES

- High resistance to oxidation up to 1050°C
- High carbon content

TYPICAL APPLICATIONS

- Furnaces Fabrication

CLASSIFICATION

AWS A5.9 ER309

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.08 | 1.8 | 0.4 | 23.6 | 13.2 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------------|
| Typical values | M12 | AW | 400 | 640 | 35 | 110 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (BS300) | 15.0 | 595765 |

LNМ 310

TOP FEATURES

- High temperature ductility and excellent resistance to oxidation at working temperatures <1000°C.
- The weld deposit is fully austenitic
- Excellent corrosion resistance even when hot.

TYPICAL APPLICATIONS

- Petrochemical
- Heat Exchangers
- Hot water boilers
- Furnaces Fabrication

CLASSIFICATION

AWS A5.9 ER310
EN ISO 14343-A G 25 20

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo |
|-----|-----|------|----|----|-----|
| 0.1 | 1.7 | 0.45 | 26 | 21 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------------|
| Typical values | M12 | AW | 355 | 610 | 35 | 110 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (B5300) | 15.0 | 595871 |
| 1.2 | SPOOL (B5300) | 15.0 | 581935 |

LNM 318Si

TOP FEATURES

- High resistance to intergranular corrosion and general corrosion conditions
- The increased silicon results in increased weld pool fluidity to give a smooth deposit appearance.
- The presence of the stabilizer improves resistance to precipitation of chromium carbides.

TYPICAL APPLICATIONS

- Fabrication of pipes, plates, vessels

CLASSIFICATION

AWS A5.9 ER318*
EN ISO 14343-A G 19 12 3 NbSi

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo | Nb |
|------|-----|-----|------|------|-----|-----|
| 0.05 | 1.4 | 0.7 | 18.6 | 11.7 | 2.5 | 0.7 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------------|
| Typical values | M12 | AW | 410 | 630 | 35 | 100 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (BS300) | 15.0 | 596014 |

LNM 4455

TOP FEATURES

- Not susceptible for hot cracking

TYPICAL APPLICATIONS

- Non-magnetic applications
- Cryogenic Applications
- LNG

CLASSIFICATION

AWS A5.9 ER316LMn
EN ISO 14343-A G 20 16 3 Mn N L

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo | Nb |
|-------|----|-----|----|----|-----|------|
| 0.015 | 7 | 0.4 | 20 | 16 | 3.0 | 0.15 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -196°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|-------------------------|
| Typical values | M12 | AW | 400 | 600 | 30 | 50 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.0 | SPOOL (BS300) | 15.0 | 692125 |
| 1.2 | SPOOL (BS300) | 15.0 | 692129 |
| 1.6 | SPOOL (BS300) | 15.0 | 692136 |

LNМ CuAl8

TOP FEATURES

- Used for welding galvanized steel sheets and components in the automobile industry.
- It is an iron-free aluminum bronze, which composition offers a very high resistance to sea water-corrosion and to the most commonly used acids in any concentrations and at a wide range of operating temperatures.
- High erosion resistance.

TYPICAL APPLICATIONS

- Automotive components
- Galvanized Steels

CLASSIFICATION

AWS A5.7 ERCuAl-A1
EN ISO 24373-A S Cu 6100 (CuAl7)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Cu | Al | Mn |
|------|----|-----|
| bal. | 8 | 0.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Hardness (HB) |
|----------------|---------------|------------|---------------------------|------------------------|----------------|---------------|
| Typical values | I1 | AW | 185 | 430 | 30 | 95 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.0 | SPOOL (B300) | 12.0 | 582871 |
| | DRUM | 200.0 | 582875 |
| 1.2 | SPOOL (B300) | 12.0 | 581478 |
| | DRUM | 200.0 | 581480 |

LNМ CuSi3

TOP FEATURES

- This wire is frequently used for joining in artistic foundries, for welding galvanized sheets and even as a steel cladding.
- It is also suitable for surfaces subject to corrosion.
- Used also for GMA Brazing where a very small active component is suggested in the shielding gas.

TYPICAL APPLICATIONS

- Cladding
- Brazing
- Automotive

CLASSIFICATION

AWS A5.7 ERCuSi-A
EN ISO 24373-A S Cu 6560 (CuSi3Mn1)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Cu | Sn | Mn | Si | Zn |
|------|-----|-----|-----|-----|
| bal. | 0.1 | 1.0 | 3.0 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Hardness (HB) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|---------------|------------------------|
| Typical values | I1 | AW | 120 | 350 | 40 | 95 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 0.8 | SPOOL (S200) | 5.0 | 587012 |
| | SPOOL (BS300) | 12.0 | 587029 |
| 1.0 | SPOOL (BS300) | 12.0 | 587036 |
| | SPOOL (BS300) | 12.0 | 587039 |

LNM CuSn

TOP FEATURES

- Solid wire for welding of copper
- Widely used in oven soldering.

CLASSIFICATION

AWS A5.7 ERCu
EN ISO 24373-A S Cu 1898 (CuSn1)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Cu | Mn | Si | Sn | Ni |
|------|-----|-----|-----|-----|
| bal. | 0.2 | 0.3 | 0.8 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Hardness (HB) |
|----------------|---------------|------------|---------------------------|------------------------|----------------|---------------|
| Typical values | I1 | AW | 100 | 220 | 60 | 35 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 12.0 | 580945 |

SuperGlaze® MIG 4043

TOP FEATURES

- Designed for welding heat-treatable base alloys and more specifically the 6XXX series alloys
- Lower melting point and more fluidity than the 5XXX series filler alloys
- Low sensitivity to weld cracking with the 6XXX series base alloys

TYPICAL APPLICATIONS

- For welding 6XXX alloys, and most casting alloys
- Automotive components such as frame and drive shafts
- Bicycle frames

CLASSIFICATION

| | |
|----------------|--------------------|
| AWS A5.10 | ER4043 |
| EN ISO 18273-A | S Al 4043A (AlSi5) |

SHIELDING GASES (ACC. EN ISO 14175)

| | |
|-----------|--------------------------|
| I1 | Inert gas Ar (100%) |
| I3 | Inert gas Ar+ 0.5-95% He |
| Flow rate | 14.2-23.6 l/min |

APPROVALS

| | | |
|-----|----|----|
| TÜV | DB | CE |
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Zn | Ti | Be |
|------|------|------|------|------|------|-------|------|---------|
| bal. | 5.26 | 0.15 | 0.01 | 0.01 | 0.03 | 0.001 | 0.01 | <0.0002 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Typical values | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| | I1 | AW | 20-40 | 120-165 | 3-18 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.0 | SPOOL | 7.0 | ED701753 |
| | SPOOL | 7.3 | ED702747 |
| 1.2 | SPOOL | 7.0 | ED701754 |
| | SPOOL | 7.3 | ED702748 |
| | DRUM | 136.0 | ED036610 |
| 1.6 | SPOOL | 7.0 | ED701755 |
| | DRUM | 136.0 | ED036611 |

SuperGlaze® MIG 4047

TOP FEATURES

- Substitute for 4043 to increase Silicon in weld metal
- Minimize hot cracking to produce higher fillet weld shear strength
- Cosmetic appearing welds
- Lower melting point and higher fluidity than 4043 wires

TYPICAL APPLICATIONS

- Automotive components
- Heat Exchangers
- Body panels
- Brazing of aluminum sheets, extrusions and castings

CLASSIFICATION

AWS A5.10 ER4047
EN ISO 18273-A S Al 4047 (AlSi12)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Zn | Be |
|------|-------|----------|-----------|-----------|-----------|-----------|--------|
| bal. | 11-13 | max. 0.8 | max. 0.30 | max. 0.15 | max. 0.10 | max. 0.20 | 0.0003 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Typical values | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| | I1 | AW | 60-80 | 130-190 | 5-20 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.2 | DRUM | 136.0 | ED036613 |
| 1.6 | DRUM | 136.0 | ED036612 |

SuperGlaze® MIG 5087

TOP FEATURES

- Designed to meet the tensile strength requirements of high magnesium alloys
- For base metals with a max. of 5% Mg
- The presence of Zirconium produces a fine-grained weld metal structure
- Reduced tendency of solidification cracking in highly restrained welds

TYPICAL APPLICATIONS

- Marine
- Cryogenic Applications
- Shipbuilding
- Automotive
- Railway Industry

CLASSIFICATION

AWS A5.10 ER5087
EN ISO 18273-A S Al 5087 (AlMg4,5MnZr)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| TÜV | DB |
|-----|----|
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Mn | Mg | Cr | Ti | Zr | Be |
|------|------|------|-----|-----|------|------|------|--------|
| bal. | 0.06 | 0.13 | 0.7 | 4.9 | 0.07 | 0.01 | 0.12 | 0.0002 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Typical values | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| | I1 | AW | 125-140 | 275-300 | 17-30 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.2 | SPOOL | 7.3 | ED703574 |

SuperGlaze® MIG 5183

TOP FEATURES

- Designed for applications where higher strength is required
- For 5083 and 5456 base materials
- Excellent corrosion resistance ideal for Ship building and marine applications

TYPICAL APPLICATIONS

- Marine fabrication and repair
- Cryogenic tanks
- Shipbuilding
- Bicycle frames
- Railing industry

CLASSIFICATION

AWS A5.10 ER5183
EN ISO 18273-A S Al 5183 (AlMg4.5Mn0.7(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| ABS | LR | BV | DNV | RINA | TÜV | DB | CE |
|-----|----|----|-----|------|-----|----|----|
| + | + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Be |
|------|------|------|-------|------|------|------|------|------|--------|
| bal. | 0.03 | 0.13 | 0.001 | 0.65 | 4.99 | 0.10 | 0.02 | 0.07 | 0.0002 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 125-165 | 270-290 | 16-25 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.0 | SPOOL | 7.0 | ED701901 |
| 1.2 | SPOOL | 7.0 | ED701758 |
| | DRUM | 136.0 | ED034791 |
| 1.6 | SPOOL | 7.0 | ED701759 |
| | DRUM | 136.0 | ED034792 |

SuperGlaze® MIG HD 5183

TOP FEATURES

- Designed for heavy duty applications
- Reduced shavings and improved feedability
- Used on 5083 and 5456 base materials
- Also used on most 5XXX and 6XXX base materials
- Excellent corrosion resistance for marine applications

CLASSIFICATION

AWS A5.10 ER5183
EN ISO 18273-A S Al 5183 (AlMg4.5Mn0.7(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min (for Argon)

APPROVALS

| ABS | LR | BV | RINA | TÜV | DB | CE |
|-----|----|----|------|-----|----|----|
| + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Be |
|------|------|------|-------|------|------|------|------|------|--------|
| bal. | 0.03 | 0.13 | 0.001 | 0.65 | 4.99 | 0.10 | 0.02 | 0.07 | 0.0002 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 125-165 | 270-290 | 16-25 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 0.9 | SPOOL | 7.3 | ED035690 |
| | SPOOL | 9.1 | ED035691 |
| | DRUM | 136.0 | ED036341 |
| 1.2 | SPOOL | 9.1 | ED035693 |
| | SPOOL | 7.3 | ED035694 |
| 1.6 | SPOOL | 9.1 | ED035695 |
| | DRUM | 136.0 | ED036343 |

SuperGlaze® MIG 5356

TOP FEATURES

- General purpose filler alloy for 5XXX and 6XXX series alloys
- The most widely used welding alloy
- High strength filler metal

TYPICAL APPLICATIONS

- Shipbuilding
- Railway Industry
- Automotive
- Storage tanks

CLASSIFICATION

AWS A5.10 ER5356
EN ISO 18273-A S Al 5356 (AlMg5Cr(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| ABS | LR | BV | DNV | RINA | TÜV | DB | CWB | CE |
|-----|----|----|-----|------|-----|----|-----|----|
| + | + | + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Be |
|------|------|------|------|------|------|------|-------|------|--------|
| bal. | 0.05 | 0.09 | 0.03 | 0.12 | 4.90 | 0.08 | <0.01 | 0.15 | 0.0002 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Typical values | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| | I1 | AW | 110-120 | 240-296 | 17-26 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 0.8 | SPOOL | 7.0 | ED701762 |
| | SPOOL | 2.0 | ED703753 |
| 1.0 | SPOOL | 7.0 | ED701763 |
| | SPOOL | 7.3 | ED702736 |
| | SPOOL | 2.0 | ED702755 |
| 1.2 | SPOOL | 7.0 | ED701764 |
| | SPOOL | 7.3 | ED702737 |
| | DRUM | 136.0 | ED034550 |
| 1.6 | SPOOL | 7.0 | ED701765 |

SuperGlaze® MIG HD 5356

TOP FEATURES

- Designed for heavy duty applications
- Reduced shavings and improved feedability
- General purpose filler alloy for welding 5XXX series alloys

TYPICAL APPLICATIONS

- Shipbuilding
- Railway Industry
- Automotive
- Storage tanks

CLASSIFICATION

AWS A5.10 ER5356
EN ISO 18273-A S Al 5356 (AlMg5Cr(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min (for Argon)

APPROVALS

| ABS | LR | BV | RINA | TÜV | DB | CE |
|-----|----|----|------|-----|----|----|
| + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Be |
|------|------|------|------|------|------|------|-------|------|--------|
| bal. | 0.05 | 0.09 | 0.03 | 0.12 | 4.90 | 0.08 | <0.01 | 0.15 | 0.0002 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 110-120 | 240-296 | 17-26 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.2 | SPOOL | 7.0 | ED703770 |
| 1.6 | SPOOL | 7.0 | ED703804 |

SuperGlaze® MIG 5556A

TOP FEATURES

- High Magnesium alloyed wire
- The elements are controlled to obtain increased weld strength over the 5356 alloy
- Good ductility and improved crack resistance
- High Corrosion resistance for Marine applications

TYPICAL APPLICATIONS

- Marine
- Aircraft
- Military Industry

CLASSIFICATION

AWS A5.10 ER5556A
EN ISO 18273-A S Al 5556A (AlMg5Mn)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Mn | Mg | Cr | Ti | Be |
|------|------|------|-----|-----|------|------|--------|
| bal. | 0.05 | 0.11 | 0.6 | 5.1 | 0.08 | 0.09 | 0.0002 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 125-140 | 275-300 | 15-17 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | SPOOL | 7.3 | ED702986 |

SuperGlaze® MIG 5754

TOP FEATURES

- Magnesium alloyed aluminium for welding of alloys with a maximum of 3.5%
- Good corrosion resistance and excellent colour match after anodizing
- Suitable for a wide range of applications in general construction and structural industry

TYPICAL APPLICATIONS

- General Construction
- Structural Industry

CLASSIFICATION

AWS A5.10 ER5754
EN ISO 18273-A S Al 5754 (AlMg3)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| Al | Si | Fe | Cu | Mn | Mg | Cr | Ti | Be |
|------|------|------|------|------|-----|------|------|--------|
| bal. | 0.07 | 0.13 | 0.01 | 0.29 | 3.0 | 0.06 | 0.05 | 0.0004 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Typical values | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| | I1 | AW | 70-80 | 180-200 | 15-20 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.0 | SPOOL | 7.0 | ED701766 |
| 1.2 | SPOOL | 7.0 | ED701767 |

LNM 420FM

TOP FEATURES

- High resistance against corrosion, abrasion and impact deformation. Hardness approximately 55-60HRc
- Weld deposits can be used at service temperatures <450°C with a minimal loss of abrasion resistance. The as deposited weld metal can be shaped or profiled by grinding.
- Ferritic and martensitic structure

TYPICAL APPLICATIONS

- Hardfacing
- Repair
- Earthmoving

CLASSIFICATION

EN ISO 14700-A S Fe8

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

CE
+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Cr | Si |
|-----|-----|-----|-----|
| 0.5 | 0.4 | 9.0 | 3.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Typical values | Hardness (HRc) |
|----------------|----------------|
| | aprox. 60 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.0 | SPOOL (B300) | 15.0 | 604047 |
| 1.2 | SPOOL (B300) | 15.0 | 604054 |

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GTAW
CONSUMABLES
TIG RODS

LNT 24

TOP FEATURES

- Stable Arc
- Smooth bead appearance

TYPICAL APPLICATIONS

- Galvanized Steels
- General Construction

CLASSIFICATION

AWS A5.18 ER70S-2

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Ti | Zr | Al |
|------|------|-----|------|------|------|
| 0.05 | 1.20 | 0.5 | 0.10 | 0.05 | 0.08 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | -20 °C | -30 °C |
| Typical values | I1 | 550 | 620 | 23 | ≥ 47J | ≥ 27J |

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.4 | PE Tube | 5.0 | 580210 |

LNT 25

TOP FEATURES

- Excellent mechanical and toughness properties for low temperature applications, down to -40°C.
- Stable Arc
- Good feedability

TYPICAL APPLICATIONS

- General fabrication
- Thermal Power

CLASSIFICATION

AWS A5.18 ER70S-3
EN ISO 636-A W 42 5 2Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si |
|------|-----|-----|
| 0.08 | 1.1 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -20°C | -50°C |
| Typical values | I1 | AW | 450 | 560 | 26 | 170 | 100 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|--------------|
| 1.6 | PE Tube | 5.0 | T16T005R1S00 |
| 2.0 | PE Tube | 5.0 | T20T005R1S00 |
| 2.4 | PE Tube | 5.0 | T24T005R1S00 |
| 3.0 | PE Tube | 5.0 | T30T005R1S00 |
| 3.2 | PE Tube | 5.0 | T32T005R1S00 |

TIG

LNT 26

TOP FEATURES

- Excellent mechanical and toughness properties for low temperature applications, down to -50°C.
- Smooth bead appearance

TYPICAL APPLICATIONS

- General Constructions

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 636-A W 42 5 3Si1

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si |
|-----|-----|-----|
| 0.1 | 1.5 | 0.9 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|
| | | | | | | -20°C | -30°C | -50°C |
| Typical values | I1 | AW | 460 | 580 | 26 | 170 | 170 | 120 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|--------------|
| 1.6 | PE Tube | 5.0 | T16T005R6S00 |
| 2.0 | PE Tube | 5.0 | T20T005R6S00 |
| 2.4 | PE Tube | 5.0 | T24T005R6S00 |
| 3.2 | PE Tube | 5.0 | T32T005R6S00 |

LNT 27

TOP FEATURES

- Excellent mechanical and toughness properties for low temperature applications, down to -50°C.
- Smooth bead appearance

TYPICAL APPLICATIONS

- General Constructions

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 636-A W 46 5 4Si1

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si |
|-----|-----|-----|
| 0.1 | 1.5 | 0.9 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|
| | | | | | | -20°C | -30°C | -50°C |
| Typical values | I1 | AW | 460 | 580 | 26 | 170 | 170 | 120 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|--------------|
| 1.6 | PE Tube | 5.0 | T16T005R3S00 |
| 2.0 | PE Tube | 5.0 | T20T005R3S00 |
| 2.4 | PE Tube | 5.0 | T24T005R3S00 |
| 3.2 | PE Tube | 5.0 | T32T005R3S00 |

TIG

LNT 12

TOP FEATURES

- Used for welding low alloy creep resistant ferritic steels and fine grained steels
- Ideal for low temperature applications in the as welded condition with service temperatures in range -20°C to +500°C

TYPICAL APPLICATIONS

- Chemical
- Petrochemical
- Oil & Gas
- Thermal Power

CLASSIFICATION

AWS A5.28 ER70S-A1
 EN ISO 636-A W 46 3 2Mo
 EN ISO 21952-A W MoSi

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| DNV | TÜV | DB | CE |
|-----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Mo |
|-----|-----|-----|-----|
| 0.1 | 1.2 | 0.6 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | +20°C | -20°C |
| Typical values | I1 | AW | 635 | 670 | 22 | 170 | 110 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.6 | PE Tube | 5.0 | 604245 |
| 2.0 | PE Tube | 5.0 | 604269 |
| 2.4 | PE Tube | 5.0 | 604283 |
| 3.0 | PE Tube | 5.0 | 604306 |

LNT 19

TOP FEATURES

- Excellent mechanical characteristics.
- Also suitable where some resistance to hydrogen attack by sulphur bearing crude oil is required

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Pressure vessels
- Chemical
- Boilers, plates, tubes steels

CLASSIFICATION

AWS A5.28 ER80S-G*
 EN ISO 21952-A W CrMo1Si
 * Nearest classification ER80S-B2

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Mo |
|-----|-----|-----|-----|-----|
| 0.1 | 1.0 | 0.6 | 1.2 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|---------------|----------------------|------------------------|----------------|------------------------|
| Typical values | I1 | PWHT 700°C/1h | 540 | 640 | 22 | 250 |

* PWHT = Post Weld Heat Treatment

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.0 | PE Tube | 5.0 | 604344 |
| 2.4 | PE Tube | 5.0 | 604368 |
| 3.0 | PE Tube | 5.0 | 604382 |

LNT 20

TOP FEATURES

- Deposit insensitive to cracking.
- Also suitable for the welding of 1½Cr½Mo steels where improved resistance to hydrogen attack or corrosion by sulphur is required.

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Pressure vessels
- Chemical
- Boilers, plates, tubes steels

CLASSIFICATION

AWS A5.28 ER90S-G*
EN ISO 21952-A W CrMo2Si

* Nearest classification ER90S-B3

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Mo |
|------|-----|-----|-----|-----|
| 0.08 | 1.0 | 0.6 | 2.5 | 1.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|---------------|----------------------|------------------------|----------------|------------------------|
| Typical values | I1 | PWHT 700°C/1h | 560 | 640 | 22 | 140 |

* PWHT = Post Weld Heat Treatment

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.0 | PE Tube | 5.0 | 600247 |
| 2.4 | PE Tube | 5.0 | 605563 |

LNT 28

TOP FEATURES

- The addition of Ni and Cu to the weld metal provides increased resistance to atmospheric corrosion compared to conventional C-Mn steels
- Copper percentage help preventing further oxidation of the weld bead
- Excellent mechanical characteristics and resistance to corrosion.

TYPICAL APPLICATIONS

- Infrastructures
- Weather Resisting Steels

CLASSIFICATION

AWS A5.28 ER80S-G

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Ni | Cu |
|-----|-----|------|-----|-----|
| 0.1 | 1.4 | 0.75 | 0.8 | 0.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -20°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | I1 | AW | 570 | 620 | 26 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.4 | PE Tube | 5.0 | 606324 |

TIG

LNT Ni1

TOP FEATURES

- The weld metal contains less than 1% Ni conforming to NACE requirements
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- Cryogenic Applications
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.28 ER80S-Ni 1
EN ISO 636-A W 42 6 3Ni1

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Ni |
|-----|-----|-----|-----|
| 0.1 | 1.2 | 0.6 | 0.9 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -60°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | I1 | AW | 480 | 580 | 30 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.6 | PE Tube | 5.0 | 600162 |
| 2.0 | PE Tube | 5.0 | 605112 |
| 2.4 | PE Tube | 5.0 | 605136 |
| 3.0 | PE Tube | 5.0 | 605235 |

LNT Ni2.5

TOP FEATURES

- Excellent mechanical characteristic both when welded and after stress relieving.
- High impact value at low temperature (-60°C as welded and -90°C after stress relieving 15h/580°C)
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- Cryogenic Applications
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.28 ER80S-Ni2
EN ISO 636-A W 46 6 2Ni2

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Ni |
|-----|-----|------|-----|
| 0.1 | 1.1 | 0.55 | 2.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | -62°C | -90°C |
| Typical values | I1 | AW | 525 | 605 | 28 | 280 | 133 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.4 | PE Tube | 5.0 | 600223 |
| 3.0 | PE Tube | 5.0 | 605211 |

TIG

LNT 304L

TOP FEATURES

- The low carbon content reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The weld metal provides good corrosion resistance properties to intergranular attack from a range of liquid media at service temperatures up to 300°C.
- Excellent mechanical strength and corrosion resistance.

TYPICAL APPLICATIONS

- Pipework
- Petrochemical
- Nuclear Power generation

CLASSIFICATION

AWS A5.9 ER308L
EN ISO 14343-A W 19 9 L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|----|----|-----|
| 0.01 | 1.7 | 0.4 | 20 | 10 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20°C | -196°C |
| Typical values | I1 | AW | 472 | 692 | 34 | 120 | 91 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.2 | PE Tube | 5.0 | 595460 |
| 1.6 | PE Tube | 5.0 | 595468 |
| 2.0 | PE Tube | 5.0 | 595470 |
| 2.4 | PE Tube | 5.0 | 595475 |
| 3.2 | PE Tube | 5.0 | 595482 |

LNT 304LSi

TOP FEATURES

- The low carbon content reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.
- Better weldability and appearance

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER308LSi
EN ISO 14343-A W 19 9 LSi

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| DNV | TÜV | DB | CE |
|-----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|----|----|-----|
| 0.02 | 2.0 | 0.8 | 20 | 10 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|---------|
| | | | | | | +20 °C | -196 °C |
| Typical values | I1 | AW | 467 | 622 | 37 | 147 | 67 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.0 | PE Tube | 5.0 | 580174 |
| 1.2 | PE Tube | 5.0 | 580198 |
| 1.6 | PE Tube | 5.0 | 582512 |
| 2.0 | PE Tube | 5.0 | 582796 |
| 2.4 | PE Tube | 5.0 | 582802 |
| 3.2 | PE Tube | 5.0 | 583045 |

LNT 316L

TOP FEATURES

- The weld metal has a high resistance to crevice corrosion by oxidising acids.
- Excellent mechanical and chemical characteristics.
- Suitable for welding or hard-facing stainless steels with the same chemical composition

TYPICAL APPLICATIONS

- Pipework
- Petrochemical
- Nuclear Power generation

CLASSIFICATION

AWS A5.9 ER316L
EN ISO 14343-A W 19 12 3 L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|------|----|-----|
| 0.01 | 1.5 | 0.5 | 18.5 | 12 | 2.7 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|---------|---------|
| | | | | | | +20 °C | -120 °C | -196 °C |
| Typical values | I1 | AW | 400 | 620 | 35 | 100 | 80 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.2 | PE Tube | 5.0 | 601020 |
| 1.6 | PE Tube | 5.0 | 582239 |
| 2.0 | PE Tube | 5.0 | 600807 |
| 2.4 | PE Tube | 5.0 | 582499 |
| 3.2 | PE Tube | 5.0 | 582437 |

LNT 316LSi

TOP FEATURES

- The higher Si level results in a smooth weld bead shape and even appearance with excellent toe blending particularly in fillet welds.
- The weld metal has a high resistance to pitting and crevice corrosion by non-oxidising acids.
- Used for applications with service temperatures <400°C.

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER316LSi
EN ISO 14343-A W 19 12 3 LSi

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| DNV | TÜV | DB | CE |
|-----|-----|----|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.03 | 1.9 | 0.8 | 18.5 | 12.0 | 2.7 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20°C | -196°C |
| Typical values | I1 | AW | 484 | 624 | 32 | 100 | 82 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.0 | PE Tube | 5.0 | 580259 |
| 1.2 | PE Tube | 5.0 | 580235 |
| 1.6 | PE Tube | 5.0 | 583915 |
| 2.0 | PE Tube | 5.0 | 583922 |
| 2.4 | PE Tube | 5.0 | 582819 |
| 3.2 | PE Tube | 5.0 | 583571 |

LNT 309L

TOP FEATURES

- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- Also used for the welding of clad steels where service temperatures are below 300 °C.
- 300 °C maximum operating temperature.

TYPICAL APPLICATIONS

- Pipework
- Petrochemical
- Nuclear Power generation

CLASSIFICATION

AWS A5.9 ER309L
EN ISO 14343-A W 23 12 L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|------|------|-----|----|----|-----|
| 0.01 | 1.65 | 0.5 | 24 | 13 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|---------------------------|------------------------|----------------|
| Typical values | I1 | AW | 390 | 600 | 35 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.6 | PE Tube | 5.0 | 582240 |
| 2.0 | PE Tube | 5.0 | 582242 |
| 2.4 | PE Tube | 5.0 | 582245 |

LNT 309LSi

TOP FEATURES

- Also used for the welding of clad steels where service temperatures are below 300 °C.
- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.

TYPICAL APPLICATIONS

- General fabrication
- Cladding

CLASSIFICATION

AWS A5.9 ER309LSi
EN ISO 14343-A W 23 12 LSi

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| DNV | TÜV | CE |
|-----|-----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|------|-----|-----|------|----|-----|
| 0.02 | 2.0 | 0.8 | 23.5 | 13 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -120 °C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|--------------------------|
| Typical values | I1 | AW | 400 | 600 | 35 | 65 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.2 | PE Tube | 5.0 | 606008 |
| 1.6 | PE Tube | 5.0 | 604405 |
| 2.0 | PE Tube | 5.0 | 604566 |
| 2.4 | PE Tube | 5.0 | 604641 |
| 3.2 | PE Tube | 5.0 | 604665 |

LNT 347Si

TOP FEATURES

- The weld metal has a high resistance to corrosive media at service temperatures <400°C.
- The presence of niobium reduces the propensity of intergranular chromium carbide precipitation and thus reduces the susceptibility to intergranular corrosion.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.

TYPICAL APPLICATIONS

- Process Industries
- High Temperature Stainless Applications

CLASSIFICATION

AWS A5.9 ER347Si
EN ISO 14343-A W 19 9 Nb Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo | Nb |
|------|-----|-----|------|-----|------|-----|
| 0.05 | 1.4 | 0.7 | 19.5 | 9.5 | 0.01 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|---------------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20°C | -196°C |
| Typical values | I1 | AW | 400 | 650 | 35 | 80 | 45 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.6 | PE Tube | 5.0 | 600664 |
| 2.0 | PE Tube | 5.0 | 600671 |
| 2.4 | PE Tube | 5.0 | 600678 |

LNT 310

TOP FEATURES

- High temperature ductility and excellent resistance to oxidation at working temperatures <1000°C.
- The weld deposit is fully austenitic
- Excellent corrosion resistance even when hot.

TYPICAL APPLICATIONS

- Heat Exchangers
- Hot water boilers
- Fabrication of furnaces

CLASSIFICATION

AWS A5.9 ER310
EN ISO 14343-A W 25 20

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo |
|-----|-----|-----|----|----|-----|
| 0.1 | 1.7 | 0.5 | 26 | 21 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Typical values | I1 | AW | 360 | 600 | 35 | 100 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.6 | PE Tube | 5.0 | 604773 |
| 2.0 | PE Tube | 5.0 | 604790 |
| 2.4 | PE Tube | 5.0 | 604797 |

TIG

LNT 4455

TOP FEATURES

- TIG rod for welding fully austenitic CrNiMnMo stainless steels and low temperature steels
- Not susceptible for hot cracking

TYPICAL APPLICATIONS

- Non-magnetic applications
- Cryogenic Applications
- LNG

CLASSIFICATION

AWS A5.9 ER316Mn
EN ISO 14343-A W 20 16 3 MnL

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| C | Mn | Si | Cr | Ni | Mo | N |
|-------|-----|-----|----|----|-----|------|
| 0.015 | 7.0 | 0.4 | 20 | 16 | 3.0 | 0.15 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | 0.2% Proof strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -196°C |
|----------------|---------------|------------|---------------------------|------------------------|----------------|-------------------------|
| Typical values | I1 | AW | 430 | 650 | 35 | 75 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.0 | PE Tube | 5.0 | 600581 |

LNT CuSi3

TOP FEATURES

- This wire is frequently used for joining in artistic foundries, for welding galvanized sheets and even as a steel cladding.
- It is also suitable for surfaces subject to corrosion.

TYPICAL APPLICATIONS

- Cladding
- Brazing
- Automotive

CLASSIFICATION

AWS A5.7 ERCuSi-A
EN ISO 24373-A S Cu 6560 (CuSi3Mn1)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| Cu | Sn | Mn | Si | Zn |
|------|-----|-----|-----|-----|
| bal. | 0.1 | 1.0 | 3.0 | 0.1 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Hardness (HB) | Impact ISO-V (J) +20 °C |
|----------------|---------------|------------|----------------------|------------------------|----------------|---------------|-------------------------|
| Typical values | I1 | AW | 120 | 350 | 40 | 95 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 1.6 | PE Tube | 2.5 | 604694 |
| 2.0 | PE Tube | 2.5 | 604698 |
| 2.4 | PE Tube | 2.5 | 604721 |

TIG

LNT CuSn6

TOP FEATURES

- Good electrical conductivity
- Excellent corrosion resistance

TYPICAL APPLICATIONS

- Copper Tin Alloys

CLASSIFICATION

AWS A5.7 ERCuSn-A
EN ISO 24373-A S Cu 5180 (CuSn6P)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| Cu | Sn | P |
|------|-----|-----|
| bal. | 6.0 | 0.2 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Hardness (HB) | Impact ISO-V (J) +20°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|---------------|------------------------|
| Typical values | I1 | AW | 150 | 260 | 20 | 75 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|-----------|-------------|-------------|
| 2.0 | PE Tube | 2.5 | 605022 |
| 2.4 | PE Tube | 2.5 | 605039 |

SuperGlaze® TIG 4043

TOP FEATURES

- Use on many weldable cast and wrought aluminium alloys
- Generally recommended for welding 5052, any 6XXX series alloys and castings
- Alloy embossed on each rod for easy identification

TYPICAL APPLICATIONS

- Bicycle frames
- Pressure vessels

CLASSIFICATION

AWS A5.10 R4043
EN ISO 18273-A S Al 4043A (AlSi5)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| Al | Si | Fe | Cu | Mn | Mg | Zn | Ti | Be |
|------|------|------|-------|-------|------|-------|-------|--------|
| bal. | 5.01 | 0.13 | 0.008 | 0.009 | 0.03 | 0.002 | 0.007 | 0.0002 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 20-40 | 120-165 | 3-18 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|------------|-------------|--------------------|
| 1.6 | CARTON BOX | 4.5 | ED031111 |
| | CARTON BOX | 5.0 | ED701957 |
| 2.0 | CARTON BOX | 5.0 | ED702537 |
| 2.4 | CARTON BOX | 5.0 | ED701958 |
| 3.2 | CARTON BOX | 5.0 | ED701959, ED703877 |

SuperGlaze® TIG 5183

TOP FEATURES

- Designed for applications where higher strength is required
- For 5083 and 5456 base materials
- Excellent corrosion resistance ideal for Ship building and marine applications

TYPICAL APPLICATIONS

- Marine
- Shipbuilding
- Cryogenic tanks
- Bicycle frames
- Railway Industry

CLASSIFICATION

| | |
|----------------|-----------------------------|
| AWS A5.10 | R5183 |
| EN ISO 18273-A | S Al 5183 (AlMg4.5Mn0.7(A)) |

SHIELDING GASES (ACC. EN ISO 14175)

| | |
|-----------|--------------------------|
| I1 | Inert gas Ar (100%) |
| I3 | Inert gas Ar+ 0.5-95% He |
| Flow rate | 14.2-23.6 l/min |

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| Al | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Be |
|------|------|------|-------|------|------|------|------|------|--------|
| bal. | 0.03 | 0.13 | 0.001 | 0.65 | 4.99 | 0.10 | 0.02 | 0.07 | 0.0002 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 125-165 | 270-290 | 16-25 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|------------|-------------|--------------------|
| 1.6 | CARTON BOX | 5.0 | ED701963 |
| 2.0 | CARTON BOX | 5.0 | ED702566 |
| 2.4 | CARTON BOX | 4.5 | ED034193 |
| | CARTON BOX | 5.0 | ED701965 |
| 3.2 | CARTON BOX | 5.0 | ED701964, ED703829 |
| 4.0 | CARTON BOX | 5.0 | ED702517, ED703866 |

SuperGlaze® TIG 5356

TOP FEATURES

- Aluminium-magnesium alloy for use on many weldable cast and wrought aluminium alloys
- Excellent for color matching after anodizing
- Alloy embossed on each rod for easy identification
- General purpose filler alloy for 5XXX and 6XXX series alloys
- High strength filler metal

TYPICAL APPLICATIONS

- Architectural structures
- Armoured vehicles
- Gun mount bases

CLASSIFICATION

AWS A5.10 R5356
EN ISO 18273-A S Al 5356 (AlMg5Cr(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| TÜV | DB | CE |
|-----|----|----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| Al | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Be |
|------|------|------|------|------|------|------|-------|------|--------|
| bal. | 0.06 | 0.09 | 0.02 | 0.12 | 4.84 | 0.12 | 0.001 | 0.09 | 0.0002 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 110-120 | 240-296 | 17-26 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|------------|-------------|-------------|
| 1.6 | CARTON BOX | 4.5 | ED031108 |
| | CARTON BOX | 5.0 | ED701966 |
| 2.0 | CARTON BOX | 5.0 | ED702518 |
| 2.4 | CARTON BOX | 5.0 | ED702387 |
| 3.2 | CARTON BOX | 4.5 | ED031110 |
| | CARTON BOX | 5.0 | ED701967 |

SuperGlaze® TIG 5754

TOP FEATURES

- Magnesium alloyed aluminium for welding of alloys with a maximum of 3.5% Mg
- Good corrosion resistance and excellent colour match after anodizing
- Suitable for a wide range of applications in general construction and structural industry

TYPICAL APPLICATIONS

- General Construction
- Structural Industry

CLASSIFICATION

AWS A5.10 R5754
EN ISO 18273-A S Al 5754 (AlMg3)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He
Flow rate 14.2-23.6 l/min

APPROVALS

| | |
|-----|----|
| TÜV | CE |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL

| Al | Si | Fe | Cu | Mn | Mg | Cr | Ti | Be |
|------|------|------|------|------|-----|------|------|--------|
| bal. | 0.07 | 0.13 | 0.01 | 0.29 | 3.0 | 0.06 | 0.05 | 0.0004 |

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | I1 | AW | 70-80 | 180-200 | 15-20 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Diameter x Length (mm) | Packaging | Weight (kg) | Item number |
|------------------------|------------|-------------|-------------|
| 1.6 | CARTON BOX | 5.0 | ED703743 |

FLUX-CORED WIRES

GAS-SHIELDED, MILD STEEL

| | |
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GAS-SHIELDED, LOW ALLOY STEEL

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METAL-CORED GAS-SHIELDED, MILD STEEL

| | |
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METAL-CORED GAS-SHIELDED, LOW ALLOY STEEL

| | |
|------------------------------|-----|
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| Outershield® MC555CT-H..... | 209 |
| Outershield® MC715Ni1-H..... | 210 |
| Outershield® MC80D2-H..... | 211 |

GAS-SHIELDED, STAINLESS STEEL

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GAS-SHIELDED, HARDFACING

| | |
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SELF-SHIELDED, MILD STEEL

| | |
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SELF-SHIELDED, LOW ALLOY STEEL

| | |
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SELF-SHIELDED, HARDFACING

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FCAW-G
& FCAW-S
CONSUMABLES
FLUX-CORED
WIRES

Outershield® 71E-H

TOP FEATURES

- Rutile flux cored wire for high quality welding with M21 gas
- Excellent operator appeal due to superior welding characteristics
- Superior product consistency with optimal alloy control
- H4 class in 1.6mm diameter
- Full out-of-position capability with high deposition rates
- ABS, DNV-GL, LRS, BV, CWB, RINA, TUV, DB, RMRS approved

TYPICAL APPLICATIONS

- Shipbuilding
- Steel construction
- HYPERFILL

CLASSIFICATION

AWS A5.20 E71T-1M-J
 E71T-1C-H4
 EN ISO 17632-A T 46 3 P M 1 H5
 T 42 0 P C 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

APPROVALS

| ABS | LR | BV | DNV | RINA | RMRS |
|-----|----|----|-----|------|------|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|-----|-----|-------|-------|------------|
| M21 | 0.04 | 1.4 | 0.6 | 0.013 | 0.010 | 3 ml/100 g |
| C1 | 0.05 | 1.3 | 0.6 | 0.015 | 0.010 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|---------|---------|
| | | | | | | 0 °C | -20 °C | -30 °C | -40 °C |
| Required: AWS A5.20 | | | min. 400 | min. 480 | min. 22 | | | | min. 27 |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | | min. 47 | |
| Typical values | M21 | AW | 570 | 620 | 25 | | 90 | 65 | 40 |
| | C1 | AW | 520 | 575 | 24 | 80 | | | |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------------|
| 1.2 | SPOOL (S200) | 5.0 | 900125 |
| | SPOOL (B300) | 16.0 | 900118N, 900156N |
| | SPOOL (S300) | 16.0 | 900149N, 900149NE |
| | DRUM | 200.0 | 900297 |
| | SPOOL (S300) | 16.0 | 900262N, 900262NE |
| 1.6 | SPOOL (S300) | 16.0 | 900262N, 900262NE |

Outershield® 71M-H

TOP FEATURES

- Specially developed for welding with 100% CO₂ and optimised for Ar/CO₂ mix gas; smooth arc with low spatter
- Good mechanical properties (CVN > 47) at -30°C for CO₂)
- Perfect root pass welding on ceramic backing
- High current capacity, especially in positional welding
- Stable mechanical properties over the wider range of heat input

TYPICAL APPLICATIONS

- Shipbuilding
- Steel construction
- HYPERFILL

CLASSIFICATION

AWS A5.20 E71T-1/9C-H4 / E71T-1/9M-H4
EN ISO 17632-A T 46 3 P C 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
C1 Active gas 100% CO₂
Gas flow 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|------|-----|-------|-------|------------|
| C1 | 0.05 | 1,3 | 0.4 | 0.015 | 0.009 | 3 ml/100 g |
| M21 | 0.05 | 1,47 | 0.5 | 0.015 | 0.009 | 4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -20°C | -30°C |
| Required: AWS A5.20 | | | min. 400 | min. 480 | min. 22 | | |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | min. 47 |
| Typical values | M21 | AW | 595 | 650 | 26 | 80 | |
| | C1 | AW | 530 | 590 | 25 | | 70 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------------|
| 1.0 | SPOOL (S200) | 5.0 | 900770N |
| | SPOOL (S200) | 5.0 | 900707 |
| | SPOOL (B300) | 16.0 | 900700N, 900728N |
| 1.2 | SPOOL (S300) | 16.0 | 900728NE |
| | DRUM | 200.0 | 900798 |
| | SPOOL (B300) | 16.0 | 900735N |
| 1.6 | SPOOL (S300) | 16.0 | 900742N, 900742NE |

Outershield® 71MS-H

TOP FEATURES

- Excellent operator appeal due to superior welding characteristics.
- Perfect root pass welding on ceramic backing.
- Outstanding mechanical properties (CVN > 47) at -40°C).

TYPICAL APPLICATIONS

- Shipbuilding
- Steel construction

CLASSIFICATION

EN ISO 17632-A T 46 4 P C 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
Flow rate 15-25 l/min

APPROVALS

| ABS | DNV |
|-----|-----|
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Ni | Si | P | S | HDM |
|---------------|------|------|-----|-----|-------|-------|------------|
| C1 | 0.05 | 1.35 | 0.4 | 0.4 | 0.015 | 0.010 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.20 | | | min. 400 | min. 480 | min. 22 | |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | min. 47 |
| Typical values | C1 | AW | 540 | 610 | 25 | 75 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 5.0 | 900507 |
| | SPOOL (B300) | 16.0 | 900500N |
| | SPOOL (S300) | 16.0 | 900528N |
| 1.6 | SPOOL (S300) | 16.0 | 900542N |

FCAW

Outershield® 71T1

TOP FEATURES

- Rutile gas shielded flux cored wire designed and qualified for CO₂ shielding gas. Good operator appeal due to welding characteristics slag system
- Stable behavior in root passing on ceramic backing
- CVN > 47J at -20°C
- Suitable for primed plates

TYPICAL APPLICATIONS

- Shipbuilding
- Steel construction

CLASSIFICATION

AWS E71T1-C-H8
EN ISO T 42 2 P C 2 H10

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
Gas flow 15-25l/min

APPROVALS

| Shielding gas | ABS | DNV | LRS | RINA |
|---------------|-----|-----|-----|------|
| C1 | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S |
|---------------|------|-----|-----|-------|-------|
| C1 | 0.05 | 1.1 | 0.3 | 0.015 | 0.010 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -20°C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.20 | | | min. 400 | 490-660 | min. 22 | min. 27 |
| EN ISO 17632-A | | | min. 420 | 500-640 | min. 20 | min. 47 |
| Typical values | C1 | AW | 550 | 580 | 25 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 5.0 | 900907 |
| | SPOOL (B300) | 16.0 | 900914N |
| 1.6 | SPOOL (S300) | 16.0 | 900942N |

Outershield® T55-H

TOP FEATURES

- All position gas shielded basic flux cored wire
- Good weldability, also vertical up (3G)
- Exceptional mechanical properties (CVN >47) at -50°C

TYPICAL APPLICATIONS

- Offshore
- Steel construction

CLASSIFICATION

AWS A5.20 E71T-5C-JH4
 E71T-5M-JH4
 EN ISO 17632-A T 42 4 B C 2 H5
 T 42 4 B M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

APPROVALS

| ABS | LR | BV | DNV | RINA | DB |
|-----|----|----|-----|------|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|-----|------|-------|-------|------------|
| C1 | 0.05 | 1.5 | 0.55 | 0.012 | 0.010 | 3 ml/100 g |
| M21 | 0.06 | 1.5 | 0.6 | 0.012 | 0.010 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------------|----------------------|------------------------|----------------|------------------|---------|-------|
| | | | | | | -20°C | -40°C | -50°C |
| Required: AWS A5.20 | | | min. 400 | min. 480 | min. 22 | | min. 27 | |
| EN ISO 17632-A | | | min. 420 | 500-640 | min. 20 | | min. 47 | |
| Typical values | M21 | AW | 480 | 570 | 27 | 130 | 85 | 60 |
| | | SR: 15h/580°C | 425 | 570 | 27 | | 80 | |

* AW = As welded; SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 4.5 | 942231 |
| | SPOOL (B300) | 16.0 | 941609N |
| 1.6 | SPOOL (B300) | 16.0 | 941549N |

FCAW

Outershield® 12-H

TOP FEATURES

- All position mix gas shielded 0.5% Mo-alloyed rutile cored wire
- Outstanding operator appeal
- Superior product consistency with optimal alloy control
- Excellent wire feeding

TYPICAL APPLICATIONS

- Power Generation
- Welding of 0.5% Mo alloyed creep resistant steel

CLASSIFICATION

AWS A5.29 E 81T1-A1M-H4
EN ISO 17634-A T MoL P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Mo | HDM |
|---------------|-------|-----|-----|-------|-------|------|------------|
| M21 | 0.065 | 0.8 | 0.2 | 0.014 | 0.010 | 0.46 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|--------------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | +20°C | -20°C |
| Required: AWS A5.29 | | SR = 620 ± 15°C/1h | min. 470 | 550-690 | min. 19 | not specified | |
| EN ISO 17634-A | | SR = 570-620°C/1h | min. 355 | min. 510 | min. 22 | min. 47 | |
| Typical values | M21 | SR = 1h/620°C | 540 | 600 | 27 | 160 | 79 |

* SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 943009N |

Outershield® 19-H

TOP FEATURES

- Superior weldability, low spatter, good bead appearance
- Outstanding operator appeal
- Superior product consistency with optimal alloy control
- Excellent wire feeding

TYPICAL APPLICATIONS

- Power Generation
- Welding of 1.25%Cr 0.55Mo creep resistant steels.

CLASSIFICATION

AWS A5.29 E 81T1-B2M-H4
 EN ISO 17634-A T CrMo1 P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Cr | Mo | HDM |
|---------------|------|------|------|-------|-------|------|------|------------|
| M21 | 0.07 | 0.74 | 0.24 | 0.013 | 0.010 | 1.24 | 0.52 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|--------------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | | +20°C | -20°C |
| Required: AWS A5.29 | | SR = 690 ± 15°C/1h | min. 470 | 550-690 | min. 19 | not specified | |
| EN ISO 17634-A | | SR = 660-700°C/1h | min. 355 | min. 510 | min. 22 | min. 47 | |
| Typical values | M21 | SR = 1h/690°C | 545 | 635 | 21 | 150 | 80 |

* SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 943016N |

FCAW

Outershield® 20-H

TOP FEATURES

- Superior weldability, low spatter, good bead appearance
- Outstanding operator appeal
- Superior product consistency with optimal alloy control
- Excellent wire feeding

TYPICAL APPLICATIONS

- Power Generation
- Welding of 2.25%Cr 1%Mo creep resistant steels.

CLASSIFICATION

AWS A5.29 E 91T1-B3M-H4
 EN ISO 17634-A T CrMo2 P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Cr | Mo | HDM |
|---------------|------|------|------|-------|-------|------|------|------------|
| M21 | 0.07 | 0.75 | 0.21 | 0.013 | 0.008 | 2.23 | 1.09 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|-----------------------|---------------|---------------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20 °C | -20 °C |
| Required: ISO 17634-A | | SR = 690 ± 15 °C/1h | min. 540 | 620-760 | min. 17 | not specified | |
| EN ISO 17634-A | | SR = 690-750 °C/1h | min. 400 | min. 500 | min. 18 | min. 47 | |
| Typical values | M21 | SR = 1h/690 °C | 570 | 680 | 19 | 150 | 60 |

* SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 16.0 | 943025N |

FCAW

Outershield® 500CT-H

TOP FEATURES

- For welding in all positions, except vertical down
- Superior weldability, low spatter, good bead appearance
- Outstanding operator appeal

TYPICAL APPLICATIONS

- Welding of weather resistant steels
- Steel construction

CLASSIFICATION

AWS A5.29 E81T1-GM
 EN ISO 18276-A T 50 5 Z P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Cu | HDM |
|---------------|------|-----|-----|-------|-------|------|------|------------|
| M21 | 0.04 | 1.3 | 0.2 | 0.014 | 0.010 | 0.84 | 0.39 | 4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -50°C |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: | | | min. 470 | 550-690 | min. 19 | |
| EN ISO 18276-A | | | min. 500 | 560-720 | min. 18 | min. 47 |
| Typical values | M21 | AW | 580 | 610 | 23 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 942781N |

Outershield® 555CT-H

TOP FEATURES

- For welding in all positions, except vertical down
- Superior weldability, low spatter, good bead appearance
- Outstanding operator appeal
- Exceptional mechanical properties (CVN >47J at -50°C)

TYPICAL APPLICATIONS

- Welding of weather resistant steels
- Steel construction

CLASSIFICATION

AWS A5.29 E81T1-W2M-J
 EN ISO 17632-B T555T1-1MA-NCC1-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Cr | Cu | HDM |
|---------------|------|-----|-----|-------|-------|------|------|------|------------|
| M21 | 0.03 | 1.1 | 0.4 | 0.015 | 0.010 | 0.60 | 0.55 | 0.55 | 4 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -40°C | -50°C |
| Required: | | | min. 470 | 550-690 | min. 19 | min. 27 | |
| EN ISO 18276-B | | | min. 460 | 550-740 | min. 17 | | min. 47 |
| Typical values | M21 | AW | 600 | 660 | 20 | 140 | 100 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 942789N |

Outershield® 690-H

TOP FEATURES

- All position gas shielded rutile flux cored wire, for high strength steel grades like grade S690
- Outstanding operator appeal
- Excellent mechanical properties (CVN >50J) at -40°C

TYPICAL APPLICATIONS

- Steel construction
- Offshore
- Pipeline

CLASSIFICATION

AWS A5.29 E11T1-K3M-JH4
 EN ISO 18276-A T 69 4 Z P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Mo | HDM |
|---------------|------|-----|-----|-------|-------|-----|-----|------------|
| M21 | 0.06 | 1.5 | 0.2 | 0.015 | 0.010 | 2.0 | 0.3 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|-------|
| | | | | | | -30°C | -40°C | -46°C |
| Required: AWS A5.29 | | | min. 680 | 760-900 | min. 15 | min. 27 | | |
| EN ISO 18276-A | | | min. 690 | 770-940 | min. 17 | | min. 47 | |
| Typical values | M21 | AW | 780 | 810 | 18 | 85 | 80 | 65 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 4.5 | 942415 |
| | SPOOL (B300) | 16.0 | 942422N |
| | SPOOL (S300) | 16.0 | 942453EN |
| 1.6 | SPOOL (S300) | 16.0 | 942447N |

FCAW

Outershield® 690-HSR

TOP FEATURES

- All position gas shielded rutile flux cored wire, for high strength steel grades like grade S690
- Specific design for stress relieved applications, guaranteed impact properties after PWHT
- Excellent mechanical properties (CVN >50J) at -40 °C

TYPICAL APPLICATIONS

- PWHT applications
- Steel construction

CLASSIFICATION

AWS A5.29 E111T1-K3M-J
 EN ISO 18276-A T 69 4 Z P M 2 H5 T

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Mo | HDM |
|---------------|------|-----|-----|-------|-------|-----|-----|------------|
| M21 | 0.06 | 1.5 | 0.2 | 0.015 | 0.010 | 2.0 | 0.5 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------------------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -30 °C | -40 °C |
| Required: AWS A5.29 | | | min. 680 | 760-900 | min. 15 | min. 27 | |
| EN ISO 18276-A | | | min. 690 | 770-940 | min. 157 | | min. 47 |
| Typical values | M21 | AW | 740 | 790 | 17 | 9 | 70 |
| | | SR: 1h/580 °C, 3G up - V60 ° | 720 | 770 | 20 | | 60 |

* AW = As welded; SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 4.5 | 942818 |
| | SPOOL (B300) | 16.0 | 942804N |

FCAW

Outershield® 81K2-H

TOP FEATURES

- Rutile flux cored gas shielded 1.5% Ni, Ti and B alloyed flux cored wire with very good impact toughness down to -60°C.
- Best in class consumable for welding of wind mill foundations and applications in offshore oil and gas and structural segments. Superior weldability, low spatter, good bead appearance.
- Exceptional mechanical properties (CVN >80J at -60°C).
- Superior product consistency with optimal alloy control
- Can be applied for applications requiring CTOD testing.

TYPICAL APPLICATIONS

- Offshore
- Wind tower floating foundations
- Steel construction
- Pipeline
- HYPERFILL

CLASSIFICATION

AWS A5.29 E81T1-K2M-J
 EN ISO 17632-A T 50 6 1.5Ni P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

APPROVALS

| LR | DNV | RINA |
|----|-----|------|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | HDM |
|---------------|------|-----|-----|-------|-------|-----|------------|
| M21 | 0.04 | 1.4 | 0.2 | 0.012 | 0.010 | 1.4 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|---------|
| | | | | | | -40°C | -50°C | -60°C |
| Required: AWS A5.29 | | | min. 470 | 550-690 | min. 19 | min. 27 | | |
| EN ISO 17632-A | | | min. 500 | 560-720 | min. 18 | | | min. 47 |
| Typical values | M21 | AW | 590 | 630 | 23 | 130 | 100 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|------------------|
| 1.2 | SPOOL (B300) | 16.0 | 941395N |
| | SPOOL (S300) | 16.0 | 941272N, 941494N |

FCAW

Outershield® 81K2-HSR

TOP FEATURES

- Specific design for stress relieved applications, guaranteed impact properties after PWHT
- Superior weldability, low spatter, good bead appearance and outstanding operators appeal
- Exceptional mechanical properties (CVN >80J at -60°C)
- Superior product consistency with optimal alloy control

TYPICAL APPLICATIONS

- Applications requiring PWHT
- Steel construction

CLASSIFICATION

AWS A5.29 E81T1-K2M-J
 EN ISO 17632-A T 50 6 1.5Ni P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | HDM |
|---------------|------|-----|-----|-------|-------|-----|------------|
| M21 | 0.06 | 1.3 | 0.3 | 0.012 | 0.010 | 1.4 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|----------------------------|----------------------|------------------------|----------------|------------------|-------|---------|
| | | | | | | -40°C | -50°C | -60°C |
| Required: AWS A5.29 | | | min. 470 | 550-690 | min. 19 | min. 27 | | |
| EN ISO 17632-A | | | min. 500 | 560-720 | min. 18 | | | min. 47 |
| Typical values | M21 | AW | 590 | 630 | 23 | 140 | 100 | 80 |
| | | SR: 1h/600°C, 3G up - V45° | 570 | 620 | 23 | | | 85 |

* AW = As welded; SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 943207N |

Outershield® 81Ni1-H

TOP FEATURES

- Best in class rutile flux cored wire for positional welding with very good impact toughness at -50 °C.
- Outstanding operator appeal. Optimal solution for welding of wind mill foundations, oil and gas industry and structural applications.
- Superior product consistency with optimal alloy control.
- Can be applied for applications requiring CTOD testing.
- Meets NACE MR-0175 requirements.

TYPICAL APPLICATIONS

- Offshore
- Wind tower floating foundations
- Steel construction
- Pipeline
- HYPERFILL

CLASSIFICATION

AWS A5.29 E81T1-Ni1M-J
 EN ISO 17632-A T 50 5 1Ni P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

APPROVALS

| LR | BV | DNV | RINA | RMRS | CWB |
|----|----|-----|------|------|-----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | HDM |
|---------------|------|-----|-----|-------|-------|------|------------|
| M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 0.95 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -40 °C | -50 °C |
| Required: AWS A5.29 | | | min. 470 | 550-690 | min. 19 | min. 27 | |
| EN ISO 17632-A | | | min. 500 | 560-720 | min. 18 | | min. 47 |
| Typical values | M21 | AW | 530 | 600 | 24 | 90 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|------------------|
| 1.2 | SPOOL (S200) | 4.5 | 942316 |
| | SPOOL (B300) | 16.0 | 941357N, 941359N |
| | SPOOL (S300) | 16.0 | 941378N |
| 2.0 | SPOOL (S300) | 16.0 | 941381N |

FCAW

Outershield® 81Ni1-HSR

TOP FEATURES

- Specific design for stress relieved applications, guaranteed impact properties after PWHT
- Superior weldability, low spatter, good bead appearance
- Outstanding operator appeal. Optimal solution for wind mill foundations, oil and gas segment, structural and pipeline applications.
- Exceptional mechanical properties (CVN >47) at -50°C)
- Meets NACE MR-0175 requirements

TYPICAL APPLICATIONS

- Applications requiring PWHT
- Steel construction
- Pipeline

CLASSIFICATION

AWS A5.29 E81T1-Ni1M-J
 EN ISO 17632-A T 55 4 1NiMo P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

APPROVALS

| LR | BV | DNV | TÜV | DB |
|----|----|-----|-----|----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | HDM |
|---------------|------|-----|-----|-------|-------|------|------------|
| M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 0.95 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|-------------------------------------|----------------------|------------------------|----------------|------------------|----------|
| | | | | | | -40°C | -50°C |
| Required: AWS A5.29 | | | min. 470 | 550-690 | min. 19 | min. 27 | |
| EN ISO 17632-A | | | min. 500 | 560-720 | min. 18 | | min. 47 |
| Typical values | M21 | AW SR: 1h/600°C, 3G up - V45° | 530 525 | 600 590 | 24 25 | 90 | 60 70 |

* AW = As welded; SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 942699N |
| | SPOOL (S300) | 16.0 | 942719N |
| 1.6 | SPOOL (S300) | 16.0 | 942767N |

Outershield® 91K2-HSR

TOP FEATURES

- Outershield 91K2-HSR is low alloyed rutile flux cored wire and provides significant value for industry segments such as nuclear, pipelines and pressure vessels. Specific design for stress relieved applications, guaranteed impact properties after PWHT.
- Superior weldability, low spatter, good bead appearance and outstanding operators appeal
- Exceptional mechanical properties
- Superior product consistency with optimal alloy control
- Excellent wire feeding
- Specific design to withstand high heat input procedures

TYPICAL APPLICATIONS

- Welding of 550MPa steels
- PWHT applications
- Pipeline

CLASSIFICATION

AWS A5.29 E91T1-GM
 EN ISO 18276-A T 55 4 1NiMo P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Mo | HDM |
|---------------|------|-----|-----|-------|-------|-----|-----|------------|
| M21 | 0.05 | 1.4 | 0.2 | 0.013 | 0.010 | 1.4 | 0.4 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40 °C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|-------------------------|
| Required: AWS A5.29 | | | min. 540 | 620-760 | min. 17 | |
| EN ISO 18276-A | | | min. 550 | 642-820 | min. 18 | min. 47 |
| Typical values | M21 | AW | 640 | 700 | 19 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 5.0 | 943211 |
| | SPOOL (S300) | 15.0 | ED034116N |
| | SPOOL (B300) | 16.0 | 943212N |
| | SPOOL (S300) | 16.0 | 943210N |

FCAW

Outershield® 91Ni1-HSR

TOP FEATURES

- Outstanding mechanical properties and purity of weld metal.
- Good weldability, also in vertical up (3G)
- Exceptional mechanical properties (CVN >47) at -50°C)
- Superior product consistency with optimal alloy control

TYPICAL APPLICATIONS

- Welding of 550MPa steels
- PWHT applications
- Steel construction

CLASSIFICATION

AWS A5.29 E91T1-GM
 EN ISO 18276-A T 55 4 1NiMo P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Mo | HDM |
|---------------|------|-----|-----|-------|-------|------|-----|------------|
| M21 | 0,05 | 1,4 | 0,2 | 0,013 | 0,010 | 0,95 | 0,4 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.29 | | | min. 540 | 620-760 | min. 17 | |
| EN ISO 18276-A | | | min. 550 | 640-820 | min. 18 | min. 47 |
| Typical values | M21 | AW | 640 | 700 | 19 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 16.0 | 942673N |

Outershield® 101Ni1-HSR

TOP FEATURES

- Rutile micro alloyed flux-cored wire for welding in all positions, special of high carbon containing low alloy high strength steels such as SAE 4130
- Specific design for stress relieved applications. Outstanding operator appeal.
- Excellent mechanical properties (CVN >50J at -40°C).
- Superior product consistency with optimal alloy control. Good wire feeding.
- Meets NACE MR-0175 requirements.

TYPICAL APPLICATIONS

- Offshore
- Stress relief
- Pipeline

CLASSIFICATION

AWS A5.29 E101T1-G H4

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂
Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Mo |
|---------------|------|-----|-----|-------|-------|------|-----|
| M21 | 0.06 | 2.0 | 0.3 | 0.013 | 0.010 | 0.95 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -40°C | -50°C |
| Required: AWS A5.29 | | | min. 610 | 830 | min. 16 | | min. 27 |
| Typical values | M21 | AW | 750 | 810 | 17 | 60 | 40 |
| | | SR | 690 | 780 | 18 | | 50 |

* AW = As welded; SR = Stress relieved: 4h/645°C

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 15.0 | ED034210N |

FCAW

Pipelin[®] G60M-E

TOP FEATURES

- All positional rutile flux cored wire for mechanized and semi-automatic welding with increased deposition rate (kg/h)
- Easy to remove slag reduces cleaning time and improves operating factor
- Very low hydrogen (HDM <4 ml/100g) and long term resistance against moisture pick-up in vacuum sealed packaging
- Focused and clearly visible arc column offers easier welding and reduces operator training time
- Stable mechanical properties over a wide range of heat input, CVN > 47J at -40°C

TYPICAL APPLICATIONS

- Pipelines.

CLASSIFICATION

AWS E71T1/9-M-J
EN ISO T 46 4 P M1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Gas flow 15-25l/min

APPROVALS

| | |
|----------------------|----------|
| Shielding gas M21 | ABS + |
|----------------------|----------|

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Ni | P | S | HDM |
|---------------|------|------|------|------|-------|-------|------------|
| M21 | 0.04 | 1.35 | 0.25 | 0.45 | 0.013 | 0.008 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|---------|
| | | | | | | -20°C | -30°C | -40°C |
| Required: AWS A5.20 | | | min. 400 | min. 480 | min. 22 | | | |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | | min. 47 |
| Typical values | M21 | AW | 485 | 540 | 23 | 135 | 120 | 85 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 5.0 | 944225 |

Pipelinor® G70M-E

TOP FEATURES

- All positional rutile flux cored wire for mechanized and semi-automatic welding with increased deposition rate (kg/h)
- Designed for pipeline applications. Easy to remove slag reduces cleaning time and improves operating factor
- Concentrated and deeply penetrating arc helps to achieve optimal quality of welds
- Focused and clearly visible arc column offers easier welding and reduces operator training time
- Stable mechanical properties, CVN > 47J at -50°C
- Very low hydrogen (HDM <4 ml/100g) and long term resistance against moisture pick-up in vacuum sealed packaging

TYPICAL APPLICATIONS

- Pipelines.

CLASSIFICATION

AWS E81T1-GM-H4
 EN ISO T 50 5 Z P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Gas flow 15-25l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Ni | P | S | Mo |
|---------------|------|-----|-----|------|-------|-------|------|
| M21 | 0.06 | 1.5 | 0.2 | 0.95 | 0.013 | 0.010 | 0.15 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|-------|---------|
| | | | | | | -20°C | -40°C | -50°C |
| Required: AWS A5.29 | | | min. 470 | 550-690 | min. 19 | | | |
| EN ISO 17632-A | | | min. 500 | 560-720 | min. 18 | | | min. 47 |
| Typical values | M21 | AW | 580 | 630 | 23 | 100 | 90 | 70 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 4.5 | 944252 |
| | SPOOL (B300) | 16.0 | 944238N |

Pipelinor® G80M-E

TOP FEATURES

- Flux cored wire for mechanised and semi-automatic welding with increased deposition rate (kg/h).
- Perfect bead profile for fill and cap passes.
- Easy to remove, reduces cleaning time and improves operating factors.
- Focused and clearly visible arc column offers easier welding and reduces operator training time.
- A concentrated and deeply penetrating arc helps to achieve optimal quality of welds.
- Very low hydrogen (HDM <4 ml/100g) and long term resistance against moisture pick-up in vacuum sealed packaging.

TYPICAL APPLICATIONS

- Pipeline

CLASSIFICATION

AWS A5.29 E91T1-GM
 EN ISO 17632-A T 55 4 1NiMo P M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 Gas flow 15-25l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Ni | P | S | Mo |
|---------------|------|-----|-----|------|-------|-------|-----|
| M21 | 0.06 | 1.4 | 0.3 | 0.95 | 0.013 | 0.010 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.29 | | | min. 540 | 620-760 | min. 19 | |
| EN ISO 17632-A | | | min. 550 | 640-820 | min. 18 | min. 47 |
| Typical values | M21 | AW | 695 | 740 | 21 | 65 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 4.5 | 944253 |

FCAW

Outershield® MC700

TOP FEATURES

- Very few silicates, virtually no spatter, fast travel speed, excellent wire feeding
- Superior product consistency with optimal alloy control

TYPICAL APPLICATIONS

- Steel construction

CLASSIFICATION

AWS A5.18 E70C-6M H48
EN ISO 17632-A T 46 2 M M 2 H10

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|------|-----|-------|-------|------------|
| M21 | 0.05 | 1.35 | 0.6 | 0.015 | 0.023 | 5 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -20 °C | -30 °C |
| Required: AWS A5.18 | | | min. 400 | min. 480 | min. 22 | | min. 27 |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | min. 47 | |
| Typical values | M21 | AW | 475 | 560 | 24 | 75 | 45 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 900206N |

Outershield® MC-710-H

TOP FEATURES

- High efficiency Metal Cored Wire for welding with M21 gas
- Excellent arc characteristics provides outstanding operator appeal
- Regular welds with very little silicates
- Superior product consistency with optimal alloy control

TYPICAL APPLICATIONS

- Steel construction
- High quality welds
- Automotive and transportation
- HYPERFILL

CLASSIFICATION

AWS A5.18 E70C-6M H4
EN ISO 17632-A T 46 3 M M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

APPROVALS

| ABS | LR | BV | DNV | RINA | RMRS | TÜV | DB |
|-----|----|----|-----|------|------|-----|----|
| + | + | + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|------|-----|-------|-------|------------|
| M21 | 0.05 | 1.35 | 0.6 | 0.015 | 0.023 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------------|----------------------|------------------------|----------------|------------------|---------|--------|
| | | | | | | -20 °C | -30 °C | -40 °C |
| Required: AWS A5.18 | | | min. 400 | min. 480 | min. 22 | | | |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | min. 47 | |
| Typical values | M21 | AW | 495 | 570 | 26 | 90 | 60 | |
| | M21 | SR: 15h/580°C | 430 | 530 | 28 | | 105 | 75 |

* AW = As welded; SR = Stress relieved

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------------------|
| 1.2 | SPOOL (S200) | 5.0 | 900307 |
| | SPOOL (B300) | 16.0 | 900300N |
| | SPOOL (S300) | 16.0 | 900356N, 900356NE |
| | DRUM | 200.0 | 900398, 941922, 941922N |
| 1.4 | SPOOL (B300) | 16.0 | 900328N |
| | DRUM | 200.0 | 900391 |
| 1.6 | SPOOL (B300) | 16.0 | 900314N, 900370N |
| | SPOOL (S300) | 16.0 | 900370NE |
| | DRUM | 200.0 | 900384, 941924 |
| | REEL | 270.0 | 941692 |

Outershield® MC710RF-H

TOP FEATURES

- Very few silicates, virtually no spatter, fast travel speed, excellent wire feeding
- Superior on scaled plate, good resistance to porosity
- Very good mechanical properties (CVN >47J at -30°C)
- Superior product consistency with optimal alloy control
- Reduced welders' exposure to welding fumes.

TYPICAL APPLICATIONS

- Steel construction
- High quality welds
- Automotive and transportation

CLASSIFICATION

AWS A5.18 E70C-6M H4
EN ISO 17632-A T 46 3 M M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

APPROVALS

| ABS | LR | BV | DNV | TÜV | DB |
|-----|----|----|-----|-----|----|
| + | + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|------|-----|-------|-------|------------|
| M21 | 0.05 | 1.35 | 0.6 | 0.015 | 0.023 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -20°C | -30°C |
| Required: AWS A5.18 | | | min. 400 | min. 480 | min. 22 | | min. 27 |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | min. 47 |
| Typical values | M21 | AW | 495 | 570 | 26 | 90 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|----------------|
| 1.2 | SPOOL (S200) | 5.0 | 901307 |
| | SPOOL (B300) | 16.0 | 901300, 901301 |
| | DRUM | 200.0 | 901398 |
| 1.4 | SPOOL (B300) | 16.0 | 901328 |

Outershield® MC715-H

TOP FEATURES

- High deposition rate and excellent weldability. Low amount of silicates. Suitable for single and multipass automatic welding.
- Excellent arc characteristics give outstanding operator appeal.
- Excellent mechanical properties (CNV >47) at -40°C
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications. Bridging and root passing capabilities with short and pulsed arc.
- Applicable for welding of flanges of wind mill towers.

TYPICAL APPLICATIONS

- Steel construction
- Offshore
- Welding of wind tower flanges
- HYPERFILL

CLASSIFICATION

AWS A5.18 E70C-6M H4
EN ISO 17632-A T 46 4 M M2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

APPROVALS

| BV | DNV | RINA | DB |
|----|-----|------|----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S |
|---------------|------|-----|-----|-------|-------|
| M21 | 0.04 | 1.5 | 0.4 | 0.012 | 0.020 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -30°C | -40°C |
| Required: AWS A5.18 | | | min. 400 | min. 480 | min. 22 | | |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | min. 47 |
| Typical values | M21 | AW | 480 | 580 | 27 | 120 | 110 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------------|
| 1.2 | SPOOL (B300) | 16.0 | 900402N |
| | SPOOL (S300) | 16.0 | 900401N, 900429NE |
| | DRUM | 200.0 | 900492, 941930 |
| 1.4 | SPOOL (B300) | 16.0 | 900408N |
| | DRUM | 200.0 | 900491 |
| 1.6 | SPOOL (B300) | 16.0 | 900415N |
| | SPOOL (S300) | 16.0 | 900470N |
| | DRUM | 200.0 | 941932 |

Outershield® MC420N-H

TOP FEATURES

- High resistance to porosity
- Designed to withstand normalizing treatment (4h 900°C)
- Mechanical properties after normalizing meet base material requirements

TYPICAL APPLICATIONS

- Wind tower

CLASSIFICATION

AWS A5.28 E70C-GM H4
EN ISO 17632-A T 38 Z Z M M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Cr | Ni | HDM |
|---------------|------|-----|------|-------|-------|------|-----|------------|
| M21 | 0.03 | 0.6 | 0.45 | 0.017 | 0.023 | 0.03 | 2.9 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -50°C |
|----------------|---------------|--------------|----------------------|------------------------|----------------|------------------------|
| Typical values | M21 | N = 900°C/4h | 353 | 493 | 32 | 57 |

* N = Normalising

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.6 | SPOOL (S300) | 16.0 | 943327N |
| | DRUM | 200.0 | 943314 |
| 2.0 | DRUM | 200.0 | 943316 |

Outershield® MC555CT-H

TOP FEATURES

- Excellent mechanical properties (CVN >47) at -40°C
- Superior product consistency with optimal alloy control

TYPICAL APPLICATIONS

- Welding of weather resistant steels

CLASSIFICATION

AWS A5.28 E81T1-W2M-J
EN ISO 17632-B T554T15-OMA-NCC1-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Gas flow 15-25 l/min

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | Cr | Cu | HDM |
|---------------|------|-----|-----|-------|-------|------|------|------|------------|
| M21 | 0.03 | 1.3 | 0.4 | 0.015 | 0.020 | 0.55 | 0.55 | 0.55 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|-------|
| | | | | | | -30°C | -40°C | -50°C |
| Required: AWS A5.28 | | | min. 470 | min. 550 | min. 19 | min. 27 | | |
| EN ISO 17632-B | | | min. 460 | 550-740 | min. 17 | | min. 47 | |
| Typical values | M21 | AW | 650 | 680 | 22 | 80 | 70 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 942792N |
| | SPOOL (S300) | 16.0 | 942793N |

Outershield® MC715NI1-H

TOP FEATURES

- Virtually no spatter, high travel speed and excellent wire feeding
- Excellent mechanical properties (CVN >47J) at -50 °C
- Superior product consistency with optimal alloy control

TYPICAL APPLICATIONS

- Offshore
- Steel construction

CLASSIFICATION

AWS A5.28 E70C-6M H4
EN ISO 17632-A T 46 5 1Ni M M 2 H5

CURRENT TYPE

DC+

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | Ni | HDM |
|---------------|------|------|------|-------|-------|------|------------|
| M21 | 0.05 | 1.35 | 0.45 | 0.020 | 0.020 | 0.95 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -40 °C | -50 °C |
| Required: AWS A5.28 | | | min. 470 | min. 550 | min. 24 | min. 27 | |
| EN ISO 17632-A | | | min. 460 | 530-680 | min. 20 | | min. 47 |
| Typical values | M21 | AW | 530 | 600 | 25 | 100 | 80 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (B300) | 16.0 | 941939N |
| | SPOOL (S300) | 16.0 | 941938N |
| | DRUM | 200.0 | 941941 |
| 1.6 | SPOOL (S300) | 16.0 | 941945N |

Outershield® MC80D2-H

TOP FEATURES

- High efficiency metal cored wire for heavy fabrication applications with increased strength and 0.5% Mo
- Excellent arc characteristics provides outstanding operator appeal
- Regular welds with very little silicates

CLASSIFICATION

AWS A5.28 E80T15-M21G2-G
EN ISO 17632-A T 55 3 T15 0 M21 G

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
Flow rate 15-25 l/min

APPROVALS

| ABS | LR | DNV | RINA |
|-----|----|-----|------|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | P | S | HDM |
|---------------|------|------|------|-------|-------|------------|
| M21 | 0.06 | 1.45 | 0.54 | 0.010 | 0.010 | 3 ml/100 g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -30°C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.28 | | | min. 470 | min. 550 | min. 19 | min. 27 |
| EN ISO 17632-A | | | min. 460 | 550-740 | min. 18 | min. 27 |
| Typical values | M21 | AW | 635 | 685 | 25 | 60 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | DRUM | 200.0 | 941950 |

Cor-A-Rosta® 304L

TOP FEATURES

- Stable arc, low spatter and good slag removal
- Improved quality of welds, higher current density coming from the nature of cored wires eliminates typical disadvantages of GMAW and SMAW welding
- Reduced welding cost compared to GMAW
- Very good weld appearance and regularity, optimal slag system helps to achieve best results.

TYPICAL APPLICATIONS

- Steel construction
- Chemical industry
- Shipbuilding
- Food processing

CLASSIFICATION

AWS A5.22 E308LTO-1/-4
 EN ISO 17633-A T 19 9 L R C/M 3

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25 l/min

APPROVALS

| LR | DNV | TÜV |
|----|-----|-----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|------|----|--------------------|
| M21/C1 | 0.03 | 1.3 | 0.7 | 19.5 | 10 | 8 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | +20 °C | -110 °C |
| Required: AWS A5.22 | | | not specified | min. 520 | min. 35 | | |
| EN ISO 17633-A | | | min. 320 | min. 510 | min. 30 | | |
| Typical values | M21/C1 | AW | 400 | 560 | 42 | 80 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 15.0 | 585155 |

FCAW

Cor-A-Rosta® P304L

TOP FEATURES

- Gas shielded flux cored for positional welding of austenitic stainless 304L steels.
- Improved quality of welds, higher current density coming from the nature of cored wires eliminates typical disadvantages of GMAW and SMAW welding
- Reduced welding cost compared to SMAW and GMAW
- Stable arc, low spatter and good slag removal

TYPICAL APPLICATIONS

- Shipbuilding
- Steel construction
- Chemical industry

CLASSIFICATION

AWS A5.22 E308LT1-1/-4
EN ISO 17633-A T 199 L P C/M 2

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
C1 Active gas 100% CO₂
Gas flow 15-25l/min

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|------|----|--------------------|
| M21/C1 | 0.03 | 1.3 | 0.7 | 19.5 | 10 | 8 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | +20° C | -110° C |
| Required: AWS A5.22 | | | not specified | min. 520 | min. 35 | | |
| EN ISO 17633-A | | | min. 320 | min. 510 | min. 30 | | |
| Typical values | M21/C1 | AW | 400 | 560 | 42 | 80 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 15.0 | 585179 |

CLEAROSTA F 304L

TOP FEATURES

- Reduced exposure of welders to welding fumes.
- High alloyed rutile flux cored wire with fast freezing slag for the welding of 308 corrosion resistant Cr Ni-steels.
- Bright appearance of weld metal
- Reduced welding fume (up to -40%).
- Reduced emission of hexavalent Cr content (up to -60%).
- Easy slag removal.

TYPICAL APPLICATIONS

- Steel construction
- Shipbuilding
- General fabrication

CLASSIFICATION

AWS A5.22 E308LT1-1 / E308LT1-4
 EN ISO 17633-A T 19 9 L P C 1/M 1

CURRENT TYPE

DC+

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25 l/min

APPROVALS

| LR | BV | TÜV |
|----|----|-----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|------|----|--------------------|
| M21/C1 | 0.03 | 1.3 | 0.7 | 19.5 | 10 | 3-12 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | -20° C | -196° C |
| Typical values | M21/C1 | AW | ≥350 | ≥520 | ≥35 | ≥40 | ≥27 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.2 | SPOOL (BS300) | 15.0 | 710013 |

FCAW

Cor-A-Rosta® 316L

TOP FEATURES

- Improved quality of welds, higher current density coming from the nature of cored wires eliminates typical disadvantages of GMAW and SMAW welding
- Reduced welding cost compared to GMAW
- Very good weld appearance and regularity, optimal slag system helps to achieve best results.

TYPICAL APPLICATIONS

- Steel construction
- Chemical industry
- Shipbuilding
- Food and brewery

CLASSIFICATION

AWS A5.22 E316LTO-1/ -4
 EN ISO 17633-A T 19 12 3 L R C/M 3

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

APPROVALS

| | |
|----|-----|
| LR | TÜV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | Mo | FN (acc. WRC 1992) |
|---------------|------|-----|-----|----|----|-----|--------------------|
| M21/C1 | 0.03 | 1.3 | 0.5 | 19 | 12 | 2.7 | 8 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | +20° C | -110° C |
| Required: AWS A5.22 | | | not specified | min. 485 | min. 30 | | |
| EN ISO 17633-A | | | min. 320 | min. 510 | min. 25 | | |
| Typical values | M21/C1 | AW | 440 | 580 | 38 | 70 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 15.0 | 585308 |

FCAW

Cor-A-Rosta® P316L

TOP FEATURES

- Improved quality of welds, higher current density coming from the nature of cored wires eliminates typical disadvantages of GMAW and SMAW welding
- Reduced welding cost compared to GMAW
- Very good weld appearance and regularity, optimal slag system helps to achieve best results.

TYPICAL APPLICATIONS

- Steel construction
- Shipbuilding
- Chemical industry
- Food processing and brewery

CLASSIFICATION

AWS A5.22 E316LT1-1/-4
 EN ISO 17633-A T 19 12 3 L P C/M 2

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

APPROVALS

| | | |
|-----|-----|-----|
| ABS | DNV | TÜV |
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | Mo | FN (acc. WRC 1992) |
|---------------|------|-----|-----|----|----|-----|--------------------|
| M21/C1 | 0.03 | 1.3 | 0.5 | 19 | 12 | 2.7 | 6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20°C | -110°C |
| Required: AWS A5.22 | | | not specified | min. 485 | min. 30 | | |
| EN ISO 17633-A | | | min. 320 | min. 510 | min. 20 | | |
| Typical values | M21/C1 | AW | 440 | 580 | 38 | 70 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 5.0 | 585353 |
| | SPOOL (S300) | 15.0 | 585322 |

FCAW

CLEAROSTA F 316L

TOP FEATURES

- The weld metal is resistant to intergranular corrosion up to 400°C, and non-scaling up to 800°C.
- Exhibits outstanding, almost spatter-free, welding properties with very easy slag removal from fillet welds, even in acute angles
- The reduced welding fume (up to -40%) and the lower hexavalent Cr content (up to -60%) of the fume contribute to an improved working environment in the workshop, for all workers. Advantageous in confined spaces and with limited fume extraction systems.
- CLEARINOX F 316 L-PF is used for welding in the horizontal (PD), overhead (PE) and vertical-up (PF) positions.

TYPICAL APPLICATIONS

- Chemical industry
- Steel construction
- Food processing and brewery

CLASSIFICATION

AWS A5.22 E316LT1-1/-4
EN ISO 17633-A T 19 12 3 L P C/M 1

CURRENT TYPE

DC+

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
C1 Active gas 100% CO₂
Gas flow 15-25 l/min

APPROVALS

| LR | BV | DNV | TÜV | DB |
|----|----|-----|-----|----|
| + | + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|------|------|--------------------|
| M21/C1 | 0.04 | 1.4 | 0.6 | 19.0 | 12.0 | 5-10 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | -20°C | -196°C |
| Typical values | M21/C1 | AW | ≥320 | ≥510 | ≥30 | ≥47 | ≥27 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.2 | SPOOL (BS300) | 15.0 | 710015 |

Cor-A-Rosta® 309L

TOP FEATURES

- For welding stainless to mild steel and buffer layers in clad steel
- Excellent weldability and self releasing slag
- High resistance to embrittlement
- Smooth regular bead appearance

TYPICAL APPLICATIONS

- Steel construction
- Maintenance and regeneration - buffer layer.

CLASSIFICATION

AWS A5.22 E309LTO-1/-4
 EN ISO 17633-A T 23 12 L R C/M 3

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

APPROVALS

| | |
|----|-----|
| LR | TÜV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|----|------|--------------------|
| M21/C1 | 0.03 | 1.4 | 0.6 | 24 | 12.5 | 15 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | +20°C | -110°C |
| Required: AWS A5.22 | | | not specified | min. 520 | min. 30 | | |
| EN ISO 17633-A | | | min. 320 | min. 510 | min. 25 | | |
| Typical values | M21/C1 | AW | 445 | 560 | 36 | 45 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 15.0 | 585209 |

FCAW

Cor-A-Rosta® P309L

TOP FEATURES

- All positional flux cored wire for welding austenitic stainless to mild steel.
- Excellent weldability and self releasing slag
- High resistance to embrittlement

TYPICAL APPLICATIONS

- Steel construction
- Shipbuilding

CLASSIFICATION

AWS A5.22 E309LT1-1/-4
 EN ISO 17633-A T 23 12 LP C/M 2

CURRENT TYPE

DC+

WELDING POSITIONS

All except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

APPROVALS

| ABS | LR | DNV | TÜV |
|-----|----|-----|-----|
| + | + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|----|------|--------------------|
| M21/C1 | 0.04 | 1.3 | 0.6 | 24 | 12.5 | 15 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------|---------|
| | | | | | | +20° C | -110° C |
| Required: AWS A5.22 | | | not specified | min. 520 | min. 30 | | |
| EN ISO 17633-A | | | min. 320 | min. 510 | min. 20 | | |
| Typical values | M21/C1 | AW | 445 | 560 | 36 | 45 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S200) | 5.0 | 585285 |
| | SPOOL (S300) | 15.0 | 585223 |

FCAW

CLEAROSTA F 309L

TOP FEATURES

- Advantageous in confined spaces and with limited fume extraction systems
- It exhibits outstanding, almost spatter-free, welding properties and produces finely rippled flat and smooth welds which are free of undercut
- Very easy slag removal
- Due to its fast-freezing slag, it can be used for welding in the horizontal (PD), overhead (PE) and vertical-up (PF) positions.

TYPICAL APPLICATIONS

- Joining high-alloyed Cr and Cr-Ni-(Mo) steels to unalloyed steels.
- Steel construction
- Shipbuilding

CLASSIFICATION

AWS A5.22 E309LT1-1/4
 EN ISO 17633-A T 23 12 L P M 1

CURRENT TYPE

DC+

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
 C1 Active gas 100% CO₂
 Gas flow 15-25l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | FN (acc. WRC 1992) |
|---------------|------|-----|-----|------|----|--------------------|
| M21/C1 | 0.04 | 0.7 | 0.6 | 24.0 | 13 | 10-20 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|----------------|---------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | | -20° C | -60° C |
| Typical values | M21/C1 | AW | ≥320 | ≥520 | ≥30 | ≥40 | ≥27 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|---------------|-------------|-------------|
| 1.2 | SPOOL (BS300) | 15.0 | 710014 |

Cor-A-Rosta® 347

TOP FEATURES

- For Ti or Nb stabilized 304 or equivalent steels
- Excellent resistance in oxidizing environments such as nitric acid
- High resistance to intergranular corrosion

TYPICAL APPLICATIONS

- Chemical and petrochemical industry
- Welding of stabilized austenitic stainless steels.

CLASSIFICATION

AWS A5.22 E347T0-1/4
EN ISO 17633-A T 19 9 Nb R C/M 3

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ (>15-25%) CO₂
C1 Active gas 100% CO₂
Gas flow 15-25l/min

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Shielding gas | C | Mn | Si | Cr | Ni | Nb | FN (acc. WRC 1992) |
|---------------|------|-----|-----|------|----|-----|--------------------|
| M21 | 0.05 | 1.4 | 0.6 | 19.5 | 10 | 0.5 | 5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) +20°C |
|---------------------|---------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.22 | | | not specified | min. 520 | min. 30 | |
| EN ISO 17633-A | | | min. 350 | min. 550 | min. 25 | |
| Typical values | M21 | AW | 435 | 600 | 42 | 90 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|--------------|-------------|-------------|
| 1.2 | SPOOL (S300) | 15.0 | 585544 |

Lincore® 55-G

TOP FEATURES

- To be used on carbon steel and low alloy steel
- Unlimited layers with proper preheat and interpass temperatures and procedures
- Produces a deposit which resists metal-to-metal wear and mild abrasion

TYPICAL APPLICATIONS

- Brake, Bucket, Crane, Crush, Cut
- Drag, Drive, Drum, Extrusion, Hammer
- Ingot, Kiln, Loader, Logging, Mill
- Mine Car, Mix, Open Hearth, Plate, Power Generation
- Rail, Roll, Shovel, Sinter, Teeth, Tractor, Wheel

CLASSIFICATION

EN ISO T Fe2

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

75-90% Argon / Balance CO₂

98% Argon / 2% O₂

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Shielding gas | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|----------------|---------------|------------|----------------------|------------------------|----------------|
| Typical values | | | | | |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.3 | SPOOL | 11.3 | ED037409 |
| | SPOOL | 4.5 | ED036444 |
| 1.1 | SPOOL | 11.3 | ED028176 |
| | DRUM | 227.0 | ED031475 |
| 1.3 | DRUM | 227.0 | ED037410 |
| | SPOOL | 11.3 | ED028177 |
| 1.6 | DRUM | 90.0 | ED037525 |
| | DRUM | 113.3 | ED036653 |
| | DRUM | 227.0 | ED032661 |

FCAW

Innershield® NR®-152

TOP FEATURES

- Designed for high speed welding of specially coated steels
- Soft, consistent arc
- Porosity resistant
- Excellent overlapping capabilities
- Ideal for robotic applications

TYPICAL APPLICATIONS

- Single pass welding on thicknesses from 0.8 mm - 4.8 mm (0.030 - 3/16 in)
- Spot or short intermittent welds
- Continuous welding on galvanized or zinc coated carbon steel
- Automotive
- Transportation

CLASSIFICATION

AWS A5.36 E71T-14
E71T14S

CURRENT TYPE

DC -

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al | Ti | N |
|------|------|------|-------|-------|------|-------|-------|
| 0.30 | 0.99 | 0.24 | 0.013 | 0.007 | 1.63 | 0.003 | 0.051 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) |
|---------------------|------------|----------------------|------------------------|----------------|------------------|
| Required: AWS A5.20 | | not specified | 480 | not specified | not specified |
| Typical values | AW | | 525** | | |

* AW = As welded

** Flat tensile test specimen

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.1 | SPOOL | 11.3 | EDS01702 |
| | DRUM | 227.0 | ED028123 |
| 1.6 | DRUM | 227.0 | ED029066 |
| | COIL | 22.7 | ED012186 |

Innershield® NR®-203 Ni1

TOP FEATURES

- Designed to produce a nickel bearing weld deposit
- Capable of producing weld deposits with impact toughness exceeding 27 J at -29°C
- Color match on weathering steels
- Handles poor fit-up
- Root bead capability

TYPICAL APPLICATIONS

- Roundabout groove welds on heavy wall tubular construction
- Offshore
- Bridges and other structural components made from weathering steels
- Structural fabrication
- NACE applications

CLASSIFICATION

A5.29/A5.36 E71T8-Ni1-H16
 E71T8-A2-Ni1-H16
 EN ISO 17632-A T 42 4 1Ni Y N 1 H10

CURRENT TYPE

DC -

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Ni | Al |
|------|-----|------|-------|-------|-----|------|
| 0.08 | 1.1 | 0.27 | 0.008 | 0.003 | 0.9 | 0.85 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°C |
|---------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.29 | | min. 400 | 480-620 | 20 | 27 |
| Typical values | AW | 465 | 540 | 26 | 115 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.0 | COIL | 6.4 | ED012385 |

FCAW

Innershield® NR®-207

TOP FEATURES

- Vertical down hot, fill and cap passes on standard cross-country pipelines and arctic grade pipe
- Recommended for API grades X42 up to undermatching X70
- High deposition rates

TYPICAL APPLICATIONS

- Standard cross-country pipelines
- Arctic grade pipe up to undermatched X70

CLASSIFICATION

AWS A5.29 E71T8-K6-H16
E71T8-A2-K6-H16

CURRENT TYPE

DC-

WELDING POSITIONS

All positions

APPROVALS

| BV | DNV | TÜV |
|----|-----|-----|
| + | + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al | Ni |
|------|-----|-----|-------|-------|-----|-----|
| 0.07 | 0.9 | 0.2 | 0.005 | 0.003 | 1.0 | 0.8 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°C |
|---------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.29 | | min. 400 | 480-620 | 20 | 27 |
| Typical values | AW | | 535 | 25 | 110 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.7 | COIL | 6.4 | ED016312 |

Innershield® NR®-211-MP

TOP FEATURES

- Versatile welding capability on a variety of base materials
- High operator appeal and good bead appearance
- Easy slag removal
- Fast freezing characteristics accommodate poor fit-up

TYPICAL APPLICATIONS

- Sheet or thin gauge metal
- Galvanized sheet metal
- Robotic/hard automation
- General fabrication
- 5/16" maximum plate thickness for 0.045" and smaller diameters. 1/2" maximum plate thickness for 0.068 - 3/32" diameters.

CLASSIFICATION

A5.20/A5.36 E71T-11
E71T11-AZ-CS3

CURRENT TYPE

DC-

WELDING POSITIONS

All positions

APPROVALS

| | |
|----|----|
| LR | BV |
| + | + |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al |
|------|------|------|-------|-------|-----|
| 0.21 | 0.65 | 0.25 | 0.010 | 0.003 | 1.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) |
|---------------------|------------|----------------------|------------------------|----------------|------------------|
| Required: AWS A5.20 | | min. 400 | 480 | 20 | not specified |
| Typical values | AW | 450 | 610 | 22 | |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 0.8 | SPOOL | 4.5 | ED033130 |
| | SPOOL | 4.5 | ED016354 |
| 0.9 | SPOOL | 11.3 | ED030637 |
| | DRUM | 227.0 | ED029838 |
| | SPOOL | 4.5 | ED016363 |
| | SPOOL | 11.3 | ED030638 |
| 1.1 | DRUM | 227.0 | ED029028 |
| | COIL | 6.4 | ED012506 |
| 1.7 | SPOOL | 11.3 | ED030641 |
| | COIL | 6.4 | ED012508 |
| 2.0 | COIL | 22.7 | ED012509 |
| | COIL | 22.7 | ED013869 |

FCAW

Innershield® NR®-212

TOP FEATURES

- Accommodates a wide range of mild steels
- Fast freeze characteristics accommodate poor fit-up
- Smooth arc performance
- Ease of use

CLASSIFICATION

AWS A5.29 E71TG-G

WELDING POSITIONS

All positions

TYPICAL APPLICATIONS

- Single or multiple pass welding on up to 19 mm (3/4 in) thicknesses
- Truck bodies, tanks, hoppers, racks and scaffolding
- General fabrication
- Robotics

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al | Ni | HDM |
|-----------|-----------|-----------|-------------|-------|---------|-----------|------------|
| 0.06-0.11 | 0.84-1.55 | 0.20-0.33 | 0.006-0.009 | <0.03 | 1.3-1.6 | 1.02-1.15 | 16 ml/100g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Hardness Rockwell B |
|--------------------|------------|----------------------|------------------------|----------------|---------------------|
| Required: AWS 5.29 | | min. 400 | 480-655 | min. 20 | not specified |
| Typical values | AW | 440-505 | 575-6-5 | 24-28 | 89-92 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.1 | SPOOL | 4.5 | ED026090 |
| | SPOOL | 11.3 | ED030639 |
| | SPOOL | 3.6 | ED037028 |
| 1.7 | COIL | 6.4 | ED027803 |
| | SPOOL | 11.3 | ED030642 |
| | COIL | 6.4 | ED027794 |
| 2.0 | SPOOL | 11.3 | ED030646 |
| | COIL | 22.7 | ED026858 |

FCAW

Innershield® NR®-232

TOP FEATURES

- High deposition rates for out-of-position welding
- Penetrating arc
- Fast freezing, easy to remove slag system
- Meets AWS D1.8 seismic lot waiver requirements
- Notes: AWS D1.8 structural steel seismic supplement test data can be found at the Lincoln Electric Certificate Center.

TYPICAL APPLICATIONS

- Structural fabrication, including those subject to seismic requirements
- General plate fabrication
- Hull plate and stiffener welding on ships and barges
- Machinery parts, tanks, hoppers, racks and scaffolding

CLASSIFICATION

A5.20/A5.36 E71T-8-H16
 E71T8-A2-CS3-H16
 EN ISO 17632-A T 42 2 Y N 2 H10

CURRENT TYPE

DC -

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al |
|------|------|------|-------|-------|------|
| 0.18 | 0.65 | 0.27 | 0.006 | 0.004 | 0.55 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|------------|----------------------|------------------------|----------------|------------------|--------|
| | | | | | -20° C | -29° C |
| Required: AWS A5.20 | | min. 400 | 480 | 22 | | 27 |
| Typical values | AW | 490 | 590 | 26 | 65 | 47-75 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|--------------------|
| 1.7 | COIL | 6.1 | ED012518 |
| | SPOOL | 11.3 | ED030643 |
| 1.8 | COIL | 6.1 | ED012522, ED030232 |
| | COIL | 22.7 | ED012523 |
| 2.0 | COIL | 6.1 | ED012525 |
| | SPOOL | 11.3 | ED030647 |

FCAW

Innershield® NR®-233

TOP FEATURES

- Enhanced Feedability – New design increases wire stiffness to aid feedability and promotes smooth arc transfer
- Wire Snap-Off – Easy to break off wire end without tools for better re-strike
- Meets AWS D1.8 requirements for Demand Critical Welds – Three lot tests available at www.lincolnelectric.com/D1.8 to meet AWS D1.8 lot waiver requirements
- Effortless Operability – Welders of all skill levels benefit from the easy to control arc and forgiving weld puddle even out of position

TYPICAL APPLICATIONS

- Seismic structural steel erection and fabrication
- General structural steel erection and fabrication
- Ship and barge fabrication
- Vertical up and overhead fillets and groove welds

CLASSIFICATION

A5.20/A5.36 E71T-8-H8
E71T8-A2-CS3-H8
EN ISO 17632-A T 42 3 Y N 2 H10

CURRENT TYPE

DC -

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al |
|------|------|------|-------|-------|------|
| 0.16 | 0.65 | 0.21 | 0.010 | 0.003 | 0.60 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°C |
|---------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.20 | | min. 400 | 480 | 22 | 27 |
| Typical values | AW | 440 | 570 | 26 | 40 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|------------------------------|
| 1.6 | SPOOL | 5.7 | ED030933 |
| | SPOOL | 11.3 | ED030934, ED031576, ED036576 |
| 2.0 | SPOOL | 11.3 | ED033039, ED036577 |

Innershield® NR®-311

TOP FEATURES

- High deposition rates and fast travel speeds
- Easy slag removal
- Optimal toe wash-in
- Deep penetration
- High resistance to cracking

TYPICAL APPLICATIONS

- Recommended for fillet, lap and butt welds on 3.2 mm (1/8 in) and thicker steel, including some low alloy steels
- Horizontal butt welds, such as column-to-column structural connections
- General fabrication
- Assembly welding

CLASSIFICATION

A5.20/A5.36 E70T-7
E70T7-AZ-CS3

CURRENT TYPE

DC -

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al |
|------|-----|------|-------|-------|-----|
| 0.27 | 0.4 | 0.08 | 0.007 | 0.005 | 1.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|---------------------|------------|----------------------|------------------------|----------------|
| Required: AWS A5.20 | | min. 400 | 480 | 22 |
| Typical values | AW | 430 | 590 | 25 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.0 | COIL | 6.4 | ED014464 |
| | SPOOL | 11.3 | ED030649 |
| 2.4 | COIL | 22.7 | ED012629 |
| | DRUM | 272.0 | ED012628 |
| 2.8 | REEL | 272.0 | ED012633 |

FCAW

Innershield® NR®-440Ni2

TOP FEATURES

- Premium Offshore Weldability – designed to provide optimal weldability in narrow TKY joints and poor fit up conditions
- Excellent Toe Wash-In – expect fast travel speeds and a flat bead face when using vertical-up or vertical-down welding techniques
- Low Temperature Impact Toughness – meets ABS 4YSA and AWS J classification
- Low Diffusible Hydrogen Levels – meets H8 diffusible hydrogen requirements over a range of humidity levels
- ProTech® Packaging – hermetically sealed packaging for moisture resistance
- Q2 Lot – certificate showing actual deposit chemistry and mechanical properties per lot available online

TYPICAL APPLICATIONS

- Offshore

CLASSIFICATION

AWS E71T8-Ni2-JH8
E71T8-A4-Ni2-H8

CURRENT TYPE

DC -

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al | Ni | HDM |
|-----------|-----------|-----------|-------------|-------------|-----------|-----------|-----------|
| 0.01-0.03 | 0.74-1.12 | 0.13-0.17 | 0.007-0.012 | 0.002-0.004 | 0.84-1.07 | 1.77-2.10 | 5 ml/100g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40 °C |
|---------------------|------------|----------------------|------------------------|----------------|-------------------------|
| Required: AWS A5.29 | | min. 400 | 480-655 | min. 22 | |
| EN ISO 17632-A | AW | 400-485 | 490-570 | 22-36 | 215-460 |
| Typical values | | | | | |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.0 | COIL | 6.4 | ED033827 |

Innershield® NS-3M

TOP FEATURES

- Very high deposition rates
- Increased resistance to hydrogen cracking and porosity
- Soft, low penetrating arc for minimal base material admixture

TYPICAL APPLICATIONS

- Open groove welds
- Machinery bases and heavy equipment repair
- Installing wear plates
- 6.4 - 12.7 mm (1/4 - 1/2 in) single pass fillet and lap welds

CLASSIFICATION

AWS E70T-4
E70T4-AZ-CS3
EN ISO 17632-A T 38 Z V N 3

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al |
|-----------|-----------|-----------|-------|-------|-----------|
| 0.20-0.27 | 0.35-0.45 | 0.26-0.30 | 0.011 | 0.004 | 1.30-1.50 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) |
|---------------------|------------|----------------------|------------------------|----------------|
| Required: AWS A5.20 | | 400 | 480-660 | 22 |
| Typical values | AW | 410 | 570-640 | 23 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.0 | COIL | 6.4 | ED012739 |
| | COIL | 22.7 | ED012740 |
| 2.4 | COIL | 22.7 | ED012736 |
| | DRUM | 272.0 | ED012735 |
| 3.0 | COIL | 22.7 | ED012732 |
| | DRUM | 272.0 | ED012731 |

FCAW

Pipelinor® NR®-208-XP

TOP FEATURES

- Vertical down hot, fill and cap pass welding of up to X80 grade pipe
- Capable of producing weld deposits with impact toughness exceeding 122 J at -40°C
- ProTech® hermetically sealed packaging

TYPICAL APPLICATIONS

- Hot, fill and cap pass welding of up to X80 grade pipe
- Cold temperature cross country pipe applications

CLASSIFICATION

AWS E81T8-G
E81T8-A4-K12

CURRENT TYPE

DC-

WELDING POSITIONS

All except vertical up

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al | Ni |
|-----------|-----------|-----------|-------|-------|---------|-----------|
| 0.01-0.04 | 2.21-2.75 | 0.12-0.14 | 0.013 | 0.003 | 0.9-1.2 | 1.04-1.26 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|---------------------|------------|----------------------|------------------------|----------------|------------------|---------------|
| | | | | | -29°C | -40°C |
| Required: AWS A5.29 | | min. 470 | 550-690 | min. 19 | not specified | not specified |
| Typical values | AW | 500-550 | 575-615 | 21-28 | 131-200 | 88-143 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.7 | COIL | 6.4 | ED036650 |
| 2.0 | COIL | 6.4 | ED031968 |

Pipelin[®] NR[®]-208-P

TOP FEATURES

- Vertical down hot, fill and cap pass welding of up to X80 grade pipe
- Designed to meet 27 J (20 ft-lbf) @ 0°C (32°F) in pipe applications
- ProTech[®] hermetically sealed packaging
- Designed to accommodate applications requiring Nickel content of 1% max
- Excellent operator appeal for pipe applications

TYPICAL APPLICATIONS

- Hot, fill and cap pass welding of up to X80 grade pipe
- Warm weather cross country pipe welding applications

CLASSIFICATION

AWS E81T8-G

CURRENT TYPE

DC-

WELDING POSITIONS

All except vertical up

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | P | S | Al | Ni | HDM |
|-----------|-----------|-----------|-------------|--------|---------|-----------|-----------|
| 0.04-0.08 | 1.74-1.99 | 0.33-0.38 | 0.012-0.019 | <0.010 | 0.9-1.2 | 0.65-0.95 | 8 ml/100g |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -29°C |
|---------------------|------------|----------------------|------------------------|----------------|------------------------|
| Required: AWS A5.29 | | min. 470 | 550-690 | min. 19 | not specified |
| Typical values | AW | 480-520 | 600-630 | 24-30 | 50-100 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.0 | COIL | 6.4 | ED032890 |

Lincore® 15CrMn

TOP FEATURES

- Can be used in open arc mode for joining austenitic manganese steel to carbon steel, low alloy steel, austenitic, or stainless steel
- Unlimited layers with proper preheat and interpass temperatures and procedures
- Can be used as a build-up layer before capping with abrasion resistant alloys

TYPICAL APPLICATIONS

- Bar, Bucket, Crush, Cut
- Drag, Dredge, Hammer, Mix
- Open Hearth, Plate, Power Generation, Pump, Rail
- Roll, Screen, Shovel, Teeth, Wheel

CLASSIFICATION

EN ISO T Fe9

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr |
|-----|------|------|------|
| 0.4 | 15.0 | 0.25 | 16.0 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Condition | Typical hardness values |
|---------------|-------------------------|
| As deposited | 18-22 HRc (210-235 HB) |
| Work hardened | 40-50 HRc (375-490 HB) |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | SPOOL | 15.0 | ED037492 |
| 2.0 | SPOOL | 11.3 | ED031126 |
| | COIL | 22.7 | ED022060 |
| 2.7 | COIL | 22.7 | ED022061 |

ADDITIONAL INFORMATION

- All work-hardened base material and previously deposited material should be removed prior to applying a new deposit, since such areas are prone to embrittlement and possible cracking.
- No preheat is required on austenitic manganese steels although a preheat of between 150-200°C may be necessary on carbon and low steels to prevent heat affected zone cracking.
- Narrow stringer beads are preferred to avoid excessive heat build up in the base material. High heat input welds and interpass temperatures above 260°C causes manganese carbide precipitation resulting in embrittlement.
- There is no definite limitation to the number of passes that may be deposited, however, it is good practise to peen each pass immediately after welding to minimise internal stresses and possible distortion and cracking.
- Lincore 15CrMn deposits work harden rapidly making them difficult to machine. For best results carbide or ceramic cutting tools and rigid tooling should be used. Grinding can also be successfully employed.
- For applications involving severe impact and abrasion, a build-up of Lincore 15CrMn coupled with a single pass of Wearshield 60 or Lincore 60-O should be employed.
- The Lincore 15CrMn deposit can not be cut using the oxy-fuel process due to the high chromium content, however, plasma arc and air carbon arc processes are appropriate.

Lincore® 33

TOP FEATURES

- Build-up deposit on carbon steel and low alloy steel base metals
- Unlimited layers
- Delivers tough machinable deposits for build-up or final overlay intended for metal-to-metal wear

TYPICAL APPLICATIONS

- Build-up deposit on carbon steel and low alloy steel base metals

CLASSIFICATION

EN ISO T Fe1

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Al |
|------|-----|-----|-----|-----|
| 0.15 | 2.0 | 0.7 | 2.0 | 1.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Layer | Typical hardness values |
|-------|-------------------------|
| 1 | 21-30 HRc (230-290 HB) |
| 2 | 26-32 HRc (260-300 HB) |
| 3 | 28-34 HRc (250-330 HB) |

Welded on Mild Steel Plate (12mm)

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | SPOOL | 11.3 | ED031117 |
| | COIL | 6.4 | ED011237 |
| 2.0 | SPOOL | 11.3 | ED031118 |

ADDITIONAL INFORMATION

- All work-hardened base material should be removed prior to applying Lincore 33 to prevent embrittlement and cracking.
- Preheat and postweld heat treatment is not generally necessary on C/Mn steels, however, preheat up to 260°C may be necessary on high carbon steels or large complex or restrained components.
- The deposited weld metal can be machined to exact dimensions using high speed or carbide cutting tools.
- There is no limit to the deposit build-up with this electrode.

FCAW

Lincore® 50

TOP FEATURES

- Can be used on low carbon, medium carbon, low alloy, manganese and stainless steels
- Limited to 4 layers
- Delivers an abrasion resistant deposit, even under conditions of moderate impact
- Larger wire diameter sizes may be used for the submerged arc process

TYPICAL APPLICATIONS

- Auger, Bar, Blade, Bucket, Bulldozer, Coal Mining
- Concrete, Crush, Cut/Teeth, Drag, Dredge, Hammer/Crush
- Hoist, Kiln, Mine Car/Wheel, Mix, Pipe Bend, Pipeline, Plate
- Power Generation, Pulverize, Pump, Roll/Hammer, Scrape/Cut, Screen
- Shovel, Shred/Hammer, Slag, Tamper, Teeth, Tractor

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Al | Mo |
|-----|-----|-----|------|-----|-----|
| 2.2 | 1.2 | 1.0 | 11.0 | 0.6 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Layer | Typical hardness values |
|-------|-------------------------|
| 1 | 34-41 HRC (320-380 HB) |
| 2 | 44-53 HRC (415-530 HB) |
| 3 | 48-56 HRC (460-584 HB) |

Welded on Mild Steel Plate (12mm)

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.1 | SPOOL | 4.5 | ED037270 |
| 1.6 | SPOOL | 4.5 | ED037261 |
| | COIL | 22.7 | ED020829 |
| 2.0 | COIL | 22.7 | ED017825 |
| 2.8 | DRUM | 56.0 | ED011274 |

FCAW

ADDITIONAL INFORMATION

- All work-hardened base material and previously deposited hardfacing material should be removed prior to applying a new deposit, since such areas are prone to embrittlement and possible cracking.
- Areas that contain irregularities such as cracks and deep gouges can be repaired locally using Wearshield BU30 or Wearshield 15CrMn prior to hardfacing with Lincore 50.
- Preheat is not necessary when surfacing austenitic substrates such as stainless steels and manganese steels, although the interpass temperature should be limited to about 260 °C for manganese steels.
- For low alloy and carbon carbon steels a preheat of 200 °C is usually sufficient, but is dependent on material thickness and chemistry.
- The weld metal is not machinable by conventional methods although the deposit can be shaped by grinding. Lincore 50 cannot be cut by the oxy-fuel processes. Plasma arc and air-carbon arc processes can be used to both cut and gouge the weld deposit.
- Preheat temperatures similar to those for welding may be necessary to prevent cracking along the cut edge.
- Lincore 50 may also be used in corrosive, cavitation and erosion situations such as the chemical, paper mill, food processing industry, glass manufacturing, power generation and tool manufacturing.

Lincore® 55

TOP FEATURES

- To be used on carbon steel, low alloy steel and manganese steel
- Unlimited layers with proper preheat and interpass temperatures and procedures
- Delivers a deposit which resists metal-to-metal rolling or sliding wear as well as mild abrasion

TYPICAL APPLICATIONS

- Bark removing, Blade, Blower, Brake, Crane, Crush
- Drag, Drive, Drum, Excavate, Extrusion, Hammer
- Ingot, Kiln, Loader, Logging, Mill, Mine Car
- Mix, Open Hearth, Plate, Power Generation, Rail, Roll
- Shovel, Sinter, Teeth, Tractor, Wheel

CLASSIFICATION

EN ISO T Fe2

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Al | Mo |
|------|-----|------|-----|-----|-----|
| 0.45 | 1.4 | 0.55 | 5.3 | 1.4 | 0.8 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Layer | Typical hardness values |
|-------|-------------------------|
| 1 | 50-59 HRc |
| 2 | 50-59 HRc |

Welded on Mild Steel Plate (12mm)

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.1 | SPOOL | 4.5 | ED037254 |
| | SPOOL | 11.3 | ED031120 |
| 2.0 | SPOOL | 11.3 | ED031122 |
| | COIL | 22.7 | ED011280 |
| 2.8 | DRUM | 227.0 | ED037695 |

ADDITIONAL INFORMATION

- All work-hardened base material and previously deposited material should be removed prior to applying a new deposit, since such areas are prone to embrittlement and possible cracking.
- A preheat of up to 250°C is necessary to prevent cracking in situations of high restraint and/or heavy thicknesses. Interpass temperatures between 150 - 300°C do not adversely effect deposit hardness.
- The deposit thickness is usually limited to 2 layers on high carbon or alloy steels and/or situations of high restraint and heavy sections due to the risk of cracking. Higher preheat and interpass temperatures coupled with slow cooling will minimise the risk of cracking.
- The deposited weld metal is not machinable by conventional methods although the deposit can be shaped by grinding.
- The deposit can be softened by annealing at 875°C for one hour and slow cooling (air cool 22- 43HRc, furnace cool 15-17HRc). The hardness can be restored by heating at 875°C followed by water quenching (50-59HRc).
- The component should then be tempered at 150-200°C for one hour (54-59HRc) to retain some toughness.

Lincore® 60-0

TOP FEATURES

- To be used on carbon, low alloy, manganese and stainless steels and cast iron
- Deposit is limited to two layers
- Deposits feature higher alloy levels than to resist both abrasion and moderate impact

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

TYPICAL APPLICATIONS

- Bucket lips
- Crusher hammers
- Ore chutes
- Dozer blades
- Ripper Teeth

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Al |
|-----|-----|-----|------|-----|
| 4.2 | 1.6 | 1.3 | 25.4 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Layer | Typical hardness values |
|-------|-------------------------|
| 1 | 55 - 60 HRc |
| 2 | 58 - 60 HRc |

Welded on Mild Steel Plate (12mm)

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.1 | SPOOL | 4.5 | ED037262 |
| | SPOOL | 11.3 | ED031131 |
| 1.6 | SPOOL | 4.5 | ED037263 |
| | SPOOL | 11.3 | ED031132 |
| 2.0 | SPOOL | 11.3 | ED031133 |
| | COIL | 22.7 | ED019887 |
| | DRUM | 227.0 | ED037493 |

ADDITIONAL INFORMATION

- When welding with Lincore 60-0 stringer beads should be employed. Weaving is not advised since wide weaves generally increase the check crack spacing which can result in deposit spalling.
- Preheat is not necessary when surfacing austenitic substrates such as stainless steels and manganese steels, although the interpass temperature should be limited to about 260°C for manganese steels. For low alloy and high carbon steels a preheat of 200°C is necessary to prevent heat affected zone cracking.
- The weld metal is not machinable or forgeable and it readily check cracks. The deposit thickness is usually limited to 2 layers, as excessive build-up will result in chipping and fragmentation.
- For applications requiring build-ups in excess of 2 layers, buttering layers of Lincore 33, Wearshield BU30 or RepTec 126.
- Alternatively, a preheat of 650°C can be used to eliminate the formation of check cracks.

FCAW

Lincore® M

TOP FEATURES

- Recommended for build-up and repair of Hadfield-type austenitic manganese materials as well as carbon and low alloy steels
- Unlimited layers with proper preheat and interpass temperatures and procedures
- Deposit resists severe impact as well as moderate abrasion

TYPICAL APPLICATIONS

- Bar, Bucket, Crush, Cut, Drag, Dredge
- Hammer, Mill, Mix, Open Hearth, Plate
- Power Generation, Pump, Rail, Roll
- Screen, Shovel, Teeth, Wheel

CLASSIFICATION

EN ISO T Fe9

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Ni |
|-----|------|-----|-----|-----|
| 0.6 | 13.0 | 0.4 | 4.9 | 0.5 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Condition | Typical hardness values |
|---------------|-------------------------|
| As deposited | 18-28 HRc |
| Work hardened | 30-48 HRc |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.1 | SPOOL | 11.3 | ED031128 |
| 1.6 | SPOOL | 11.3 | ED031129 |
| 2.0 | SPOOL | 11.3 | ED031130 |
| | COIL | 22.7 | ED011160 |
| 2.8 | COIL | 22.7 | ED011164 |
| | DRUM | 56.0 | ED011163 |
| | DRUM | 272.0 | ED011162 |

ADDITIONAL INFORMATION

- All work-hardened base material and previously deposited material should be removed prior to applying a new deposit, since such areas are prone to embrittlement and possible cracking.
- No preheat is required on austenitic manganese steels although a preheat of between 150-200°C may be necessary on carbon and low steels to prevent heat affected zone cracking.
- Narrow stringer beads are preferred to avoid excessive heat build up in the base material. High heat input welds and interpass temperatures above 260°C causes manganese carbide precipitation resulting in embrittlement.
- There is no definite limitation to the number of passes that may be deposited, however, it is good practise to peen each pass immediately after welding to minimise internal stresses and possible distortion and cracking.
- Lincore M deposits work harden rapidly making them difficult to machine. For best results carbide or ceramic cutting tools and rigid tooling should be used. Grinding can also be successfully employed.

Lincore® T&D

TOP FEATURES

- Delivers a deposit similar to H12 tool steel
- For build-up of tool steel dies and edges, or applying wear resistance surface on carbon or low alloy steels
- To be used on carbon steel, low alloy steel or tool steel

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

TYPICAL APPLICATIONS

- Punch Dies, Rail, Mill, Brake/Drum, Bar, Pulverizer, Bucket, Crane
- Shear Blades, Teeth, Drag/Bucket/Teeth, Cut/Teeth, Drive Sprocket, Extrusion, Gears, Idlers, Kiln, Mine Car/Wheel
- Ore, Power Shovel, Pulp/paper, Pump, Scarrifier/Teeth, Auger, Power Generation, Tractor

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| C | Mn | Si | Cr | Al | Mo | W |
|------|-----|-----|-----|-----|-----|-----|
| 0.65 | 1.5 | 0.8 | 7.0 | 1.8 | 1.4 | 1.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Layer | Typical hardness values |
|-------|-------------------------|
| 1 | 48 - 55 HRC |
| 2 | 55 - 65 HRC |

Welded on Mild Steel Plate (12mm)

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | SPOOL | 11.3 | ED031134 |

ADDITIONAL INFORMATION

- A preheat and interpass temperature of 325°C, or higher (up to 540°C), are necessary to avoid cracking. It is important to ensure that an adequate "soak" is achieved prior to the welding operation.
- After welding, the component should be covered and slow cooled down to room temperature. Once cooled, the weldment should be post weld heat treated to temper the martensite and toughen the deposit.
- Tempering at 540°C normally produces the optimum combination of hardness and toughness.
- The deposited weld metal is not machinable by conventional methods although the deposit can be shaped by grinding.
- Annealing at 850°C for several hours and slow cooling will reduce the hardness to approximately 30HRC. This deposit can be readily machined. Rehardening is achieved by heating to about 1200°C for several hours to dissolve all carbides and homogenise the steel, followed by air cooling and tempering.
- Lincore T&D cannot be cut by the oxy-fuel processes. Plasma arc and air-carbon arc processes can be used to both cut and gouge the weld deposit. Preheat temperatures similar to those for welding may be necessary to prevent cracking along the cut edge.

SUBMERGED ARC WELDING CONSUMABLES
SAW WIRES & FLUXES



SAW WIRES

MILD STEEL

| | |
|---------------|-----|
| L50M | 244 |
| L60 | 245 |
| L61 | 246 |
| LNS 135 | 247 |

LOW ALLOY STEEL

| | |
|-----------------|-----|
| L-70 | 248 |
| LNS 133TB | 249 |
| LNS 140A | 250 |
| LNS 140TB | 251 |
| LNS 150 | 252 |
| LNS 151 | 253 |
| LNS 160 | 254 |
| LNS 162 | 255 |
| LNS 163 | 256 |
| LNS 164 | 257 |
| LNS 165 | 258 |
| LNS 168 | 259 |

STAINLESS STEEL

| | |
|----------------|-----|
| LNS 304L | 260 |
| LNS 316L | 261 |
| LNS 309L | 262 |
| LNS 347 | 263 |
| LNS 307 | 264 |
| LNS 4462 | 265 |

NICKEL ALLOYS

| | |
|-------------------------|-----|
| LNS NiCro™ 60/20 | 266 |
| LNS NiCroMo 60/16 | 267 |

FLUXES

| | |
|--------------|-----|
| 708GB | 268 |
| 761 | 269 |
| 780 | 270 |
| 781 | 271 |
| 782 | 272 |
| 802 | 273 |
| 839 | 274 |
| 8500 | 275 |
| 860 | 277 |
| 888 | 279 |
| 960 | 281 |
| 995N | 282 |
| 998N | 283 |
| P223 | 285 |
| P230 | 286 |
| P240 | 288 |
| P240X | 290 |
| WTX | 292 |
| P2000 | 293 |
| P2000S | 295 |
| P2007 | 296 |

**SUBMERGED
ARC WELDING
CONSUMABLES
SAW WIRES
& FLUXES**

L50M

TOP FEATURES

- A low carbon, high manganese, medium silicon submerged arc wire primarily designed to be used in multirun conditions
- Capable of producing weld deposits with impact properties exceeding 27 J at -62°C when used with fluxes such as 8500™, P240 or Lincoweld®842-H in As Welded and after post weld heat treatment conditions
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.17 EH12K
EN ISO 14171-A S3Si

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|-----|------|------|
| 0.1 | 1.75 | 0.25 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|----------------------|
| 1.6 | SPOOL | 25.0 | FL50M-16-25VCI |
| | REEL | 300.0 | 107241, FL50M-16-300 |
| | DRUM | 600.0 | FL50M-16-600AC |
| 2.0 | SPOOL | 25.0 | FL50M-2-25VCI |
| | DRUM | 300.0 | FL50M-2-300AC |
| | DRUM | 350.0 | FL50M-2-350 |
| | DRUM | 400.0 | FL50M-2-400 |
| 2.4 | SPOOL | 25.0 | FL50M-24-25VCI |
| | SPOOL | 100.0 | FL50M-24-100 |
| | REEL | 300.0 | FL50M-24-300 |
| | DRUM | 400.0 | FL50M-24-400 |
| | DRUM | 600.0 | FL50M-24-600AC |
| | COIL | 1000.0 | FL50M-24-1T |
| 3.2 | SPOOL | 25.0 | FL50M-32-25VCI |
| | SPOOL | 100.0 | FL50M-32-100 |
| | REEL | 300.0 | FL50M-32-300 |
| | DRUM | 350.0 | FL50M-32-350 |
| | DRUM | 400.0 | FL50M-32-400 |
| | DRUM | 600.0 | FL50M-32-600SF |
| | COIL | 1000.0 | FL50M-32-1T |
| | DRUM | 1000.0 | FL50M-32-1000 |
| 4.0 | SPOOL | 25.0 | FL50M-4-25VCI |
| | SPOOL | 100.0 | FL50M-4-100 |
| | REEL | 300.0 | FL50M-4-300 |
| | DRUM | 350.0 | FL50M-4-350 |
| | DRUM | 400.0 | FL50M-4-400 |
| | DRUM | 600.0 | FL50M-4-600SF |
| | COIL | 1000.0 | FL50M-4-1T |
| | DRUM | 1000.0 | FL50M-4-1000 |
| 4.8 | SPOOL | 25.0 | FL50M-48-25VCI |

SAW

L60

TOP FEATURES

- A low carbon, low manganese, low silicon general purpose wire
- Provides the lowest hardness and is best suited for use with the Lincoln active fluxes
- Excellent choice when welding on oily plates.
- Best suited to use with active fluxes

CLASSIFICATION

AWS A5.17 EL12
EN ISO 14171-A S1

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|------|-----|------|
| 0.09 | 0.5 | 0.06 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|---------------|
| 1.6 | SPOOL | 25.0 | FL60-16-25VCI |
| | DRUM | 25.0 | FL60-2-25VCI |
| 2.0 | REEL | 230.0 | 106893 |
| | DRUM | 350.0 | 107029 |
| | DRUM | 400.0 | FL60-2-400 |
| | SPOOL | 25.0 | FL60-24-25VCI |
| 2.4 | REEL | 230.0 | 106886 |
| | DRUM | 400.0 | FL60-24-400 |
| | DRUM | 600.0 | FL60-24-600AC |
| | DRUM | 1000.0 | FL60-24-1000 |
| 3.2 | SPOOL | 25.0 | FL60-32-25VCI |
| | SPOOL | 100.0 | FL60-32-100 |
| | DRUM | 400.0 | FL60-32-400 |
| | DRUM | 1000.0 | FL60-32-1000 |
| 4.0 | SPOOL | 25.0 | FL60-4-25VCI |
| | SPOOL | 100.0 | FL60-4-100 |
| | REEL | 300.0 | 104752 |
| | DRUM | 350.0 | FL60-4-350 |
| | DRUM | 400.0 | FL60-4-400 |
| | DRUM | 600.0 | FL60-4-600SF |

L61

TOP FEATURES

- Industry standard for submerged arc welding applications
- A low carbon, medium manganese, low silicon general purpose submerged arc wire
- A good choice for a wide range of applications with single or multiple pass subarc welding

CLASSIFICATION

AWS A5.17 EM12K
EN ISO 14171-A S2Si

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|-----|-----|------|
| 0.1 | 1.0 | 0.25 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------------------|
| 1.6 | SPOOL | 25.0 | FL61-16-25VCI |
| | DRUM | 250.0 | FL61-16-250 |
| | DRUM | 350.0 | FL61-16-350 |
| | DRUM | 600.0 | FL61-16-600AC |
| 2.0 | SPOOL | 25.0 | FL61-2-25VCI |
| | SPOOL | 100.0 | FL61-2-100 |
| | DRUM | 300.0 | FL61-2-300AC |
| | REEL | 300.0 | FL61-2-300 |
| | DRUM | 350.0 | FL61-2-350 |
| | DRUM | 500.0 | FL61-2-500 |
| | DRUM | 600.0 | FL61-2-600AC |
| | DRUM | 1000.0 | FL61-2-1000 |
| 2.4 | SPOOL | 25.0 | FL61-24-25VCI |
| | REEL | 300.0 | FL61-24-300 |
| | DRUM | 350.0 | FL61-24-350 |
| | DRUM | 400.0 | FL61-24-400 |
| | COIL | 1000.0 | FL61-24-1T |
| | DRUM | 1000.0 | FL61-24-1000 |
| 3.2 | SPOOL | 25.0 | FL61-32-25VCI |
| | SPOOL | 100.0 | FL61-32-100 |
| | REEL | 300.0 | FL61-32-300 |
| | DRUM | 350.0 | 105506 |
| | DRUM | 400.0 | FL61-32-400 |
| | DRUM | 600.0 | FL61-32-600SF |
| | COIL | 1000.0 | FL61-32-1T |
| | DRUM | 1000.0 | FL61-32-1000 |
| 4.0 | SPOOL | 25.0 | FL61-4-25VCI |
| | SPOOL | 100.0 | FL61-4-100, FL61-4-100E |
| | REEL | 300.0 | FL61-4-300 |
| | DRUM | 350.0 | 105438 |
| | DRUM | 400.0 | FL61-4-400 |
| | DRUM | 600.0 | FL61-4-600SF |
| | COIL | 1000.0 | FL61-4-1T |
| | DRUM | 1000.0 | FL61-4-1000 |
| 4.8 | SPOOL | 25.0 | FL61-48-25VCI |
| | SPOOL | 100.0 | FL61-48-100 |

LNS 135

TOP FEATURES

- Generate a soft weld metal deposit in combination with neutral fluxes
- Used on 355MPa grade or below
- Good behavior on oily plates

CLASSIFICATION

AWS A5.17 EM12K
EN ISO 14171-A S2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si |
|-----|-----|------|
| 0.1 | 1.0 | 0.10 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|--------------------------------|
| 2.4 | SPOOL | 25.0 | LNS135-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS135-32-25VCI |
| 4.0 | DRUM | 400.0 | LNS135-4-25VCI LNS135-4-400 |

L-70

TOP FEATURES

- A low carbon, medium manganese, low silicon, 1/2% molybdenum wire used for single or multiple pass welds
- A standard choice for pipe fabrication and other limited pass applications
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EA1
EN ISO 14171-A S2Mo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Mo |
|-----|-----|------|-----|
| 0.1 | 0.9 | 0.10 | 0.5 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|---------------|
| 2.0 | SPOOL | 25.0 | FL70-2-25VCI |
| | DRUM | 400.0 | FL70-2-400 |
| 2.4 | SPOOL | 25.0 | FL70-24-25VCI |
| | SPOOL | 25.0 | FL70-32-25VCI |
| 3.2 | SPOOL | 100.0 | FL70-32-100 |
| | DRUM | 350.0 | FL70-32-350 |
| | DRUM | 600.0 | FL70-32-600SF |
| | COIL | 1000.0 | FL70-32-1T |
| 4.0 | SPOOL | 25.0 | FL70-4-25VCI |
| | SPOOL | 100.0 | FL70-4-100 |
| | DRUM | 350.0 | FL70-4-350 |
| | DRUM | 600.0 | FL70-4-600SF |
| | COIL | 1000.0 | FL70-4-1T |
| 4.8 | SPOOL | 25.0 | FL70-48-25VCI |
| | SPOOL | 100.0 | FL70-48-100 |

LNS 133TB

TOP FEATURES

- High Manganese and microalloying elements to optimize impact toughness in 2-run technique at low temperature
- Molybdenum free composition to limit the secondary hardening phenomena
- Suitable for pipe grade up to X90

CLASSIFICATION

AWS A5.23 EG
EN ISO 14171-A SZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ti | B |
|------|------|------|------|-------|
| 0.08 | 1.55 | 0.25 | 0.15 | 0.015 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|------------------|
| 4.0 | SPOOL | 25.0 | LNS133TB-4-25VCI |
| | DRUM | 350.0 | LNS133TB-4-350 |
| | REEL | 350.0 | LNS133TB-4-350R |
| | DRUM | 600.0 | LNS133TB-4-600SF |
| | COIL | 1000.0 | LNS133TB-4-1T |
| 4.8 | DRUM | 350.0 | LNS133TB-48-350 |

LNS 140A

TOP FEATURES

- A low carbon, medium manganese, low silicon, 0.5% molybdenum wire used for single or multiple pass welds
- A standard choice for pipe fabrication and other limited pass applications
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EA2
EN ISO 14171-A S2Mo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Mo |
|-----|-----|------|-----|
| 0.1 | 1.0 | 0.10 | 0.5 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------------|
| 2.0 | SPOOL | 25.0 | LNS140A-2-25VCI |
| | REEL | 300.0 | LNS140A-2-300 |
| | DRUM | 350.0 | LNS140A-2-350 |
| | DRUM | 400.0 | 107036 |
| | DRUM | 600.0 | LNS140A-2-600AC |
| 2.4 | SPOOL | 25.0 | LNS140A-24-25VCI |
| | DRUM | 400.0 | LNS140A-24-400 |
| 3.2 | SPOOL | 25.0 | LNS140A-32-25VCI |
| | SPOOL | 100.0 | LNS140A-32-100 |
| | DRUM | 350.0 | 105407 |
| | DRUM | 400.0 | LNS140A-32-400 |
| | DRUM | 600.0 | LNS140A-32-600SF |
| | DRUM | 1000.0 | 106725, LNS140A-32-1T |
| 4.0 | DRUM | 1000.0 | LNS140A-32-1000 |
| | SPOOL | 25.0 | LNS140A-4-25VCI |
| | SPOOL | 100.0 | LNS140A-4-100 |
| | DRUM | 200.0 | 107159 |
| | DRUM | 350.0 | 105346, 105414 |
| | DRUM | 400.0 | LNS140A-4-400 |
| | DRUM | 600.0 | LNS140A-4-600SF |
| | DRUM | 1000.0 | LNS140A-4-1T |
| 4.8 | DRUM | 1000.0 | LNS140A-4-1000 |
| | SPOOL | 25.0 | LNS140A-48-25VCI |
| | SPOOL | 100.0 | LNS140A-48-100 |
| | DRUM | 300.0 | LNS140A-48-300 |
| | DRUM | 600.0 | LNS140A-48-600SF |
| | COIL | 1000.0 | LNS140A-48-1T |

SAW

LNS 140TB

TOP FEATURES

- 0.5%Mo and microalloying elements to optimize impact toughness in 2-run technique at low temperature
- Suitable for limited passes applications
- Suitable for pipe grade up to X90

CLASSIFICATION

AWS A5.23 EA2TiB
EN ISO 14171-A S2MoTiB

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Mo | Ti | B |
|------|-----|------|-----|------|-------|
| 0.06 | 1.1 | 0.20 | 0.5 | 0.13 | 0.013 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------------|
| 2.4 | SPOOL | 25.0 | LNS140TB-24-25VCI |
| | SPOOL | 25.0 | LNS140TB-32-25VCI |
| 3.2 | DRUM | 600.0 | LNS140TB-32-600SF |
| | COIL | 1000.0 | LNS140TB-32-1T |
| | SPOOL | 25.0 | LNS140TB-4-25VCI |
| 4.0 | SPOOL | 100.0 | LNS140TB-4-100E |
| | REEL | 350.0 | LNS140TB-4-350R |
| | DRUM | 400.0 | LNS140TB-4-400 |
| | DRUM | 600.0 | LNS140TB-4-600SF |
| | COIL | 1000.0 | LNS140TB-4-1T |
| | SPOOL | 25.0 | LNS140TB-48-25VCI |
| 4.8 | DRUM | 300.0 | LNS140TB-48-300 |
| | COIL | 1000.0 | LNS140TB-48-1T |

LNS 150

TOP FEATURES

- For maximal operating temperature of 550°C
- Low bruscato factor
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EB2R
EN ISO 24598-A S Cr Mo1

TYPICAL APPLICATIONS

- Creep resistant steel

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Mo | Cr | P |
|------|-----|------|-----|-----|--------|
| 0.13 | 0.8 | 0.15 | 0.5 | 1.2 | <0.010 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 1.6 | SPOOL | 25.0 | LNS150-16-25VCI |
| | SPOOL | 25.0 | LNS150-2-25VCI |
| 2.0 | DRUM | 350.0 | LNS150-2-350 |
| | DRUM | 600.0 | LNS150-2-600AC |
| 2.4 | SPOOL | 25.0 | LNS150-24-25VCI |
| | SPOOL | 25.0 | LNS150-32-25VCI |
| 3.2 | COIL | 1000.0 | LNS150-32-1T |
| | DRUM | 1000.0 | LNS150-32-1000 |
| 4.0 | SPOOL | 25.0 | LNS150-4-25VCI |
| | DRUM | 400.0 | LNS150-4-400 |

LNS 151

TOP FEATURES

- For maximal operating temperature of 600°C
- Low bruscato factor
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EB3R
EN ISO 24598-A S Cr Mo2

TYPICAL APPLICATIONS

- Creep resistant steel
- Can be used with low basicity index flux for single pass fillet welds dedicated to fin to tube welding for heat exchangers (waterwalls as an example).

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Mo | P | Cr |
|------|-----|------|-----|--------|-----|
| 0.10 | 0.6 | 0.12 | 1.0 | <0.010 | 2.5 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.4 | SPOOL | 25.0 | 596681 |
| 3.2 | SPOOL | 25.0 | 596694 |

LNS 160

TOP FEATURES

- 1%Nickel addition
- Optimum results in multipass technique
- Comply with NACE requirement

CLASSIFICATION

AWS A5.23 ENi1
EN ISO 14171-A S2Ni1

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni |
|------|-----|------|-----|
| 0.10 | 1.1 | 0.15 | 0.9 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 2.4 | SPOOL | 25.0 | LNS160-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS160-32-25VCI |
| 4.0 | SPOOL | 25.0 | LNS160-4-25VCI |

LNS 162

TOP FEATURES

- 2% Ni alloyed wire
- Excellent impact toughness at -60°C
- Recommended for multirun technique in combination with basic fluxes

CLASSIFICATION

AWS A5.23 ENi2
EN ISO 14171-A S2Ni2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni |
|------|-----|------|-----|
| 0.10 | 1.1 | 0.15 | 2.2 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 2.0 | REEL | 300.0 | LNS162-2-300 |
| 2.4 | SPOOL | 25.0 | LNS162-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS162-32-25VCI |
| 4.0 | SPOOL | 25.0 | LNS162-4-25VCI |
| | DRUM | 350.0 | LNS162-4-350 |

LNS 163

TOP FEATURES

- Contains Nickel and Copper
- For Cor-ten steels and equivalent
- Recommended with P240 and P230 fluxes

CLASSIFICATION

AWS A5.23 EG
EN ISO 14171-A S2 Ni1Cu

TYPICAL APPLICATIONS

- Weathering steel structure

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cu | Cr | S | P |
|------|-----|------|-----|-----|---------|----------|----------|
| 0.11 | 1.0 | 0.25 | 0.7 | 0.5 | 0.2 max | 0.02 max | 0.02 max |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 2.0 | DRUM | 400.0 | LNS163-2-400 |
| | DRUM | 350.0 | LNS163-24-350 |
| 2.4 | DRUM | 400.0 | LNS163-24-400 |
| | SPOOL | 25.0 | LNS163-32-25VCI |
| 3.2 | SPOOL | 25.0 | LNS163-4-25VCI |
| | SPOOL | 100.0 | LNS163-4-100 |
| | DRUM | 400.0 | LNS163-4-400 |

LNS 164

TOP FEATURES

- Deliver a high strength and low temperature fracture toughness weld metal
- Compatible with NACE requirement on Ni content
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EF3
EN ISO 14171-A S3Ni1Mo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Mo |
|------|------|------|------|-----|
| 0.12 | 1.75 | 0.10 | 0.95 | 0.5 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 2.4 | SPOOL | 25.0 | LNS164-24-25VCI |
| | DRUM | 350.0 | LNS164-24-350 |
| 3.2 | SPOOL | 25.0 | LNS164-32-25VCI |
| | DRUM | 400.0 | LNS164-32-400 |
| 4.0 | SPOOL | 25.0 | LNS164-4-25VCI |
| | DRUM | 350.0 | LNS164-4-350 |
| | DRUM | 600.0 | LNS164-4-600SF |
| 4.8 | SPOOL | 25.0 | LNS164-48-25VCI |

LNS 165

TOP FEATURES

- 1% bearing Nickel and 0.2% Molybdenum wire to combine high strength and high toughness properties
- Impact toughness properties down to -60°C
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available
- Comply with NACE requirement

CLASSIFICATION

AWS A5.23 ENi5
EN ISO 14171-A S3Ni1Mo0,2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Mo |
|------|-----|------|------|-----|
| 0.08 | 1.4 | 0.20 | 0.95 | 0.2 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 2.0 | SPOOL | 25.0 | LNS165-2-25VCI |
| | SPOOL | 25.0 | LNS165-24-25VCI |
| 2.4 | SPOOL | 100.0 | LNS165-24-100 |
| | DRUM | 350.0 | LNS165-24-350 |
| 3.2 | SPOOL | 25.0 | LNS165-32-25VCI |
| | SPOOL | 25.0 | LNS165-4-25VCI |
| 4.0 | SPOOL | 100.0 | LNS165-4-100 |
| | DRUM | 1000.0 | LNS165-4-1000 |
| 4.8 | SPOOL | 25.0 | LNS165-48-25VCI |

LNS 168

TOP FEATURES

- For 690MPa yield strength base material
- Recommended with P230 and P240 fluxes
- Good impacts down to -40°C

CLASSIFICATION

AWS A5.23 EG
EN ISO 26304-A S3Ni2.5CrMo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Mo | Cr |
|------|-----|------|-----|-----|-----|
| 0.10 | 1.6 | 0.15 | 2.3 | 0.6 | 0.7 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|---------------|
| 2.4 | SPOOL | 25.0 | 597028 |
| 3.2 | SPOOL | 25.0 | 597059 |
| | REEL | 300.0 | LNS168-32-300 |
| 4.0 | SPOOL | 25.0 | 598216 |

LNS 304L

TOP FEATURES

- High resistance to intergranular corrosion and oxidizing environments

CLASSIFICATION

AWS A5.9 ER308L
EN ISO 14343-A S 199 L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni |
|-------|-----|-----|----|----|
| 0.015 | 1.8 | 0.4 | 20 | 10 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|------------------|
| 2.0 | SPOOL | 25.0 | LNS304L-2-25VCI |
| 2.4 | SPOOL | 25.0 | LNS304L-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS304L-32-25VCI |
| 4.0 | SPOOL | 25.0 | LNS304L-4-25VCI |

LNS 316L

TOP FEATURES

- High resistance to intergranular corrosion and general corrosion conditions
- The 2-3% molybdenum improve pitting corrosion resistance of the weld deposit

CLASSIFICATION

AWS A5.9 ER316L
EN ISO 14343-A S 19 12 3 L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo |
|-------|------|-----|------|----|------|
| 0.015 | 1.75 | 0.4 | 18.5 | 12 | 2.75 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|------------------|
| 2.4 | SPOOL | 25.0 | LNS316L-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS316L-32-25VCI |
| 4.0 | SPOOL | 25.0 | LNS316L-4-25VCI |

LNS 309L

TOP FEATURES

- Designed to be used primarily with basic fluxes that recover nearly all of the wire chromium in the deposit
- Reduced carbon level (0.03% max) that offers increased resistance to inter-granular corrosion

CLASSIFICATION

| | |
|----------------|-----------|
| AWS A5.9 | ER309L |
| EN ISO 14343-A | S 23 12 L |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cr |
|------|-----|-----|----|----|
| 0.02 | 1.8 | 0.4 | 13 | 24 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|------------------|
| 2.4 | SPOOL | 25.0 | LNS309L-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS309L-32-25VCI |
| 4.0 | SPOOL | 25.0 | LNS309L-4-25VCI |

LNS 347

TOP FEATURES

- The addition of niobium reduces intergranular corrosion in severe operating conditions
- Niobium stabilized stainless steel electrodes used for the welding of types 347 and 321 stainless and stainless clad steels
- Recommended with P2000 flux

CLASSIFICATION

AWS A5.9 ER347
EN ISO 14343-A S 19 9 Nb

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cr | Mo | Nb |
|------|-----|-----|-----|------|-----|-----|
| 0.04 | 1.6 | 0.4 | 9.7 | 19.5 | 0.1 | 0.6 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 2.4 | SPOOL | 25.0 | LNS347-24-25VCI |
| 3.2 | SPOOL | 25.0 | LNS347-32-25VCI |
| 4.0 | SPOOL | 25.0 | LNS347-4-25VCI |

LNS 307

TOP FEATURES

- Self hardening wire
- Typically used on difficult-to-weld steels such as armour plates
- Recommended with P2000 and P2007 fluxes

CLASSIFICATION

| | |
|----------------|-----------|
| AWS A5.9 | ER307 |
| EN ISO 14343-A | S 18 8 Mn |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni |
|------|-----|-----|----|-----|
| 0.07 | 7.0 | 0.6 | 19 | 8.9 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-----------------|
| 3.2 | SPOOL | 25.0 | LNS307-32-25VCI |

LNS 4462

TOP FEATURES

- For duplex stainless steel

CLASSIFICATION

AWS A5.9 ER2209
EN ISO 14343-A S 22 9 3 N L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cr | Mo | N |
|-------|-----|-----|-----|----|-----|------|
| 0.015 | 1.6 | 0.5 | 8.6 | 23 | 3.1 | 0.16 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 2.4 | SPOOL | 25.0 | 598797 |
| 3.2 | SPOOL | 25.0 | 598780 |

LNS NiCro 60/20

TOP FEATURES

- Used for joining and wire cladding
- Corrosion resistant in a large range of media/conditions
- Recommended with P2007 flux on 9%Ni LNG tank application

CLASSIFICATION

AWS A5.14 ERNiCrMo-3
EN ISO 18274 S Ni 6625

TYPICAL APPLICATIONS

- LNG Tank welding

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Cr | Ni | Mo | Nb | Fe |
|------|------|-----|----|----|-----|-----|-----|
| 0.05 | 0.02 | 0.1 | 22 | 65 | 8.7 | 3.7 | 0.1 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | SPOOL | 25.0 | 598717 |
| 2.0 | SPOOL | 25.0 | 598718 |
| 2.4 | SPOOL | 25.0 | 598803 |

LNS NiCrMo 60/16

TOP FEATURES

- Matches C276 chemistry
- Low sensitivity to hot cracking
- Recommended with P2007 flux on 9%Ni LNG tank application

CLASSIFICATION

| | |
|--------------|------------|
| AWS A5.14 | ERNiCrMo-4 |
| EN ISO 18274 | S Ni 6276 |

TYPICAL APPLICATIONS

- LNG Tank welding

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

| C | Mn | Si | Ni | Cr | Mo | W | Fe |
|-------|-----|------|----|----|----|-----|-----|
| 0.006 | 0.5 | 0.04 | 58 | 16 | 16 | 3.6 | 5.8 |

PACKAGING AND AVAILABLE SIZES

| Wire diameter (mm) | Packaging | Weight (kg) | Item number |
|--------------------|-----------|-------------|-------------|
| 1.6 | SPOOL | 25.0 | 598377 |
| 2.4 | SPOOL | 25.0 | 598384 |

708GB

TOP FEATURES

- Smooth bead appearance
- Initially design for gas bottle welding
- Very suitable as well for high speed fillet weld

CLASSIFICATION

| | | |
|------------------|----------------------------------|--------------|
| Flux | EN ISO 14174: S A AR 1 99 AC H10 | |
| Flux/wire | EN ISO 14171-A | AWS A5.17 |
| 708GB / L-60 | S 42 0 AR S1 | F7A0 - EL12 |
| 708GB / L-61 | S 42 0 AR S2Si | F7A0 - EM12K |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S |
|------------|------|-----|------|-------|------|
| L-60 | 0.08 | 1.4 | 0.75 | 0.023 | 0.02 |
| L-61 | 0.09 | 1.6 | 0.9 | 0.023 | 0.02 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -18°C |
|------------|------------|----------------------|------------------------|----------------|------------------------|
| L-60 | MR | 440 | 570 | 33 | 30 |
| L-61 | MR | 490 | 630 | 30 | 50 |

* MR = Multi-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|------------|
| Current type | DC(+/-)/AC |
| Solidification speed | High |
| Basicity (Boniszewski) | 0.65 |
| Density (kg/dm ³) | 1.3 |
| Grain size (EN ISO 14174) | 2 - 20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| PE BAG | 25.0 | 111552 |

761

TOP FEATURES

- Manganese alloying and carbon reducing flux designed to provide superior crack resistance
- Slow freezing slag for a wide, flat weld
- Excellent resistance to cracking in single pass applications
- Also available in fine and coarse grain versions

CLASSIFICATION

| Flux | EN ISO 14174: S A CS/MS 1 88 AC EN H5 | | |
|----------------|---------------------------------------|--------------------|-------------------|
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 761 / L-60 | S 38 2 CS/MS S1 | | F7A2-EL12 |
| 761 / L-61 | S 42 2 CS/MS S2Si | S 4T 0 CS/MS S2Si | F7A2-EM12K |
| 761 / LNS 140A | S 46 0 CS/MS S2Mo | S 4T 2 CS/MS S2Mo | F8A0-EA2-G |
| 761 / L-70 | S 46 0 CS/MS S2Mo | S 4T 2 CS/MS S2Mo | F8A0-EA1-G |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|-----------------|------|-----|-----|-------|--------|-----|
| L-60 | 0.05 | 1.5 | 0.7 | <0.03 | <0.025 | |
| L-61 | 0.07 | 1.7 | 0.9 | <0.03 | <0.025 | |
| LNS 140A (L-70) | 0.06 | 1.7 | 0.8 | <0.03 | <0.025 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|-----------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | 0°C | -20°C |
| L-60 | MR | 380 | 500 | 28 | 80 | 50 |
| L-61 | MR | 470 | 560 | 28 | 100 | 50 |
| L-61 | TR | >420 | >540 | | 65 | |
| LNS 140A (L-70) | MR | 480 | 600 | | 80 | 40 |
| LNS 140A (L-70) | TR | >440 | >540 | | 100 | 55 |

* MR = Multi-Run; TR = Two-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------------------------|
| Current type | DC(+/-)/AC |
| Basicity (Boniszewski) | 0.8 |
| Solidification speed | Low, viscous slag |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 761: 1-16 / 761-CG: 1-20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-----------------------------|
| PE BAG | 25.0 | 111040, FX761-25 |
| SRB BAG | 25.0 | FX761-25-C-SRB, FX761-25SRB |
| DRUM | 250.0 | 111842, 111880 |

780

TOP FEATURES

- Fast freezing slag for easy removal and minimized spilling on circumferential welds
- Excellent bead shape and slag removal
- Good resistance to moisture contamination for reduced porosity
- Also available in fine and coarse grain versions

CLASSIFICATION

| Flux | EN ISO 14174: S A AR/AB 1 78 AC H5 | | |
|----------------|------------------------------------|--------------------|-------------------|
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 780 / L-60 | S 42 0 AR/AB S1 | S 4T 0 AR/AB S1 | F7A0-EL12 |
| 780 / L-61 | S 42 0 AR/AB S2Si | S 4T 2 AR/AB S2Si | F7A2-EM12K |
| 780 / LNS 140A | | S 4T 2 AR/AB S2Mo | F8A2-EA2-G |
| 780 / L-70 | | S 4T 2 AR/AB S2Mo | F8A2-EA1-G |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|-----------------|------|-----|-----|-------|--------|-----|
| L-60 | 0.07 | 1.4 | 0.6 | <0.03 | <0.025 | |
| L-61 | 0.07 | 1.6 | 0.7 | <0.03 | <0.025 | |
| LNS 140A (L-70) | 0.07 | 1.6 | 0.6 | <0.03 | <0.025 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|-----------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | 0°C | -20°C |
| L-60 | MR | >420 | 510 | 28 | 50 | |
| L-61 | TR | >420 | >540 | 28 | | 50 |
| LNS 140A (L-70) | TR | >420 | >550 | 25 | | 60 |

* MR = Multi-Run; TR = Two-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|---|
| Current type | DC(+/-)/AC |
| Basicity (Boniszewski) | 0.7 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.4 |
| Grain size (EN ISO 14174) | 780: 1-20 / 780-CG: 2-20 / 780-FG: 1-16 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|--------------------------|
| PE BAG | 25.0 | 110562, 110579, FX780-25 |
| SRB BAG | 25.0 | FX780-25SRB |
| DRUM | 250.0 | 111781 |

781

TOP FEATURES

- Features fast follow characteristics that allow for uniform welds at high speeds without undercut or voids
- Recommended for high speed, limited pass welding on clean plate and sheet steel
- Good wetting action

CLASSIFICATION

| | | |
|------------------|---------------------------------|-------------------|
| Flux | EN ISO 14174: S A ZS 1 87 AC H5 | |
| Flux/wire | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 781 / L-60 | | F7A0-EL12 |
| 781 / L-61 | S 4 T 0 ZS S2Si | F7A0-EM12K |
| 781 / L-50M | S 4 T 2 ZS S3Si | |
| 761 / LNS 140A | S 4 T 2 ZS S2Mo | |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|------------------|------|-----|-----|-------|-------|-----|
| L-61 | 0.05 | 1.3 | 0.9 | <0.03 | <0.02 | |
| L-50M (LNS 133U) | 0.06 | 1.6 | 1.0 | <0.03 | <0.02 | |
| LNS 140A (L-70) | 0.06 | 1.3 | 0.9 | <0.03 | <0.02 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Impact ISO-V (J) -20°C |
|------------------|------------|----------------------|------------------------|------------------------|
| L-61 | TR | >420 | >540 | 50 |
| L-50M (LNS 133U) | TR | >450 | >560 | 60 |
| LNS 140A (L-70) | TR | >490 | >580 | 65 |

* TR = Two-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|------------------|
| Current type | DC(+/-)/AC |
| Basicity (Boniszewski) | 0.7 |
| Solidification speed | Fast, fluid slag |
| Density (kg/dm ³) | 1.5 |
| Grain size (EN ISO 14174) | 1 - 16 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| SRB BAG | 25.0 | FX781-25SRB |
| DRUM | 250.0 | 110050 |

782

TOP FEATURES

- Recommended for high speed fillet weld
- Excellent slag detachability
- Available in standard and fine grain size

CLASSIFICATION

| Flux | EN ISO 14174: S A AR/AB 1 76 AC H5 | | |
|----------------|------------------------------------|--------------------|-------------------|
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 782 / L-60 | S 42 0 AR/AB S1 | S 4T A AR/AB S1 | |
| 782 / LNS 135 | | S 4T 0 AR/AB S2 | F7AZ-EM12 |
| 782 / L-61 | S 46 0 AR/AB S2Si | S 4T 0 AR/AB S2Si | F7AZ-EM12K |
| 782 / L-50M | S 46 0 AR/AB S3Si | S 4T 2 AR/AB S3Si | |
| 782 / LNS 140A | | S 4T 2 AR/AB S2Mo | |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|------------------|------|------|-----|-------|--------|-----|
| L-60 | 0.07 | 1.0 | 0.6 | <0.03 | <0.025 | |
| LNS 135 | 0.07 | 1.15 | 0.7 | <0.03 | <0.025 | |
| L-61 | 0.07 | 1.15 | 0.8 | <0.03 | <0.025 | |
| L-50M (LNS 133U) | 0.06 | 1.7 | 1.0 | <0.03 | <0.025 | |
| LNS 140A (L-70) | 0.07 | 1.2 | 0.7 | <0.03 | <0.025 | 0.4 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Impact ISO-V (J) | |
|------------------|------------|----------------------|------------------------|------------------|-------|
| | | | | 0°C | -20°C |
| L-60 | TR | >420 | >520 | 45 | |
| LNS 135 | TR | >420 | >520 | 55 | |
| L-61 | TR | >420 | >520 | 60 | |
| L-50M (LNS 133U) | TR | >460 | >550 | 65 | 50 |
| LNS 140A (L-70) | TR | >460 | >600 | 70 | 50 |

* MR = Multi-Run; TR = Two-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------------------------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 0.4 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.4 |
| Grain size (EN ISO 14174) | 782: 1-20 / 782-FG: 1-16 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|--------------------|
| PE BAG | 25.0 | 111033, FX782-25-F |
| BAG | 500.0 | FX782-500-F |

802

TOP FEATURES

- Neutral hardfacing flux
- Excellent slag removal even with high interpass temperature
- Compatible with a wide range of wire grade

CLASSIFICATION

Flux EN ISO 14174: S A CS 3 55 DC H5

Flux/wire

Hardfacing solid and flux cored wire

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | Cr | Ni | Mo | V | W |
|---------------|------|-----|-----|------|-----|-----|------|-----|
| LINCORE 102W | 0.28 | 1.5 | 0.4 | 6.5 | | 1.0 | 0.15 | 1.0 |
| LINCORE 423L | 0.15 | 1.2 | 0.4 | 11.5 | 2.0 | 1.0 | 0.15 | |
| LINCORE 423Cr | 0.15 | 1.2 | 0.4 | 13.5 | 2.0 | 1.0 | 0.15 | |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Hardness: HRC in 6 layers hardfacing application after 2 hours postweld tempering at | | | | | |
|---------------|--|-------|-------|-------|-------|-------|
| | AW* | 426°C | 482°C | 538°C | 593°C | 649°C |
| LINCORE 102W | 51 | 50 | 50 | 51 | 40 | 35 |
| LINCORE 423L | 43 | 42 | 46 | 38 | 33 | 32 |
| LINCORE 423Cr | 46 | 45 | 46 | 38 | 34 | 32 |

* AW = As welded

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| SRB BAG | 25.0 | FX802-25 |

839

TOP FEATURES

- Suitable for mild steel, low alloy and standard stainless steel grades
- Excellent bead finishing appearance with stainless grades
- Suitable as the one flux workshop solution

CLASSIFICATION

| | |
|------------------|---------------------------------|
| Flux | EN ISO 14174: S A FB 1 66 AC H5 |
| Flux/wire | AWS A5.17 / A5.23 |
| 839/L60 | F6A2-EL12 |
| 839/LNS135 | F6A4-EM12 |
| 839/L-61 | F7A5-EM12K / F6P6-EM12K |
| 839/L-50M | F7A6-EH12K / F7P8-EH12K |
| 839/LNS140A | F7A4-EA2-A2 |
| 839/LNS164 | F9A0-EF3-F3 / F9P4EF3-F3 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo | Ni |
|-----------------|------|------|-----|--------|-------|------|------|
| L-60 | 0.04 | 0.85 | 0.2 | <0.01 | <0.01 | | |
| LNS 135 | 0.05 | 1.2 | 0.2 | <0.015 | <0.01 | | |
| L-61 | 0.07 | 1.2 | 0.3 | <0.015 | <0.01 | | |
| L-50M | 0.07 | 1.7 | 0.3 | <0.015 | <0.01 | | |
| LNS 140A (L-70) | 0.06 | 1.2 | 0.2 | <0.015 | <0.01 | 0.45 | |
| LNS 164 | 0.07 | 1.7 | 0.3 | <0.015 | <0.01 | 0.45 | 0.80 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|-------|
| | | | | | -20°C | -40°C | -50°C | -60°C |
| L-60 | AW | 390 | 470 | 30 | 100 | | | |
| LNS 135 | AW | 410 | 490 | | 100 | 50 | | |
| L-61 | AW | 440 | 530 | 29 | 130 | 80 | | |
| L-61 | SR | 400 | 510 | 31 | | 115 | 65 | |
| L-50M (LNS 133U) | AW | 470 | 570 | 28 | | 100 | | |
| L-50M (LNS 133U) | SR | 415 | 520 | 29 | | 140 | | 110 |
| LNS 140A (L-70) | AW | 460 | 560 | 26 | | 80 | | |
| LNS 164 | AW | 650 | 710 | 20 | 50 | | | |
| LNS 164 | SR | 590 | 670 | 24 | 100 | 65 | | |

* AW = As welded; SR = Stress relieved

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 2.4 |
| Solidification speed | Medium |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 2 - 20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| SRB BAG | 25.0 | FX839-25 |

8500

TOP FEATURES

- Capable of providing impact properties necessary for thick weld joints from root to cap pass
- Operates well on AC and multiple arcs with good resistance to nitrogen porosity
- Capable of producing weld deposits with impact properties exceeding 27 J at -62°C

CLASSIFICATION

| Flux | EN ISO 14174: S A FB 1 54 AC H5 | | |
|--------------------------|---------------------------------|--------------------|--------------------|
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 8500 / L-61 | S 38 4 FB S2Si | S 4T 0 FB S2Si | F7A6/F6P8-EM12K |
| 8500 / L-50M | S 42 6 FB S3Si | S 4T 2 FB S3Si | F7A6/F7P8-EH12K |
| 8500 / LNS 140A | S 42 4 FB S2Mo | | F8A6-EA2-A2 |
| 8500 / LNS 160 | S 42 5 FB S2Ni1* | | F7A8/P8-ENi1-Ni1 |
| 8500 / LNS 162 | S 42 6 FB S2Ni2* | | F7A8/P8-ENi2-Ni2 |
| 8500 / LNS 165 (LA85) | S 50 6 FB S3Ni1Mo0.2 | | F8A8/F7P8-ENi5-Ni5 |
| 8500 / LNS T55 | S 50 4 FB TZ | | |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo | Ni |
|------------------|------|-----|-----|--------|--------|-----|------|
| L-61 | 0.08 | 1.0 | 0.2 | <0.02 | <0.015 | | |
| L-50M (LNS 133U) | 0.07 | 1.4 | 0.3 | <0.02 | <0.015 | | |
| LNS 140A (L-70) | 0.08 | 0.9 | 0.2 | 0.03 | <0.025 | 0.4 | |
| LNS 160 | 0.07 | 1.0 | 0.1 | 0.02 | 0.015 | | 0.95 |
| LNS 162 | 0.08 | 1.0 | 0.1 | 0.02 | 0.015 | | 2.0 |
| LNS 165 (LA 85) | 0.07 | 1.3 | 0.2 | 0.02 | 0.015 | 0.2 | 0.9 |
| LNS T55 | 0.08 | 1.7 | 0.7 | <0.015 | <0.015 | | |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|------------------|------------|-------------------------|---------------------------|-------------------|------------------|-------|-------|
| | | | | | -20°C | -40°C | -60°C |
| L-61 | MR | 420 | 510 | 28 | 150 | 100 | 50 |
| L-50M (LNS 133U) | MR | 450 | 540 | 28 | | 110 | |
| L-50M (LNS 133U) | SR | >420 | >500 | 30 | | 150 | |
| LNS 140A (L-70) | MR | 440 | 540 | 28 | | 55 | |
| LNS 160 | AW | 430 | 510 | 30 | | 150 | 60 |
| LNS 160 | SR | 400 | 510 | 30 | | 150 | 90 |
| LNS 162 | AW | 470 | 560 | | | 150 | 70 |
| LNS 162 | SR | 450 | 530 | | | 150 | 100 |
| LNS 165 (LA 85) | AW | 530 | 600 | 25 | | 120 | 50 |
| LNS 165 (LA 85) | SR | 480 | 580 | 30 | | 120 | 60 |
| LNS T55 | AW | 530 | 620 | | 120 | 80 | |
| LNS T55 | SR | 500 | 570 | | | 70 | |

* MR = Multi-Run; TR = Two-Run; AW = As welded; SR = Stress relieved

8500

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 2.8 |
| Solidification speed | Medium |
| Density (kg/dm ³) | 1.3 |
| Grain size (EN ISO 14174) | 2 - 20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|--------------|
| SRB BAG | 25.0 | FX8500-25SRB |
| DRUM | 250.0 | FX8500-250 |

860

TOP FEATURES

- Industry standard for submerged arc welding applications
- Excellent operating characteristics in a variety of general welding applications.
- Capable of producing weld deposits with impact toughness exceeding 27 J at -40°C with L-61 wire

CLASSIFICATION

| Flux | EN ISO 14174: S A AB 1 56 AC H5 | | |
|----------------|---------------------------------|--------------------|-------------------|
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 860 / L-60 | S 35 2 AB S1 | | F6A2-EL12 |
| 860 / LNS 135 | S 35 2 AB S2 | S 3T 0 AB S2 | F6A2-EM12 |
| 860 / L-61 | S 38 2 AB S2Si | S 3T 0 AB S2Si | F7A2-EM12K |
| 860 / L-50M | S 42 2 AB S3Si | | F7A2/F7P2-EH12K |
| 860 / L-70 | S 46 2 AB S2Mo | S 4T 2 AB S2Mo | F7A2-EA1-A2 |
| 860 / LNS 140A | S 46 2 AB S2Mo | S 4T 2 AB S2Mo | F7A2-EA2-A2 |
| 860 / LNS 163 | S 42 2 AB S2Ni1Cu | | F7A4-EG-G |
| 860 / LNS T55 | S 50 2 AB TZ | | F7A2/F7P4-EC1 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|------------------|------|-----|------|--------|--------|-----|
| L-60 | 0.05 | 1.0 | 0.25 | <0.025 | <0.020 | |
| LNS 135 | 0.06 | 1.3 | 0.3 | <0.025 | <0.020 | |
| L-61 | 0.10 | 1.2 | 0.3 | <0.025 | <0.020 | |
| L-50M (LNS 133U) | 0.07 | 1.7 | 0.5 | <0.025 | <0.020 | |
| LNS 140A (L-70) | 0.05 | 1.3 | 0.3 | <0.025 | <0.020 | 0.4 |
| LNS T55 | 0.06 | 1.8 | 0.7 | <0.020 | <0.015 | |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|------------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | 0°C | -20°C |
| L-60 | AW | 360 | 480 | 30 | 80 | 50 |
| LNS 135 | AW | 390 | 490 | 33 | 100 | 50 |
| L-61 | AW | 430 | 510 | 32 | 100 | 60 |
| L-61 | SR | 400 | 505 | 32 | | 115 |
| L-50M (LNS 133U) | AW | 460 | 530 | 28 | 120 | 80 |
| L-50M (LNS 133U) | SR | 420 | 520 | | | 115 |
| LNS 140A (L-70) | AW | 520 | 570 | 26 | | 70 |
| LNS 140A (L-70) | SR | 510 | 580 | 30 | | 50 |
| LNS T55 | AW | 520 | 610 | | | 70 |
| LNS T55 | SR | 470 | 560 | | | 70 |
| LNS 163 | AW | 460 | 540 | 27 | | 55 |

* AW = As welded; SR = Stress relieved

860

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 1.1 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.4 |
| Grain size (EN ISO 14174) | 1 - 16 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| PE BAG | 25.0 | FX860-25 |
| SRB BAG | 25.0 | FX860-25SRB |
| DRUM | 250.0 | 111828 |

888

TOP FEATURES

- Designed for deep groove slag removal in critical applications
- Low H4 diffusible hydrogen levels

CLASSIFICATION

| Flux | EN ISO 14174: S A FB 1 66 AC H5 | |
|------------------|---------------------------------|--------------------|
| Flux/wire | EN ISO 14171-A: MR | AWS A5.17 / A5.23 |
| 888 / L-61 | S 38 5 FB S2Si | F7A6-EM12K |
| 888 / L-50M | S 42 6 FB S3Si | F7A8/F7P8-EH12K |
| 888 / LNS 140A | S 46 4 FB S2Mo | F8A4-EA2-A2 |
| 888 / L-70 | S 46 4 FB S2Mo | F8A4-EA1-A2 |
| 888 / LNS 160 | S 42 5 FB S2Ni1* | F7A8/P8-ENi1-Ni1 |
| 888 / LNS 162 | S 42 6 FB S2Ni2* | F7A8/F7P8-ENi2-Ni2 |
| 888 / LNS 164 | S 50 4 FB S3Ni1Mo | F9A6/F9P4-EF3-F3 |
| 888 / LNS 165 | S 50 4 FB S3Ni1Mo0.2 | F8A6/F7P8-ENi5-Ni5 |
| 888 / LNS 150 | S 50 2 FB CrMo1 | F7P4-EB2R-B2 |
| 888 / LNS 151 | | F8P4-EB3R-B3 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Ni | Mo | Cr |
|------------------|------|------|------|-------|--------|------|------|------|
| L-61 | 0.08 | 1.05 | 0.37 | <0.02 | <0.015 | | | |
| L-50M (LNS 133U) | 0.07 | 1.45 | 0.55 | <0.02 | <0.015 | | | |
| LNS 140A (L-70) | 0.07 | 1.0 | 0.35 | <0.02 | <0.015 | | 0.4 | |
| LNS 160 | 0.07 | 1.2 | 0.4 | <0.02 | <0.015 | 0.95 | | |
| LNS 162 | 0.07 | 1.1 | 0.4 | <0.02 | <0.015 | 2.0 | | |
| LNS 164 | 0.08 | 1.7 | 0.5 | <0.02 | <0.01 | 0.9 | 0.5 | |
| LNS 165 | 0.06 | 1.50 | 0.5 | <0.02 | <0.015 | 0.97 | 0.2 | |
| LNS 150 | 0.07 | 0.90 | 0.5 | <0.02 | <0.015 | | 0.55 | 1.35 |
| LNS 151 | 0.06 | 0.85 | 0.3 | <0.02 | <0.015 | | 0.93 | 2.15 |

888

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|-------|
| | | | | | -20°C | -40°C | -50°C | -60°C |
| L-61 | AW | 415 | 515 | 31 | | 35 | 100 | |
| L-50M (LNS 133U) | AW | 480 | 580 | 29 | | | 90 | 60 |
| L-50M (LNS 133U) | SR | 430 | 550 | 31 | | 105 | | 65 |
| LNS 160 | AW | 470 | 550 | 26 | | 115 | | |
| LNS 160 | SR | 410 | 510 | 27 | | 160 | | 120 |
| LNS 162 | AW | 500 | 580 | 25 | | 100 | | 55 |
| LNS 162 | SR | 440 | 550 | 25 | | 160 | | 120 |
| LNS 164 | AW | 650 | 750 | 21 | | 65 | | 30 |
| LNS 164 | SR | 610 | 700 | 23 | | 65 | | 30 |
| LNS 165 | AW | 530 | 620 | 26 | | 70 | | 40 |
| LNS 165 | SR | 495 | 595 | 27 | | | | 70 |
| LNS 150 | SR | 420 | 580 | 26 | 100 | | | |
| LNS 151 | SR | 530 | 645 | 23 | | 45 | | |

* AW = As welded; SR = Stress relieved

FLUX CHARACTERISTICS

| | |
|---------------------------|--------|
| Current type | AC/DC |
| Basicity (Boniszewski) | 2.3 |
| Solidification speed | High |
| Grain size (EN ISO 14174) | 2 - 20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| SRB BAG | 25.0 | FX888-25SRB |

960

TOP FEATURES

- Versatile flux
- High current carrying capacity
- For both single -run and multi-run techniques with moderate weld metal properties requirements
- Also available in coarse grain version

CLASSIFICATION

| | | | |
|------------------|---------------------------------|--------------------|-------------------|
| Flux | EN ISO 14174: S A AB 1 66 AC H5 | | |
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| 960 / L-61 | S 38 2 AB S2Si | S 3T 2 AB S2Si | F7A2-EM12K |
| 960 / L-50M | S 38 2 AB S3Si | S 3T 2 AB S3Si | F7A2-EH12K |
| 960 / LNS 163 | S 42 4 AB S2Ni1Cu | | F7A4-EG-G |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Cu | Ni |
|------------------|------|-----|------|-------|--------|-----|-----|
| L-61 | 0.07 | 1.3 | 0.4 | <0.03 | <0.025 | | |
| L-50M (LNS 133U) | 0.07 | 1.6 | 0.6 | <0.03 | <0.025 | | |
| 960 / LNS 163 | 0.06 | 1.4 | 0.35 | <0.03 | <0.025 | 0.4 | 0.6 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | |
|------------------|------------|----------------------|------------------------|----------------|------------------|-------|
| | | | | | -20°C | -40°C |
| L-61 | AW | 420 | 510 | 28 | 50 | |
| L-50M (LNS 133U) | AW | 440 | 530 | 28 | 70 | |
| LNS 163 | AW | 460 | 540 | 27 | | 55 |

* AW = As welded

FLUX CHARACTERISTICS

| | |
|-------------------------------|-------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 1.0 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.4 |
| Grain size (EN ISO 14174) | 2-20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| PE BAG | 25.0 | FX960-25 |
| SRB BAG | 25.0 | FX960-25SRB |
| DRUM | 250.0 | 111835 |
| BIG BAG | 1000.0 | FX960-1T |

995N

TOP FEATURES

- A nitrogen limiting flux designed for seam welding of pipes
- Recommended for automatic single pass/2-run welding with up to five arcs
- Very high current capacity

CLASSIFICATION

| | | |
|------------------|---------------------------------|---------------|
| Flux | EN ISO 14174: S A AB 1 67 AC H5 | |
| Flux/wire | EN ISO 14171-A: TR | AWS A5.23 |
| 995N / LNS 140A | S 4T 2 AB S2Mo | |
| 995N / LNS 140TB | S 5T 5 AB S2MoTiB | F9TA6G-EA2TiB |
| 995N / LNS 133TB | | F9TA6G-EG |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | Base material | C | Mn | Si | P | S | Mo | Ti | B | N |
|-------------------|---------------|------|------|------|--------|--------|-----|-------|-------|-------|
| LNS 140A (L-70) | X65 | 0.07 | 1.45 | 0.3 | <0.025 | <0.025 | 0.2 | - | - | 0.005 |
| LNS 140TB (LA-81) | X80 | 0.06 | 1.6 | 0.35 | <0.025 | <0.025 | 0.2 | 0.015 | 0.002 | 0.004 |

Remark: the chemical composition from butt welds in pipe depends on the chemical composition of base material.
 Procd: tandem AC/AC application on X65 plate 12.7 mm thick.

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | | Hardness |
|-------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|-------|----------|
| | | | | | -20°C | -40°C | -50°C | -60°C | |
| Procedure 1 | | | | | | | | | |
| LNS 140A (L-70) | TR | 580 | 680 | 30 | 95 | 65 | | | 230 |
| LNS 140TB (LA-81) | TR | 630 | 700 | 27 | 115 | 75 | 50 | | 235 |
| Procedure 2 | | | | | | | | | |
| LNS 140TB (LA-81) | TR | 600 | 720 | 25 | 100 | 65 | | 45 | 220-235 |
| Procedure 3 | | | | | | | | | |
| LNS 133TB | TR | 600 | 700 | 27 | | 120 | | 90 | |

Remark: the mechanical properties from butt welds in pipe depends on the chemical composition of base material.
 Procedure 1: tandem in 12.5mm X65; Procedure 2: multiwire weld (4/5 wires) in 19-25mm X65; Procedure 3: AWS test plate

* TR = Two-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 1.3 |
| Solidification speed | Medium |
| Density (kg/dm ³) | 1.0 |
| Grain size (EN ISO 14174) | 2 - 20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-------------|-------------|--------------|
| PE BAG | 25.0 | 111218 |
| SRB BAG | 25.0 | 111220 |
| SRB BIG BAG | 1000.0 | FX995N-1TSRB |
| BIG BAG | 1200.0 | 111712 |

998N

TOP FEATURES

- Suitable for both seam and spiral pipe welds
- Recommended for automatic single pass/2-run welding with up to five arcs
- Very high current capacity

CLASSIFICATION

| | | |
|------------------|---------------------------------|----------------|
| Flux | EN ISO 14174: S A AB 1 67 AC H5 | |
| Flux/wire | EN ISO 14171-A: TR | AWS A5.23 |
| 998N / LNS 140A | S 4T 2 AB S2Mo | |
| 998N / LNS140TB | S 5T 5 AB S2MoTiB | F9TA6-G-EA2TiB |
| 998N / LNS133TB | | F9TA6-G-EG |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | Base material | C | Mn | Si | P | S | Mo | Ti | B | N |
|-------------------|---------------|---------------|-------------|-------------|---------------|---------------|-------------|---------------|-----------------|---------------|
| LNS 140TB (LA-81) | X65 | 0.067 / 0.076 | 1.41 / 1.51 | 0.28 / 0.34 | 0.017 / 0.020 | 0.003 / 0.004 | 0.22 / 0.27 | 0.024 / 0.034 | 0.0028 / 0.0036 | 0.005 / 0.01 |
| LNS 140TB (LA-81) | X80 | 0.045 / 0.06 | 1.6 / 1.64 | 0.35 / 0.4 | 0.016 / 0.017 | 0.004 / 0.005 | 0.3 / 0.35 | 0.031 / 0.034 | 0.0029 / 0.0032 | 0.005 / 0.006 |

Remark: the chemical composition from butt welds in pipe depends on the chemical composition of base material.
 Proced1: triple arc application on X65 plate 15.9 mm thick; Proced2: tandem applications on X80 plate 12.7mm thick.

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | | Hardness |
|-------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|-------|----------|
| | | | | | -20°C | -40°C | -50°C | -60°C | |
| Procedure 1 | | | | | | | | | |
| LNS 140A (L-70) | AW | 570 | 680 | 27 | | | | | 230 |
| LNS 140TB (LA-81) | AW | 610 | 700 | 27 | 115 | 75 | 50 | | 235 |
| Procedure 2 | | | | | | | | | |
| LNS 140TB (LA-81) | AW | 640 | 730 | 24 | 160 | 120 | 90 | 70 | 220-235 |
| Procedure 3 | | | | | | | | | |
| LNS 133TB | TR | 610 | 730 | 26 | | | 120 | 80 | |

Remark: the mechanical properties from butt welds in pipe depends on the chemical composition of base material.
 Procedure 1: tandem in 12.5mm X65; Procedure 2: multiwire weld (4/5 wires) in 19-25mm X65; Procedure 3: AWS test plate

* AW = As welded; TR = Two-Run

998N

FLUX CHARACTERISTICS

| | |
|-------------------------------|-------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 1.3 |
| Solidification speed | Fast |
| Density (kg/dm ³) | 1.3 |
| Grain size (EN ISO 14174) | 2 -20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| PE BAG | 25.0 | 112047 |
| SRB BAG | 25.0 | 112054 |
| BIG BAG | 1000.0 | 112061 |

P223

TOP FEATURES

- Excellent choice for Spiral mills application
- Compatible with a large range of pipe diameters
- Up to 3 arcs configuration

CLASSIFICATION

| | | |
|------------------|---------------------------------|-------------------|
| Flux | EN ISO 14174: S A AB 1 67 AC H5 | |
| Flux/wire | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| P223 / L-61 | S 4T 2 AB S2Si | F7A4-EM12K |
| P223 / L-50M | S 4T 2 AB S3Si | F7A5-EH12K |
| P223 / LNS 140A | S 4T 4 AB S2Mo | F8A4-EA2-A2 |
| P223 / LNS 133TB | | F8TA4G-EG |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|------------------|------|-----|-----|-------|--------|-----|
| L-61 | 0.08 | 1.4 | 0.2 | <0.02 | <0.015 | |
| L-50M (LNS 133U) | 0.07 | 1.7 | 0.3 | <0.02 | <0.015 | |
| LNS 140A (L-70) | 0.08 | 1.4 | 0.2 | 0.03 | <0.025 | 0.4 |

Remark: the chemical composition from butt welds in pipe depends on the chemical composition of base material.

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Impact ISO-V (J) | |
|------------------|------------|----------------------|------------------------|------------------|--------|
| | | | | -20 °C | -40 °C |
| L-61 | TR | 450 | 550 | 60 | |
| L-50M (LNS 133U) | TR | 470 | 570 | 80 | |
| LNS 140A (L-70) | TR | 500 | 600 | | 50 |
| LNS 133TB | TR | 510 | 610 | | 60 |

* TR = Two-Run

FLUX CHARACTERISTICS

| | |
|-------------------------------|-------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 1.6 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 2 -20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|--------------|
| PE BAG | 25.0 | 110364 |
| SRB BAG | 25.0 | FXP223-25SRB |

P230

TOP FEATURES

- Versatile and robust flux behavior
- Low hydrogen content
- Good impact values in two run and multirun technique with the related wire chemistry

CLASSIFICATION

| Flux | EN ISO 14174: S A AB 1 67 AC H5 | | |
|-----------------|---------------------------------|--------------------|--------------------|
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| P230 / LNS 135 | S 38 4 AB S2 | S 4T 2 AB S2 | F7A4/F7P6-EM12 |
| P230 / L-61 | S 38 4 AB S2Si | | F7A4/F6P5-EM12K |
| P230 / L-50M | S 46 5 AB S3Si | | F7A5/F7P5-EH12K |
| P230 / LNS 140A | S 46 4 AB S2Mo | S 4T 4 AB S2Mo | F8A4-EA2-G |
| P230 / L-70 | S 46 4 AB S2Mo | S 4T 4 AB S2Mo | F8A4-EA1-G |
| P230 / LNS 160 | S 46 4 AB S2Ni1* | | F7A8/F7P8-ENi1-Ni1 |
| P230 / LNS 162 | S 46 6 AB S2Ni2* | | F7A8/F7P8-ENi2-Ni2 |
| P230 / LNS T55 | S50 4 AB Tz | | F7A4/F7P5-EC1 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo | Ni |
|------------------|------|-----|------|-------|-------|-----|-----|
| L-61 | 0.06 | 1.4 | 0.4 | <0.03 | <0.02 | | |
| LNS 135 | 0.07 | 1.4 | 0.25 | <0.03 | <0.02 | | |
| L-50M (LNS 133U) | 0.08 | 1.7 | 0.5 | <0.03 | <0.02 | | |
| LNS 140A (L-70) | 0.07 | 1.4 | 0.3 | <0.03 | <0.02 | 0.5 | |
| LNS 160 | 0.07 | 1.4 | 0.3 | <0.03 | <0.02 | | 0.9 |
| LNS 162 | 0.08 | 1.2 | 0.3 | <0.03 | <0.02 | | 2.0 |
| LNS T55 | 0.07 | 1.8 | 0.8 | 0.02 | 0.015 | | |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|
| | | | | | -20°C | -40°C | -60°C |
| LNS 135 | AW | 400 | 500 | 30 | 50 | | |
| L-61 | AW | 450 | 520 | 30 | 100 | | |
| L-61 | SR | 400 | 490 | 30 | 140 | 80 | |
| L-50M (LNS 133U) | AW | 480 | 580 | 30 | | 80 | |
| L-50M (LNS 133U) | SR | 460 | 540 | 28 | | 70 | |
| LNS 140A (L-70) | MR | 540 | 620 | 28 | 70 | | |
| LNS 140A (L-70) | TR | | 620 | | | 60 | |
| LNS 160 | AW | 490 | 570 | 28 | | 120 | 45 |
| LNS 160 | SR | 430 | 550 | 28 | | 140 | 75 |
| LNS 162 | AW | 500 | 590 | 28 | | 120 | 50 |
| LNS 162 | SR | 460 | 570 | 28 | | 150 | 80 |
| LNS T55 | AW | 540 | 630 | 28 | 90 | 60 | |
| LNS T55 | SR | 520 | 610 | 28 | 80 | 50 | |

* MR = Multi-Run; TR = Two-Run; AW = As welded; SR = Stress relieved

P230

FLUX CHARACTERISTICS

| | |
|-------------------------------|-------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 1.6 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 2 -20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|--------------|
| SRB BAG | 25.0 | FXP230-25SRB |

P240

TOP FEATURES

- Excellent impact toughness properties
- Low carbon burn-off
- Recommended with Long stick-out process

CLASSIFICATION

| Flux | EN ISO 14174: S A FB 1 55 AC H5 | |
|---------------------------|---------------------------------|--------------------|
| Flux/wire | EN ISO 14171-A: MR | AWS A5.17 / A5.23 |
| P240 / L-61 | S 42 4 FB S2Si | F7A6-EM12K |
| P240 / L-50M | S 46 6 FB S3Si | F7A8/P8-EH12K |
| P240 / LNS 160 | S 46 6 FB S2Ni1* | F7A10/P10-ENi1-Ni1 |
| P240 / LNS 162 | S 46 6 FB S2Ni2* | F7A10/P10-ENi2-Ni2 |
| P240 / LNS 165 (LA-85) | S 50 6 FB S3Ni1Mo0.2 | F8A8/P8-ENi5-Ni5 |
| P240 / LNS 168 | S 69 4 FB S3NiCr2.5Mo | F10A5-EM2-M2 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo | Ni | Cr |
|------------------|------|-----|------|---------|---------|------|-----|-----|
| L-61 | 0.08 | 1.0 | 0.35 | < 0.010 | < 0.010 | | | |
| L-50M (LNS 133U) | 0.08 | 1.6 | 0.35 | < 0.020 | < 0.015 | | | |
| LNS 160 | 0.08 | 1.0 | 0.25 | < 0.020 | < 0.015 | | 0.9 | |
| LNS 162 | 0.08 | 1.0 | 0.25 | < 0.020 | < 0.015 | | 2.0 | |
| LNS 165 | 0.08 | 1.3 | 0.35 | < 0.020 | < 0.015 | 0.15 | 0.9 | |
| LNS 168 | 0.08 | 1.5 | 0.4 | < 0.015 | < 0.015 | 0.4 | 2.4 | 0.3 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|------------------|------------|----------------------|------------------------|----------------|------------------|-------|-------|-------|
| | | | | | -20°C | -40°C | -50°C | -60°C |
| L-61 | AW | 440 | 530 | 30 | 115 | 75 | | |
| L-50M (LNS 133U) | AW | 460 | 560 | 28 | | | | 0 |
| L-50M (LNS 133U) | SR | 420 | 540 | 28 | | | | 40 |
| LNS 160 | AW | 470 | 550 | 28 | | | | 80 |
| LNS 160 | SR | 430 | 490 | 32 | | | | 100 |
| LNS 162 | AW | 480 | 560 | 26 | | | | 100 |
| LNS 162 | SR | 460 | 530 | 30 | | | | 140 |
| LNS 165 | AW | 520 | 600 | 25 | | | | 60 |
| LNS 165 | SR | 510 | 580 | 24 | | | | 60 |
| LNS 168 | AW | 720 | 800 | 20 | | | 55 | |

* AW = As welded; SR = Stress relieved

P240

FLUX CHARACTERISTICS

| | |
|-------------------------------|--------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 3.0 |
| Density (kg/dm ³) | 1.1 |
| Grain size (EN ISO 14174) | 1 - 16 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|--------------|
| SRB BAG | 25.0 | FXP240-25SRB |

P240X

TOP FEATURES

- Excellent impact toughness properties
- Low carbon burn-off
- Recommended with Long stick-out process
- Suitable in multi-wire (tandem, triple arc), conventional and Long Stick Out applications
- Recommended for PWHT assembly

CLASSIFICATION

| Flux | EN ISO 14174: S A FB 1 55 AC H5 | |
|----------------------------|---------------------------------|--------------------|
| Flux/wire | EN ISO 14171-A: MR | AWS A5.17 / A5.23 |
| P240X / L-61 | S 42 4 FB S2Si | F7A6-EM12K |
| P240X / L-50M | S 46 6 FB S3Si | F7A8/P8-EH12K |
| P240X / LNS 150 | S 50 4 FB S2CrMo1 | F8P4-EB2R-B2 |
| P240X / LNS 162 | S 46 6 FB S2Ni2* | F7A10/P10-ENi2-Ni2 |
| P240X / LNS164(LA-84) | S 50 6 FB S3Ni1Mo | F9A8/P8-EF3-F3 |
| P240X / LNS 165 (LA-85) | S 50 6 FB S3Ni1Mo0.2 | F8A8/P8-ENi5-Ni5 |
| P240X / LNS 168 | S 69 4 FB S3NiCr2.5Mo | F10A5-EM2-M2 |

* Nearest classification

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Ni | Mo | Cr |
|------------------|------|-----|------|---------|---------|-----|-----|-----|
| L-61 | 0.08 | 1.0 | 0.35 | < 0.010 | < 0.010 | | | |
| L-50M (LNS 133U) | 0.08 | 1.6 | 0.35 | < 0.020 | < 0.015 | | | |
| LNS150 | 0.13 | 0.8 | 0.15 | < 0.010 | < 0.010 | | 0.5 | 1.2 |
| LNS 162 | 0.08 | 1.0 | 0.25 | < 0.020 | < 0.015 | 2.2 | | |
| LNS164 | 0.08 | 1.7 | 0.1 | < 0.020 | < 0.015 | 0.9 | 0.5 | |
| LNS 165 | 0.08 | 1.4 | 0.2 | < 0.020 | < 0.015 | 1 | 0.2 | |
| LNS 168 | 0.1 | 0.6 | 0.15 | < 0.015 | < 0.015 | 2.3 | 0.6 | 0.7 |

P240X

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|------------------|--------------------------|----------------------|------------------------|----------------|------------------|-------|-------|-------|
| | | | | | -29°C | -40°C | -50°C | -60°C |
| L-61 | AW / DC+ | 460 | 520 | 35 | | 200 | | 90 |
| L-61 | SR / DC+ | 410 | 500 | 34 | | 187 | | 180 |
| L-61 | AW / AC / Long Stick Out | 500 | 560 | 32 | | 145 | | 100 |
| L-61 | SR / AC / Long Stick Out | 430 | 530 | 34 | | 164 | | 150 |
| L-50M (LNS 133U) | AW / DC+ | 500 | 575 | 33 | | 214 | | 190 |
| L-50M (LNS 133U) | SR / DC+ | 420 | 520 | 37 | | | 210 | 175 |
| L-50M (LNS 133U) | AW / AC / Long Stick Out | 570 | 630 | 31 | | 196 | | 150 |
| L-50M (LNS 133U) | SR / AC / Long Stick Out | 480 | 560 | 35 | | 192 | | 160 |
| LNS150 | SR / DC+ | 540 | 610 | 29 | | | 47 | |
| LNS150 | SR / AC / Long Stick Out | 550 | 640 | 23 | 140 | | 31 | |
| LNS 162 | AW / DC+ | 500 | 570 | 32 | | 190 | | 150 |
| LNS 162 | SR / DC+ | 440 | 530 | 36 | | 240 | | 190 |
| LNS 162 | AW / AC / Long Stick Out | 530 | 600 | 31 | | 210 | | 180 |
| LNS 162 | SR / AC / Long Stick Out | 470 | 560 | 33 | | 230 | | 190 |
| LNS164 | AW / DC+ | 630 | 680 | 29 | | 110 | | 80 |
| LNS164 | SR / DC+ | 600 | 660 | 28 | | 170 | | 80 |
| LNS164 | AW / AC / Long Stick Out | 660 | 730 | 27 | | 190 | | 150 |
| LNS164 | SR / AC / Long Stick Out | 640 | 700 | 28 | | 220 | | 180 |
| LNS 165 | AW / DC+ | 520 | 600 | 25 | | | | 60 |
| LNS 165 | SR / DC+ | 510 | 580 | 24 | | | | 60 |
| LNS 168 | AW | 720 | 800 | 20 | | | 55 | |

* AW = As welded; SR = Stress relieved

590°C/1h for the L61 wire

620°C/1h for the L50M/LNS162/LNS164 and LNS165

690°C/1h for the LNS150

FLUX CHARACTERISTICS

| | |
|-------------------------------|-------|
| Current type | DC/AC |
| Basicity (Boniszewski) | 3.0 |
| Grain size (EN ISO 14174) | 1-16 |
| Density (kg/dm ³) | 1.1 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| SRB BAG | 25.0 | 111040 |
| DRUM | 200.0 | 112276 |

WTX

TOP FEATURES

- Excellent bead profile
- High current carrying capacity
- Designed for onshore windtower fabrication
- Mainly used with L61 and L70 wires

CLASSIFICATION

| | | | |
|------------------|---------------------------------|--------------------|-------------------|
| Flux | EN ISO 14174: S A AB 1 57 AC H5 | | |
| Flux/wire | EN ISO 14171-A: MR | EN ISO 14171-A: TR | AWS A5.17 / A5.23 |
| WTX™/ L-61 | S 42 4 AB S2Si | | F7A8-EM12K |
| WTX™/L-61 (SR) | S 38 5 AB S2Si | | F6P8-EM12K |
| WTX™/ LNS 140A | S 50 2 AB S2Mo | S 5T 4 AB S2Mo | F8A4-EA2-A2 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | P | S | Mo |
|------------|------|------|------|------|------|------|
| L-61 | 0.06 | 1.63 | 0.25 | 0.02 | 0.01 | - |
| LNS 140A | 0.05 | 1.39 | 0.17 | 0.02 | 0.01 | 0.45 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|------------|------------------|----------------------|------------------------|----------------|------------------|-------|-------|
| | | | | | -20°C | -40°C | -60°C |
| L-61 | AW-MR | 445 | 525 | 31 | 150 | | 35 |
| L-61 | SR 620°C/1h - MR | 395 | 490 | 35 | 150 | | |
| LNS 140A | AW-MR | 530 | 595 | 24 | 60 | | |
| LNS 140A | AW-TR | 575 | 640 | 24 | | 75 | |

* MR = Multi-Run; TR = Two-Run; AW = As welded; SR = Stress relieved

FLUX CHARACTERISTICS

| | |
|-------------------------------|------|
| Basicity (Boniszewski) | 1.4 |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 2-20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|-------------|
| SRB BAG | 25.0 | FXWTX-25SRB |

P2000

TOP FEATURES

- Excellent slag detachability
- Recommended for duplex and stabilized grades
- Moisture resistant packaging

CLASSIFICATION

| Flux | EN ISO 14174: S A AF2 5643 DC H5 | |
|-------------------|----------------------------------|-------------------|
| Wire | EN ISO 14343-A | AWS A5.9/A5.9M |
| LNS 304L | S 19 9 L | ER308L |
| LNS 309L | S 23 12 L | ER309L |
| LNS 316L | S 19 12 3 L | ER316L |
| LNS 4462 | S 22 9 3 N L | ER2209 |
| LNS 318 | S 19 12 3 Nb | ER318 |
| LNS 347 | S 19 9 Nb | ER347 |
| LNS Zeron® 100X | S 25 9 4 N L | ER2594 |
| LNS 4455 | S 20 16 3 Mn L | ER316LMn |
| LNS 4500 | S 20 25 5 Cu L | ER385 |
| LNS 304H | S 19 9 H | ER308H |
| LNS 307 | S 18 8 Mn | ER307* |
| Wire | EN ISO 18274 | AWS A5.14/ A5.14M |
| LNS NiCro 60/20 | S Ni 6625 | ERNiCrMo-3 |
| LNS NiCroMo 60/16 | S Ni 6276 | ERNiCrMo-4 |
| LNS NiCro 70/19 | S Ni 6082 | ERNiCr-3 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | Cr | Ni | Mo | N | Nb | Cu | W | FN |
|-----------------|-------|-----|-----|------|------|-----|------|-----|-----|-----|-------|
| LNS 304L | 0.015 | 1.5 | 0.5 | 19 | 10 | | | | | | 08-10 |
| LNS 309L | 0.015 | 1.5 | 0.5 | 23 | 13 | | | | | | 10-20 |
| LNS 316L | 0.015 | 1.5 | 0.5 | 18 | 12 | 2.5 | | | | | 08-10 |
| LNS 4462 | 0.015 | 1.5 | 0.5 | 22 | 8 | 3.0 | 0.1 | | | | 40-60 |
| LNS 318 | 0.04 | 1.5 | 0.5 | 19 | 11 | 2.5 | | 0.5 | | | 08-10 |
| LNS 347 | 0.03 | 1.4 | 0.5 | 19 | 10 | | | 0.6 | | | 08-10 |
| LNS Zeron® 100X | 0.03 | 0.6 | 0.5 | 25 | 9.5 | 3.6 | 0.2 | | 0.7 | 0.6 | 30-60 |
| LNS NiCro 60/20 | 0.006 | 0.1 | 0.4 | 21.5 | 64.5 | 8.7 | | 3.8 | | | |
| LNS 4455 | 0.025 | 6 | 0.5 | 18.5 | 15 | 2.6 | 0.15 | | | | |
| LNS 4500 | 0.03 | 1.5 | 0.6 | 19 | 25 | 4.1 | | | 1.2 | | |

P2000

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | | |
|-----------------|------------|----------------------|------------------------|----------------|------------------|--------|--------|---------|
| | | | | | 20 °C | -20 °C | -40 °C | -196 °C |
| LNS 304L | AW | 380 | 550 | 35 | | 80 | | |
| LNS 309L | AW | 425 | 580 | 33 | | | 80 | |
| LNS 316L | AW | 425 | 560 | 33 | | | | 50 |
| LNS 4462 | AW | 550 | 800 | 27 | | | 50 | |
| LNS Zeron® 100X | AW | 670 | 880 | 21 | | 70 | 45 | |
| LNS NiCro 60/20 | AW | 520 | 780 | 40 | | | | 100 |
| LNS 347 | AW | 470 | 620 | 30 | 90 | | | 35 |
| LNS 4455 | AW | 360 | 640 | 30 | | | | |

* AW = As welded

FLUX CHARACTERISTICS

| | |
|-------------------------------|-------|
| Current type | DC+/- |
| Basicity (Boniszewski) | 1.6 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 2 -20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|---------------|
| SRB BAG | 25.0 | FXP2000-25SRB |

P2000S

TOP FEATURES

- Chromium compensating stainless steel flux
- Recommended for dissimilar welding
- Moisture resistant packaging

CLASSIFICATION

| | | |
|-----------------|----------------------------------|----------------|
| Flux | EN ISO 14174: S A AF2 7681 DC H5 | |
| Wire | EN ISO 14343-A | AWS A.59/A5.9M |
| LNS 309L | S 24 12 L | ER309L |
| LNS 4462 | S 22 9 3 N L | ER2209 |
| LNS Zeron® 100X | S 25 9 4 N L | ER2594 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | Cr | Ni | Mo | N | Cu | W | FN |
|-----------------|-------|-----|-----|----|----|-----|-----|-----|-----|-------|
| LNS 309L | 0.015 | 1.5 | 0.5 | 25 | 13 | | | | | 15-20 |
| LNS 4462 | 0.015 | 1.5 | 0.5 | 24 | 8 | 3.0 | 0.1 | | | 40-60 |
| LNS Zeron® 100X | 0.02 | 0.5 | 0.4 | 26 | 9 | 3.7 | 0.2 | 0.7 | 0.6 | 30-60 |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) -40°C |
|-----------------|----------------------|------------------------|----------------|------------------------|
| LNS 309L | 450 | 600 | 33 | 80 |
| LNS 4462 | 700 | 850 | 27 | 50 |
| LNS Zeron® 100X | 670 | 880 | 25 | 45 |

FLUX CHARACTERISTICS

| | |
|-------------------------------|---------|
| Current type | DC(+/-) |
| Basicity (Boniszewski) | 1.6 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 1-16 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|----------------|
| SRB BAG | 25.0 | FXP2000S-25SRB |

P2007

TOP FEATURES

- Recommended for all stainless steels grades except duplex and stabilized grades
- Recommended for 2G welding application
- Operates on AC

CLASSIFICATION

| Flux | EN ISO 14174: S A AF2 5643 AC H5 | |
|-------------------|----------------------------------|-------------------|
| Wire | EN ISO 14343-A | AWS A5.9/A5.9M |
| LNS 304L | S 19 9 L | ER308L |
| LNS 309L | S 24 12 L | ER309L |
| LNS 316L | S 19 12 3 L | ER316L |
| LNS 4455 | S 20 16 3 Mn L | ER316LMn |
| LNS 4500 | S 20 25 5 Cu L | ER385 |
| LNS 304H | S 19 9 H | ER308H |
| LNS 307 | S 18 8 Mn | ER307* |
| Wire | EN ISO 18274 | AWS A5.14/ A5.14M |
| LNS NiCro 60/20 | S Ni 6625 | ERNiCrMo-3 |
| LNS NiCroMo 60/16 | S Ni 6276 | ERNiCrMo-4 |
| LNS NiCro 70/19 | S Ni 6082 | ERNiCr-3 |

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

| Wire grade | C | Mn | Si | Cr | Ni | Mo | N | Nb | Cu | W | FN |
|-------------------|-------|-----|-----|------|------|------|------|-----|-----|-----|-------|
| LNS 304L | 0.015 | 1.5 | 0.5 | 19 | 10 | | | | | | 08-10 |
| LNS 309L | 0.015 | 1.5 | 0.5 | 23 | 13 | | | | | | 10-20 |
| LNS 316L | 0.015 | 1.5 | 0.5 | 18 | 12 | 2.5 | | | | | 08-10 |
| LNS NiCro 60/20 | 0.006 | 0.1 | 0.4 | 21.5 | 64.5 | 8.7 | | 3.8 | | | |
| LNS NiCroMo 60/16 | 0.01 | 0.4 | 0.2 | 15 | 57.5 | 15.6 | | | | 3.2 | |
| LNS 4455 | 0.025 | 6 | 0.5 | 18.5 | 15 | 2.6 | 0.15 | | | | |
| LNS 4500 | 0.03 | 1.5 | 0.6 | 19 | 25 | 4.1 | | | 1.2 | | |

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

| Wire grade | Condition* | Yield strength (MPa) | Tensile strength (MPa) | Elongation (%) | Impact ISO-V (J) | | |
|-------------------|------------|----------------------|------------------------|----------------|------------------|--------|---------|
| | | | | | -20 °C | -40 °C | -196 °C |
| LNS 304L | AW | 390 | 550 | 35 | 80 | 75 | 40 |
| LNS 309L | AW | 400 | 580 | 33 | | 70 | |
| LNS 316L | AW | 400 | 560 | 33 | 75 | 70 | 45 |
| LNS NiCro 60/20 | AW | 520 | 780 | 40 | | | 100 |
| LNS NiCroMo 60/16 | AW | 470 | 730 | 43 | | | 80** |

* AW = As welded

** Lateral expansion: 0.95 mm in AC polarity

P2007

FLUX CHARACTERISTICS

| | |
|-------------------------------|---------|
| Current type | DC(+/-) |
| Basicity (Boniszewski) | 1.6 |
| Solidification speed | High |
| Density (kg/dm ³) | 1.2 |
| Grain size (EN ISO 14174) | 2 -20 |

PACKAGING AND AVAILABLE SIZES

| Packaging | Weight (kg) | Item number |
|-----------|-------------|---------------|
| SRB BAG | 25.0 | FXP2007-25SRB |

BENEFITS

For a well-made welding bead:

- Without copper contamination
- Without risk of burn through in the first pass position (used as a support)
- Without re-welding
- Without risk of lack of fusion
- No turning of the work piece
- Bigger root thickness permits higher welding current for the hot pass
- An increase in first pass deposit rate
- Wide root gap
- Total penetration without turning the parts to be welded
- Total penetration of joints difficult to access in reverse position
- Smooth profile of the root pass

For a well-made weld preparation before welding:

- Ideal to compensate for variations in preparation of sheet edge backlashes
- Easy to use (adhesive/metallic support)
- Simplify chamfering preparations

For higher productivity:

- Without gouging operation
- Without grinding operation
- Provides time saving and high quality
- Easy-to-use slats technique

KERALINE has a very low moisture absorption rate and a high melting point, allowing use at high welding intensity, up to 600A.





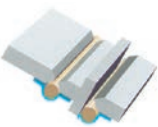





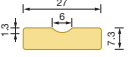


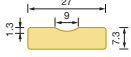
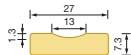
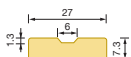
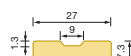

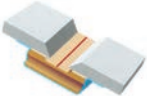

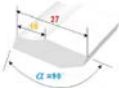











The selection of KERALINE slat types for different welding processes

| | MMA | TIG | MIG/MAG | SAW | | MMA | TIG | MIG/MAG | SAW |
|---------------|-----|-----|---------|-----|---------------|-----|-----|---------|-----|
| KERALINE TA 1 | - | ✓ | ✓ | - | KERALINE TR 2 | ✓ | - | ✓ | - |
| KERALINE TA 2 | - | ✓ | ✓ | - | KERALINE TR 3 | ✓ | - | ✓ | - |
| KERALINE TA 3 | ✓ | - | ✓ | - | KERALINE TR 4 | ✓ | - | ✓ | - |
| KERALINE TF 1 | - | ✓ | ✓ | - | KERALINE TR 5 | ✓ | - | ✓ | - |
| KERALINE TF 2 | - | ✓ | ✓ | - | KERALINE TR 6 | ✓ | - | ✓ | - |
| KERALINE TF 3 | ✓ | - | ✓ | - | KERALINE TM 1 | ✓ | ✓ | ✓ | ✓ |
| KERALINE TR 1 | ✓ | - | ✓ | - | KERALINE TM 2 | ✓ | ✓ | ✓ | ✓ |

The selection of KERALINE slat types for different supports, shapes and dimensions

| | Type | Item number | Dimensions (mm) | 3D diagram | Application | Packing |
|-----------------------------|--------------------|-------------|-----------------|------------|-------------|--|
| Ceramic-on-metallic support | KERALINE TM1-13 mm | W000010403 | | | | 600 mm / piece 10 pieces per bag (6 meters) 7 bags/carton (42 meters) |
| | KERALINE TM2-18 mm | W000010404 | | | | 600 mm / piece 9 pieces per bag (5.4 meters) 5 bags/carton (27 meters) |

Ceramic-on-aluminium tape

| Type | Item number | Dimensions (mm) | 3D diagram | Application | Packing |
|----------------------------------|-------------|--|---|---|---|
| KERALINE TR1-6 mm | W000010397 |  Ø 6 |  |  | 600 mm / piece 50 pieces per bag (30 meters) 5 bags/carton (150 meters) |
| KERALINE TR2-7 mm | W000010398 |  Ø 7 | | | |
| KERALINE TR3-8 mm | W000010399 |  Ø 8 | | | |
| KERALINE TR4-9 mm | W000010400 |  Ø 9 | | | |
| KERALINE TR5-12 mm | W000010401 |  Ø 12 | | | |
| KERALINE TR6-15 mm | W000010402 |  Ø 15 | | | 600 mm / piece 15 pieces per bag (9 meters) 5 bags/carton (45 meters) |
| KERALINE TA1-6 mm | W000010391 |  |  |  | 600 mm / piece 10 pieces per bag (6 meters) 6 bags/carton (36 meters) |
| KERALINE TA2-9 mm | W000010392 |  | | | |
| KERALINE TA3-13 mm | W000010393 |  | | | |
| KERALINE TF1-6 mm | W000010394 |  | | | |
| KERALINE TF2-9 mm | W000010395 |  |  |  | 600 mm / piece 10 pieces per bag (6 meters) 6 bags/carton (36 meters) |
| KERALINE TF3-13 mm | W000010396 |  | | | |
| KERALINE TJ10 T FULL PENETRATION | W000262368 |  |  |  | 600 mm / piece 10 pieces per bag (6 meters) 6 bags/carton (36 meters) |
| SET OF CERAMIC BACKING RAD 150 | W000275493 |  |  |  | 16 pieces /Circle 18 Circles/carton (18 meters) |
| SET OF CERAMIC BACKING RAD 200 | W000275532 |  |  |  | 4 pieces/Segment 20 Segments / SET 12 Sets/carton (12 meters) |
| SET OF CERAMIC BACKING RAD 100 | W000404095 |  |  |  | 12 pieces /Circle 22 Circles/carton (22 meters) |

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Handwriting practice area consisting of multiple horizontal dotted lines for writing.

Dotted lines for notes.

Handwriting practice area consisting of 20 horizontal dotted lines.



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