



SUPRAMIG HD® Ø 1.32 MM HIGH PRODUCTIVITY GMAW SOLUTION

www.lincolnelectriceurope.com

LINCOLN[®]
ELECTRIC

HIGH PRODUCTIVITY SOLUTION



SUPRAMIG®
HD + Ø 1.32 mm



**ENGINEERED
SURFACE
CONDITION
PREMIUM
WIRE**

- High current capacity
- Low silicates
- Superior deposition rate
- Tight and controlled chemistry



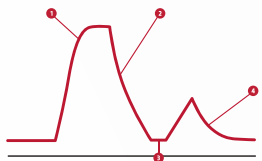
**MAXIMIZE
YOUR
WELDING
TIME**

- Complete wire feed system solution for bulk packaging

**TOTAL
SOLUTION
FOR GMAW HIGH
DEPOSITION
APPLICATIONS**

**ADVANCED
PROCESSES**

Low Fume Pulse™
RapidArc® waveform
Rapid X® waveform



1. Pulse Ramp / Peak 2. Tailout 3. Wet-in 4. Puddle Repulsion

- Unique waveforms for cost reduction and quality improvements



**WIDE RANGE
OF MECHANIZED
SOLUTIONS**

- Increases operating factor
- Reduces the welder's workload

**EQUIPMENT
PACKAGES TO
SATISFY YOUR
REQUIREMENTS**

**BASIC
PLATFORM**



**TECHNICAL
PLATFORM**



**ADVANCED
PLATFORM**



Syncs with
CHECKPOINT.

**SOFTWARE
SOLUTIONS**

- Take full control of welding process

**Weld Sequencer
True Energy®**

LINCOLN ELECTRIC EXPERIENCE IN HEAVY FABRICATION

Welding heavy components requires robust products and cutting-edge processes. Lincoln Electric's wide range of advanced power sources, quality-tested consumables and industry-leading application knowledge are a benefit to anyone involved in the manufacturing of heavy machinery.

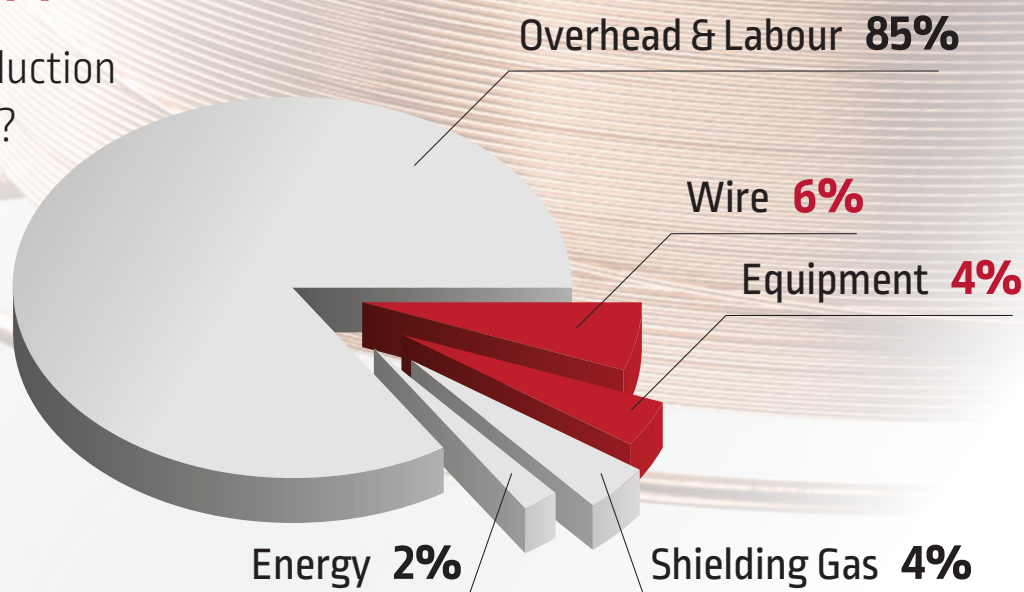
Lincoln Electric developed Supramig® HD Ø 1.32 mm on request and in cooperation with the leading yellow equipment manufacturers.

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THE RIGHT CHOICE OF GMAW WIRE COMBINED WITH THE RIGHT SOLUTION IMPROVES PRODUCTIVITY AND PROFITABILITY

What is your production cost composed of?

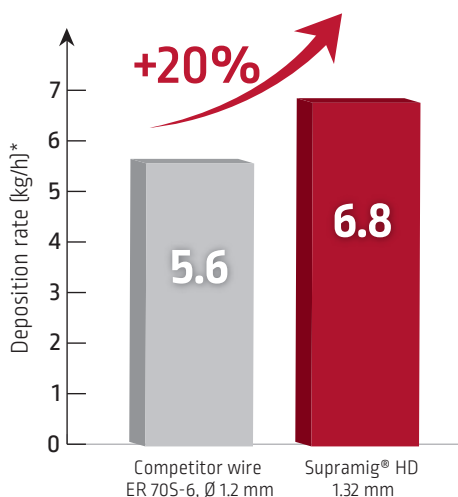


Increase your efficiency, reduce your labour cost by adopting the right solutions

SUPRAMIG® HD + Ø 1.32 mm – THE OPTIMAL WIRE AND DIAMETER FOR HIGH DEPOSITION APPLICATIONS

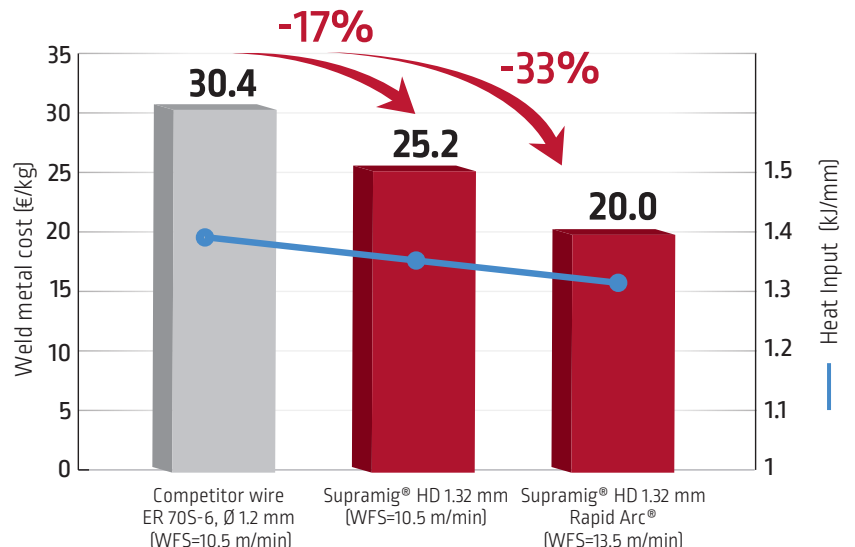
For customers typically welding 6–12 mm sized fillets with **amperages above 260 A** (WFS>8 m/min), Supramig® HD 1.32 mm has demonstrated the highest overall performance in repeated test conditions.

Effect of wire diameter on deposition rate. [*]



[*] Based on WFS of 10.5 m/min

Cost reduction in €/kg [*] and effect of Rapid Arc® on heat input.



[*] Based on labour cost of 40 €/kg, operating factor 25%

SUPRAMIG® HD
+
Ø 1.32 mm

➔

Increase your productivity by 20% without capital investment. OUR ADVANCED EQUIPMENT WILL CONTRIBUTE TO REDUCING YOUR WELD METAL COST UP TO 30%.

- Higher productivity and efficiency
- Better distribution of arc energy to weld pool
- Low silicate, less spatter & cleaning
- Best bead appearance
- More comfortable arc operability for the welder

EVEN IN TRADITIONAL CV MODE WIRE DIAMETER CHANGE ALLOWS PRODUCTIVITY IMPROVEMENT

Common 1.2 mm wire			Replace with	Supramig® HD 1.32 mm			Cost benefit		
Wire diameter (mm)	WFS (m/min)	Deposition rate (kg/h)		Wire diameter (mm)	WFS (m/min)	Deposition rate (kg/h)	Increase in deposition rate (%)	Savings per kg of weld metal (€)	Reduction in cost per kg of deposited weld metal (%)
1.2	8	4.30	➔	1.32	8	5.20	20.80	6.40	-17.00
1.2	9	4.80	➔	1.32	9	5.80	20.80	5.80	-17.00
1.2	10	5.30	➔	1.32	10	6.40	20.80	5.20	-16.50
1.2	11	5.80	➔	1.32	11	7.00	20.70	4.70	-16.40
1.2	12	6.40	➔	1.32	11.5	7.40	15.60	3.50	-13.00
1.2	13	6.90	➔	1.32	12	7.70	11.60	2.40	-10.00

Based on the labour cost of 40 €/h; Operating factor of 25%, in CV mode.

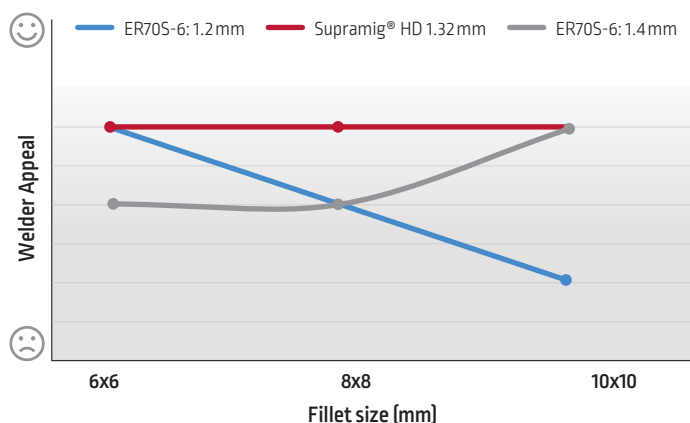
INCREASE THE OPERATING FACTOR WHILE PUTTING YOUR WELDER IN A MORE COMFORTABLE ENVIRONMENT

Tests using the same deposition rate but with different wire diameters have been conducted to compare welder appeal versus performance. Supramig® HD 1.32 mm demonstrated being the best solution.

Particularly, it has been noticed welders preferred Supramig® HD 1.32 mm due to:

- Same deposition rate with lower WFS
- Less vibration in the torch and no feeding problems
- Possibility to weld at higher parameters with no trouble, to finish the job more quickly
- Arc consistency and easier molten puddle control even at higher energy

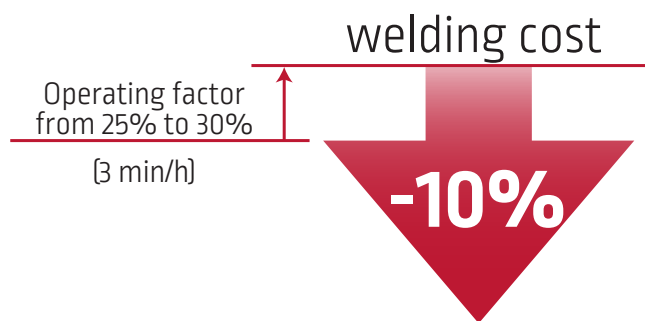
Welder appeal based on customer trials



* All wires are run at the same deposition rate for 6x6 mm, 8x8 mm & 10x10 mm fillets (respectively, 5.6 – 6 – 6.5 kg/h) and optimized welding parameters in CV mode.



Increasing welding time by 3 minutes per hour reduces the welding cost by 10%.



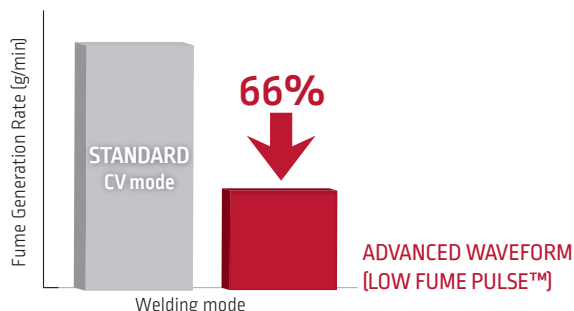
LOW FUME PULSE™

Advanced Waveform available with Power Wave®

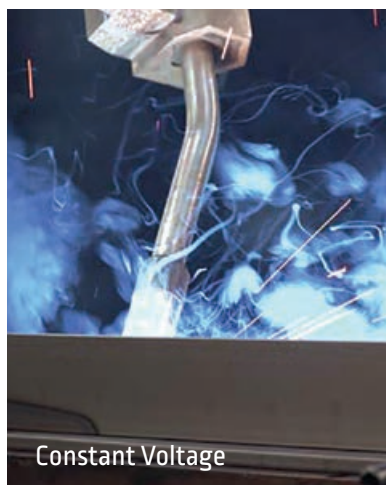
Reduction at the source

Unlike traditional Constant Voltage (CV mode) MIG, Low Fume Pulse™ utilizes patented Waveform Control Technology® for advanced arc performance, minimizing heat input and reducing weld fume generation directly at the arc.

Standard Waveform vs. Advanced Waveform (Low Fume Pulse™)



66% reduction in welding fume generation*



* 66% Fume Generation Reduction (grams/minute) based on Supramig® HD Ø1.32 mm, at WFS=10 m/min – same gas, same contact-tip-to-work-piece distance.



VIEW VIDEO

SUPRAMIG® HD – WITH CONTROLLED CHEMICAL COMPOSITION AT TIGHT TOLERANCE WITH AN ENGINEERED SURFACE CONDITION

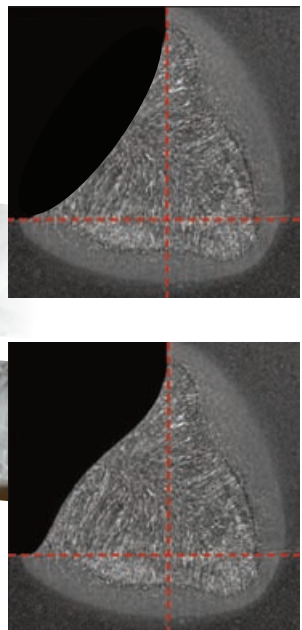
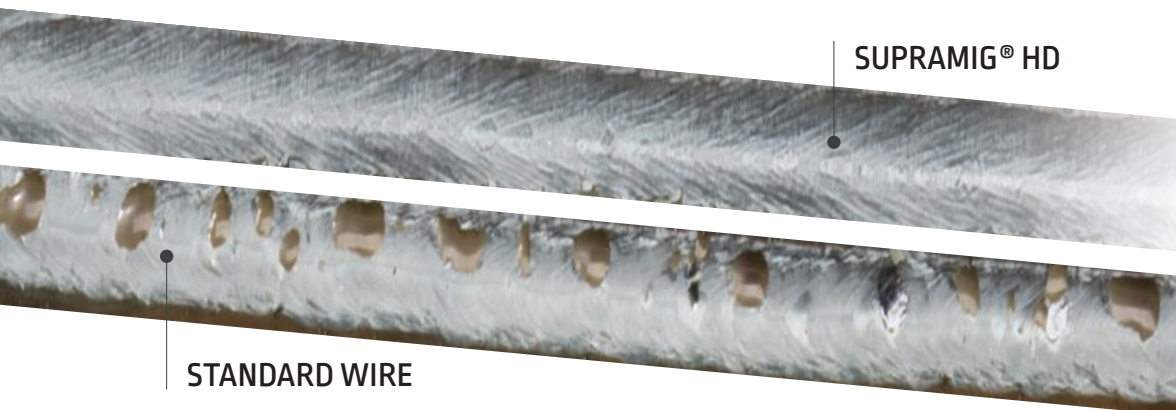
The Supramig® HD family of solid wires is made for welding applications requiring high deposition rates, as they can be found in the areas of heavy fabrication, manufacturing of earth moving, mining and agricultural equipment.

The weld metal is transferred to the weld pool in small droplets under high current condition. The result is a concave weld shape supporting higher levels of fatigue life essential in the heavy fabrication sector.

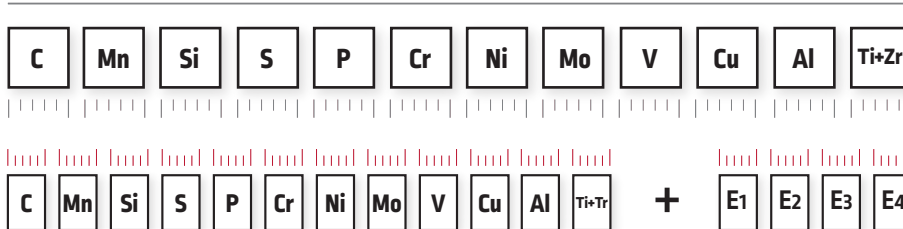
**CONSISTENCY
+
PREMIUM WIRE
=
CONFIDENCE**

PREMIUM PRODUCT

- Detachable silicate island
- Optimal bead profile
- Higher productivity, higher deposition rate



EN ISO RANGES



LINCOLN ELECTRIC RANGES

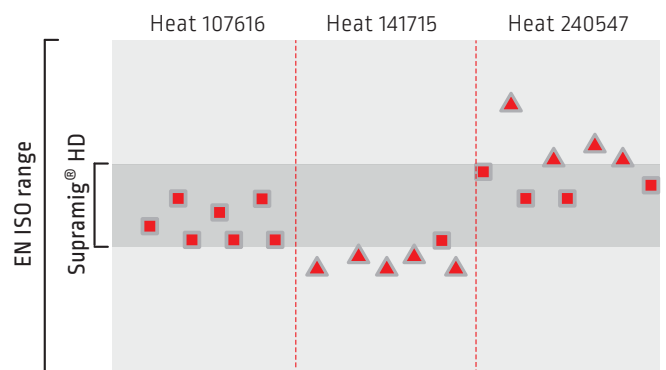
Specific additional elements control

We fix tighter ranges in the chemical composition and control more elements than required by AWS & ISO.

VERY STRICT QUALITY CONTROL SYSTEM

Quality MIG wire start with quality of raw materials

- Steel comprises of many elements, some of which are undesirable for welding
- We fix tighter ranges on our steel components and control more elements than required by EN ISO
- Steel is the highest contributing factor to MIG wire performance
- Not all steel mills know how to produce quality wire rod for drawing a welding wire
- We choose only the very best mills that provide a guarantee of quality throughout the steel making and rolling process to achieve good surface condition and preparation for drawing



We reject coils that do not meet our rigorous standards.

- - Coils dedicated to produce Supramig® HD
- ▲ - Coils are accepted because they are in the range of EN ISO but NOT used to produce Supramig® HD

UNIQUE ENGINEERED SURFACE CONDITION THAT IMPROVES ARC STABILITY

A unique engineered process is applied from start to finish in manufacturing to deliver a superior surface condition for welding:

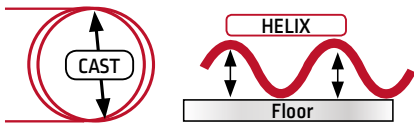
- Stable arc and excellent starting behaviour
- Reduced friction of the wire in the liners to support high speed feeding performance
- Reduced wear of expensive contact tips
- Optimal spray arc mode voltage



WIRE DIAMETER CAST AND HELIX

Wire tested for adequate feedability, arc stability and performance:

- Control of the wire diameter is essential in arc stability.
- A varying wire diameter will cause varying amperages and potentially varying weld penetrations.
- Cast and Helix are essential variables for wire feedability in Mild Steel MIG Wire



Cast and Helix are tightly controlled to ensure correct positioning of the wire as it comes out of the contact tip



A bad Cast and Helix can produce differences in arc shape and penetration profiles

ROBOT APPLICATION

Supramig® HD 1.32 mm geometrical characteristic and tight controlled chemistry, in combination with Accu-Trak® drums represents the best solution for robotic applications.

- Perfect and repeated wire placement on welding point
- No defects due to inconsistent wire positioning
- No spatter
- No wasting time for reparation and cleaning
- WFS up to 15 m/min
- Deposition rate up to 10 kg/h

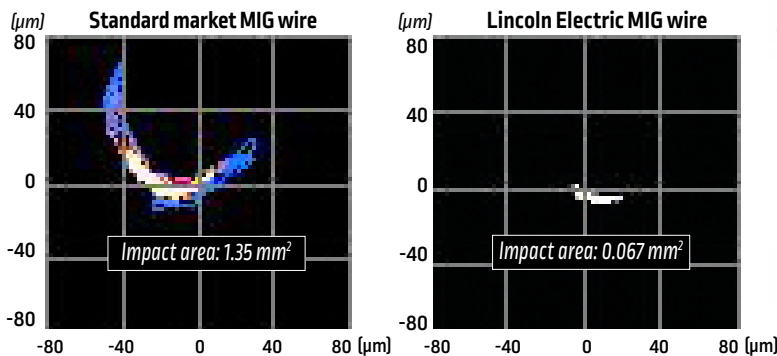
Example of bad wire placement



Example of good wire placement



Wire Placement Accuracy Test*



*Test measuring the wire placement area during 10 min of welding.



95% reduction of wire deviation with Lincoln Electric wire

MOVE FROM SPOOLS TO DRUMS: SAVE MONEY AND IMPROVE PRODUCTIVITY

- For conduits up to 3 m use the eco carton cover
- For conduits from 4 to 5 m use the hood cover (eco/fiber)
- For conduits longer than 5 m use the hood cover (eco/fiber) plus the wire feed assist

Fibre Hood Cover to be used with pneumatic feed assist

Ordered Separately

Drum type	250 kg	500 kg
ROUND ECO DRUM	AD1329-576	AD1329-211
ROUND FIBER DRUM	AD1329-208	-

ECO Carton Cover

Supplied with the drum, can be ordered individually if required

250 kg drums	500 kg drums
62FCOPEC	62FE0500

Drum Cart

Can be adjusted to the outside diameter of the drum and re-used for different drum sizes, having only one reference to manage in inventory. Can be used up to 500 kg of loading capacity.



Extra Flexible Conduits allow for a tighter radius on the conduit setup and have a low friction coefficient, ideal for robotic setups.

Recommended to use together with the **Strain Relief Connector** 4 attached to the **Direct Pull Kit** 3.

Stationary or Polymeric Conduits have a very low friction coefficient, less than steel lined conduits and are suited in stationary or moving feed units.

Recommended to use with **Compression Connectors** 4.

REDUCE YOUR DOWNTIME, IMPROVE YOUR COST SAVING:

Move from spools to Accu-Trak® 250 kg or 500 kg, save money and improve productivity.



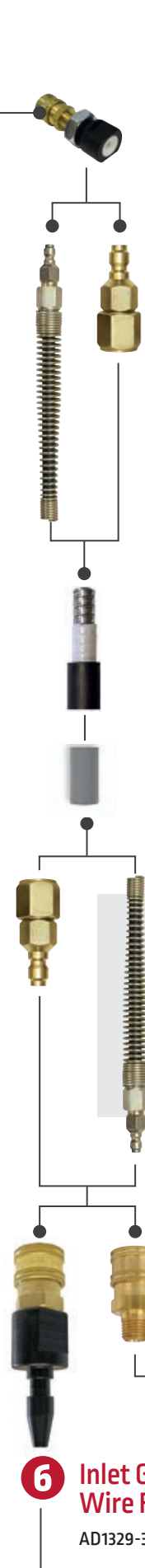
- Move to infinity solution
- 24/7 working time = 0 downtime for packaging changing (*)

* Full set of accessories for joining wire available. Ask for more information



Savings -21%
[-5,940 €]

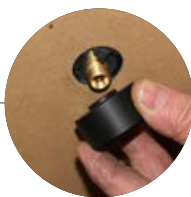
		Spool	250 kg Accu-Trak® drum	
		Supramig® HD 1.32 mm		
CONSUMABLE COST	Wire	[€/kg]	1.70	1.75
	Labour cost	[€/h]	40	40
CHANGE OVER COST	Change over time	[min]	15	30
	# of change over		750	48
	Consumption per year	[kg]	12,000	
TOTAL	Change over time	[h]	187.50	24
	Change over cost	[€]	7,500	960
	Consumable cost	[€]	20,400	21,000
	Total cost	[€]	27,900	21,960
	Time saving	[h]		164 h
	Cost saving	[€]		-5,940 €
	Cost saving			-21%



3 Direct Pull Kit
1/4 Inch

AD1329-6

Cover inside



Cover outside



4 Connectors

Steel Spring Strain Relief

Wire diameter	Extra Flexible	Polymeric
0.8 through 1.4 mm	AD1329-43	AD1329-25
1.6 through 2.0 mm	AD1329-31	AD1329-31

Compression Connector

Wire diameter	Extra Flexible	Polymeric
0.6 through 0.8 mm	-	AD1329-284
0.9 through 1.4 mm	AD1329-42	AD1329-24
1.6 through 2.0 mm	AD1329-30	AD1329-30

5 Conduits

Wire diameter	Extra Flexible	Polymeric
0.6 through 0.8 mm	-	AD1329-588
0.9 through 1.4 mm	AD1329-617	AD1329-594
1.6 through 2.0 mm	AD1329-623	AD1329-597

Strain Relief Connectors

- Works great with feeder inlet adapters
- Prevents conduit droop and recasting of wire due to tight conduit radiuses
- Reduces stress on the quick connect points in robotic applications

7 8

Quick Disconnect and Inlet Guide for Wire Feeder

Ask for reference

6 Inlet Guides for LEE Wire Feeders

AD1329-335



Wire Feeder

Wire Feed Assist

By using the **Pneumatic Feed Assist (PFA)** you can bridge distances up to **30 meters**.

This opens lots of opportunities to place the drum at long distance to **avoid substantial loss of time** by replacing and handing the drums. It is even possible to leave the drum on the pallet and not to move it at all.



THREE RECOMMENDED EQUIPMENT SOLUTIONS

1 BASIC

CV-510
with Linc Feed 33

- Robustness
- High power
- Low investment



Output Input

CV **3**
PHASE

DC **50/60**
Hz

Output Input

34-44 VAC



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2 TECHNICAL

Speedtec® SP series
with PF 42, 44 or 46

- High productivity with possibility of pulsed mode



Output Input

CC CV **3**
PHASE

DC **50/60**
Hz

Output Input

40 VDC



GO TO WEB PAGE

3 ADVANCED

Power Wave® S series
with PF46 or Power Feed® 84

- High productivity with possibility to use advanced arc processes and software for a complete weld control
- STT®
- Rapid X®
- Rapid Arc®
- Low Fume Pulse™



Output Input

CC CV **3**
PHASE

DC **50/60**
Hz

Output Input

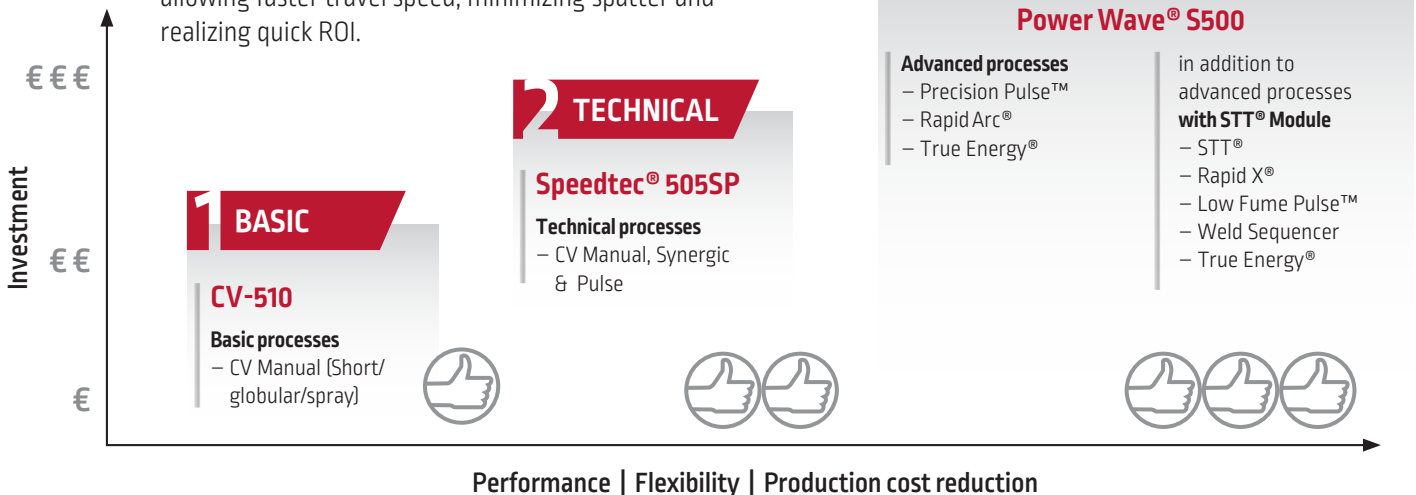
40 VDC



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SELECT THE RIGHT EQUIPMENT FOR YOUR JOB

Investing in waveforms (Rapid Arc®, Rapid X®, Low Fume Pulse™) gives you the possibility of increasing productivity, allowing faster travel speed, minimizing spatter and realizing quick ROI.



WIRE FEEDER SUGGESTIONS

Equipment	Wire Feeders			
	Linc Feed 33	PF 42	PF 46	Power Feed® 84
CV-510	•			
Speedtec® 505SP		•	•	
Power Wave®			•	• (1) (2)

(1) available as dual too, (2) allows the use of Weld Sequencer

3 ADVANCED



DOWNLOAD
POWER WAVE
SOLUTIONS
BROCHURE

RAPID X®

High-speed pulse modes designed with an extreme short arc length and short circuit response to minimize spatter and improve travel speed. Rapid X® represents the new generation of Rapid Arc®.

- Extremely fast travel speed
- Clean welds and lower heat input

EXAMPLE OF COST SAVING USING RAPID X® AND SUPRAMIG® HD 1.32 mm

For this test, a complete metallic frame with different types of joints has been welded (see picture):

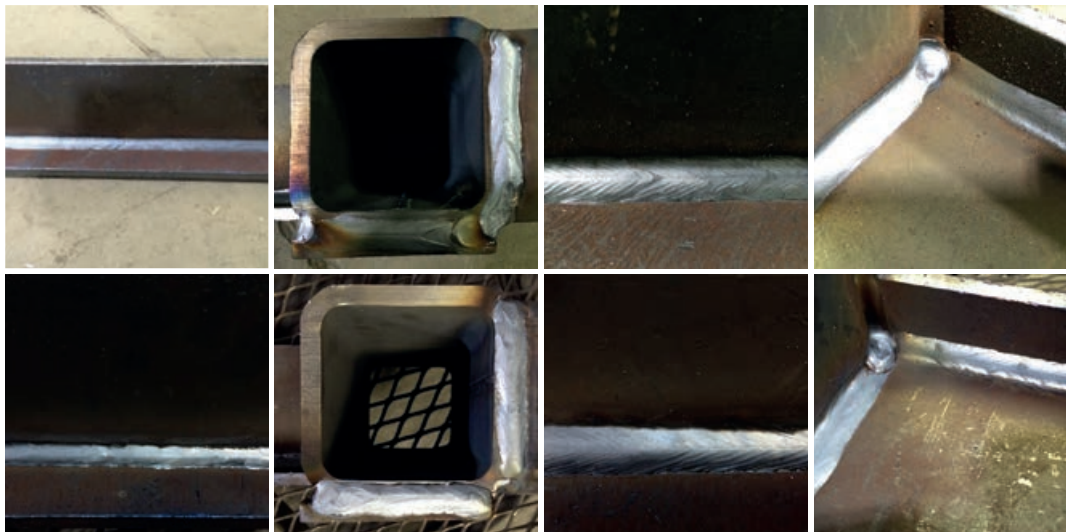
- Supramig® HD Ø 1.2 mm in CV mode
- Supramig® HD Ø 1.32 mm with Rapid X®



		GMAW semi-automatic solid wire	
		Supramig® HD	
		CV	Rapid X®
Electrode diameter	[mm]	1.20	1.32
WFS	[m/min]	10.60	9.30
Travel speed	[cm/min]	25.00	30.00
Operating factor	[%]	25	25
Time to lay 1 m	[h/m]	0.27	0.22
LABOUR COSTS AND OVERHEAD	Labour & OH rate	[€/h]	40
	Total labour & OH	[€/m]	10.67
COST OF CONSUMABLES	Price of welding electrode	[€/kg]	1.50
	Total material cost per meter of welding	[€/m]	0.58
TOTAL WELDING COST per meter of welding		[€/m]	11.33
Savings per 1 m of welding		[€]	1.78
Customer's saving per 1000 m of welding		[€]	1,780

Travel speed vs. 1,2 mm diameter
+19%

Savings
per meter of welding
16%



Supramig® HD Ø 1.2 mm
Average travel speed: 25 cm/min

Supramig® HD Ø 1.32 mm
Average travel speed: 30 cm/min

WELD SEQUENCER

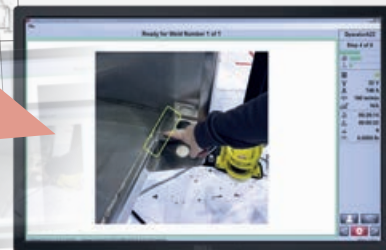
Changing what was done with written instructions to an operator guided complete welding system.

It is no longer difficult to train operators, interpret work instructions and prints, or execute and verify welds.

- Guide operators step-by-step
- Easy to follow graphical interface
- Clearly define each assembly step
- Clearly define each weld placement



FOR MORE INFORMATION SCAN HERE



INFORMATION THAT LEADS TO SOLUTIONS®

Understanding the true cost, true performance and true quality of your welding operation is vital. Your customers expect it and your business profitability demands it. Yet relying on traditional methods to collect and analyse operator metrics takes up valuable man-hours and often does not provide a true representation of your entire welding process.

Power Wave's® advanced production monitoring technology allows you to break away from these old methods with an intelligent, IoT driven platform. Delivering a complete, real-time view of your entire welding operation, the Power Wave® platform provides the precise information you need to deliver data-driven decision-making and process improvements.

CHECKPOINT®

Data Collection

- Every operation – big or small strives for making the best weld, in an efficient way, with zero defects, while meeting demand
- The challenge is – how do you know?
- Hard to determine without TRUE picture of welding operation



FOR MORE INFORMATION SCAN HERE

With Checkpoint® you can:

- Identify the TRUE COST of welding
- Evaluate the TRUE QUALITY of welding
- Deliver the TRUE PERFORMANCE of welding

Powerful Data Visualization

- Full visibility of your welding operation
- Real-time dashboard snapshots
- In-depth weld analytics

Easy Data Exporting

- Export the raw data
- Crunch the numbers the way YOU want

TRUE ENERGY®

When replacing 1.2 mm solid wire with Supramig® HD 1.32 mm, the first operator observation is about the increase in current. Larger wire diameter enables to weld faster (higher deposition rate) while keeping heat input almost unchanged.

True Energy® is a proprietary Lincoln Electric technology that uses the digital control system embedded in each Power Wave® arc welding power source to measure and calculate the instantaneous amount of energy put into a weld. Customers can then use this value, in conjunction with the length of the weld, to get the heat input. Heat input calculations are used extensively in the welding industry, and the accurate calculation of these values is of utmost importance.

- Built in to all Lincoln Electric Power Wave® power sources.
- Easily comply with heat input calculations per ASME code
- No extra equipment or measuring tools necessary.

Traditional Heat Input Calculation

$$\text{HEAT INPUT} = \frac{V * A * 60}{\text{Travel Speed}} = \text{kJ/mm}$$

True Energy® Heat Input Calculation

$$\text{HEAT INPUT} = \frac{\text{True Energy® Value}}{\text{Distance Traveled}} = \text{kJ/mm}$$



FOR MORE INFORMATION SCAN HERE

MIG GUN

LGS2 505W

Simple and reliable water-cooled heavy-duty torch (500 A @ 100%) for high productivity in steel industry with Supramig® HD1.32 mm

STANDARD RANGE



500 A @100%

To order

	LGS2 505W
3 m	W10429-505-3M
4 m	W10429-505-4M
5 m	W10429-505-5M

WST2 FUME ASPIRATION TORCHES

Improve the welder environment using a fume aspiration torch. WST2 is the ideal choice. Fume extraction at high rate thanks to an advanced air flow design.

WST2
water cooled



450 A @100%

WST2 torches
are compliant to
EN 60974-7 and to
French INRS 1st July
2015 regulation.

To order

	WST2.5W
3 m	W000381907
4 m	W000381908
5 m	W000381909

Contact tip for Ø1.32 wire

M8 x 30

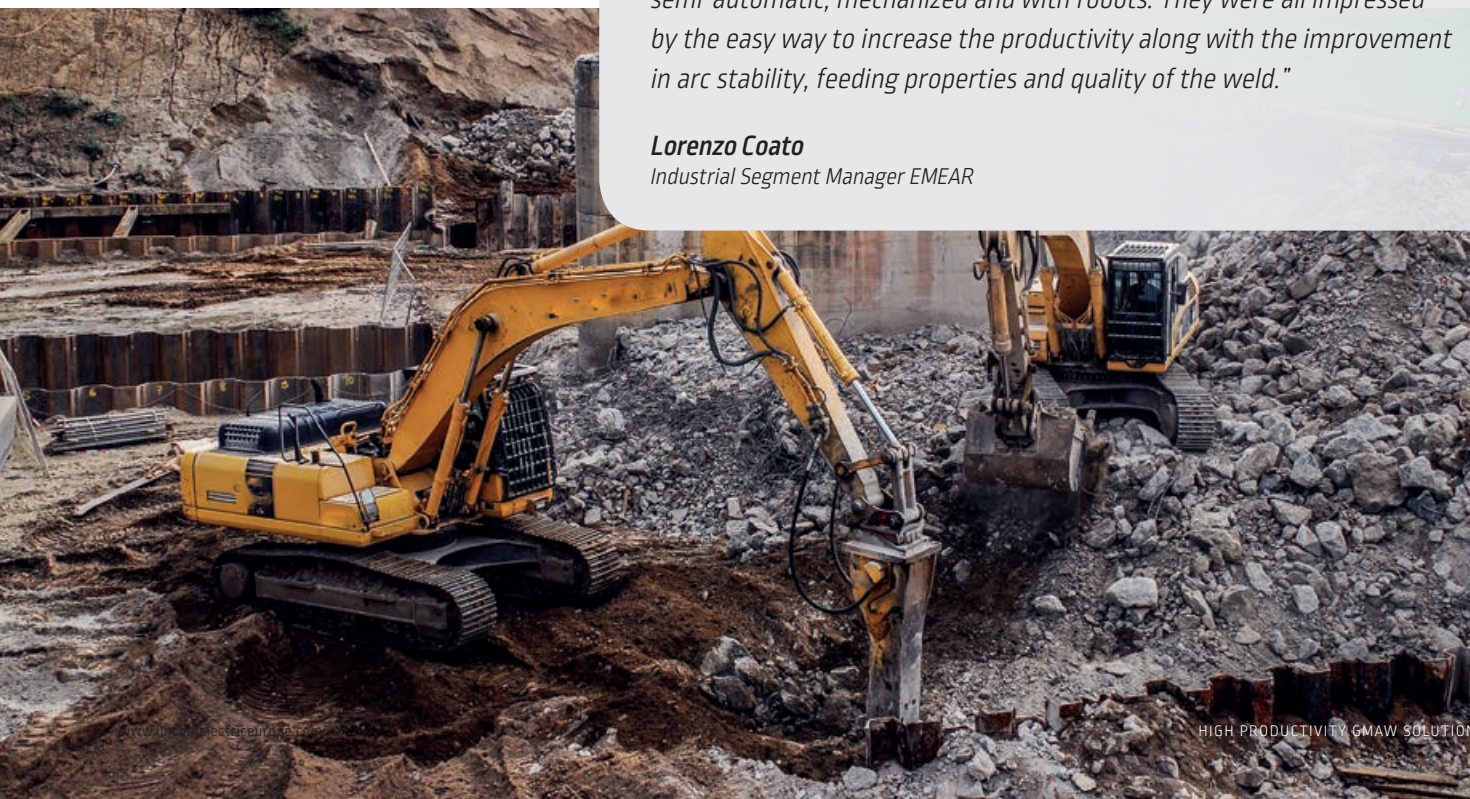
WP10445-132C



CUSTOMER FEEDBACK

"We tested the solution with several clients active in heavy fabrication and structural steel. We were trying it with different processes: semi-automatic, mechanized and with robots. They were all impressed by the easy way to increase the productivity along with the improvement in arc stability, feeding properties and quality of the weld."

Lorenzo Coato
Industrial Segment Manager EMEAR



EXAMPLES OF MECHANIZED APPLICATIONS

Effective mechanization enables productivity improvement, increasing the duty cycle up to 70%.



VISIT WEB PAGE

WELDYCAR AND SUPRAMIG® HD 1.32 mm

- Operating factor up to 70%
- Faster travel speed
- In combination with Rapid Arc® / Rapid X® processes, reduced cleaning time due to less spatter



Long seam welds in structural steelwork / transport equipment

WELDING PROCESS DATA

PROCESS DESCRIPTION	GMAW Solid wire	
	1	2
TEST N°		
Filler metal	Supramig® HD	Supramig® HD
Welding mode	CV – manual welding	CV – Weldycar
Electrode diameter	[mm]	1.32
WFS	[m/min]	10.60
Deposition rate	[kg/h]	6.83
Operating factor	[%]	25
LABOUR COSTS AND OVERHEAD	[€/h]	40
COST OF CONSUMABLES	[€/kg]	1.70
TOTAL WELDING COST	[€/kg]	25.18
Savings per kg of deposited material	[€]	15.06
Saving per year considering a consumption of 10,000 kg	[€]	150,000
TOTAL WELDING COST PER METER	[€/m]	7.60
Savings per 1 m of welding	[€]	4.54
Customer's saving per 10,000 m of welding	[€]	45,000

Savings 60%

CB MATIC

Take the gun out of the welder's hand, increase daily production, reduce cycle time and welder effort by combining Supramig® HD 1.32 mm with CB MATIC and PowerWave® S500.

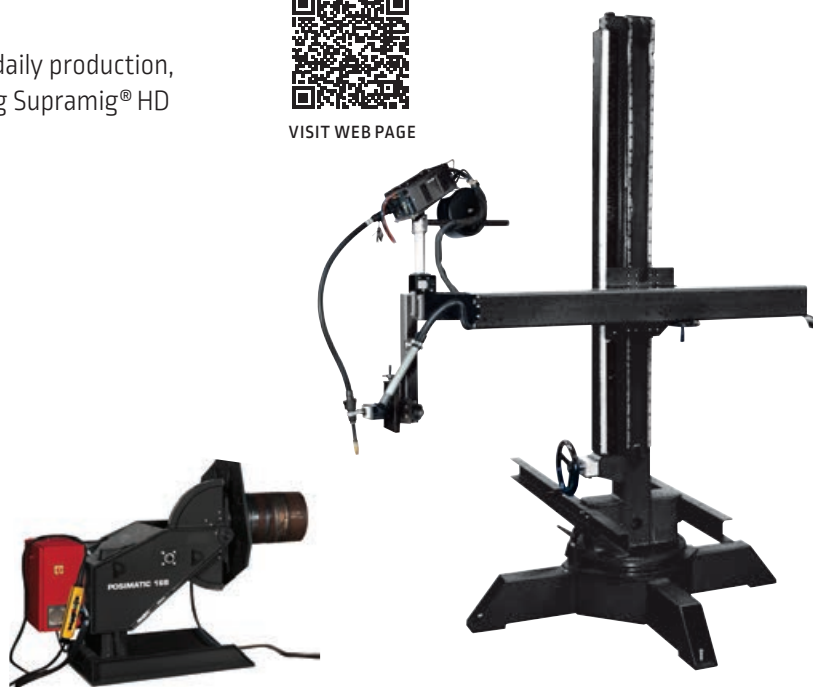


VISIT WEB PAGE

Typical configuration

1.2 x 1.2 or 1.8 x 1.8 m column and boom for GMAW circumferential welding.

- Easy set-up for pipe welding or tube / flange welding
- Power Wave® S500 with STT®
- Single or dual feeder Power Feed® 84
- Positioner Posimatic
- Supramig® HD Ø 1.0 mm for root pass in STT® technology
- Supramig® HD Ø 1.32 mm for filling / fillet weld with advanced waveforms



TAKE THE NEXT STEP

TECHNICAL SPECIFICATIONS SUPRAMIG® HD



VISIT WEB PAGE

SUPRAMIG® HD

AWS 5.18: ER70S-6

ISO 14341-A: G 46 4 M 3Si1 / G 42 3 C 3Si1

APPROVALS

ABS	BV	DNV	GL	LR	TÜV	DB	CE
+	+	+	+	+	+	+	+



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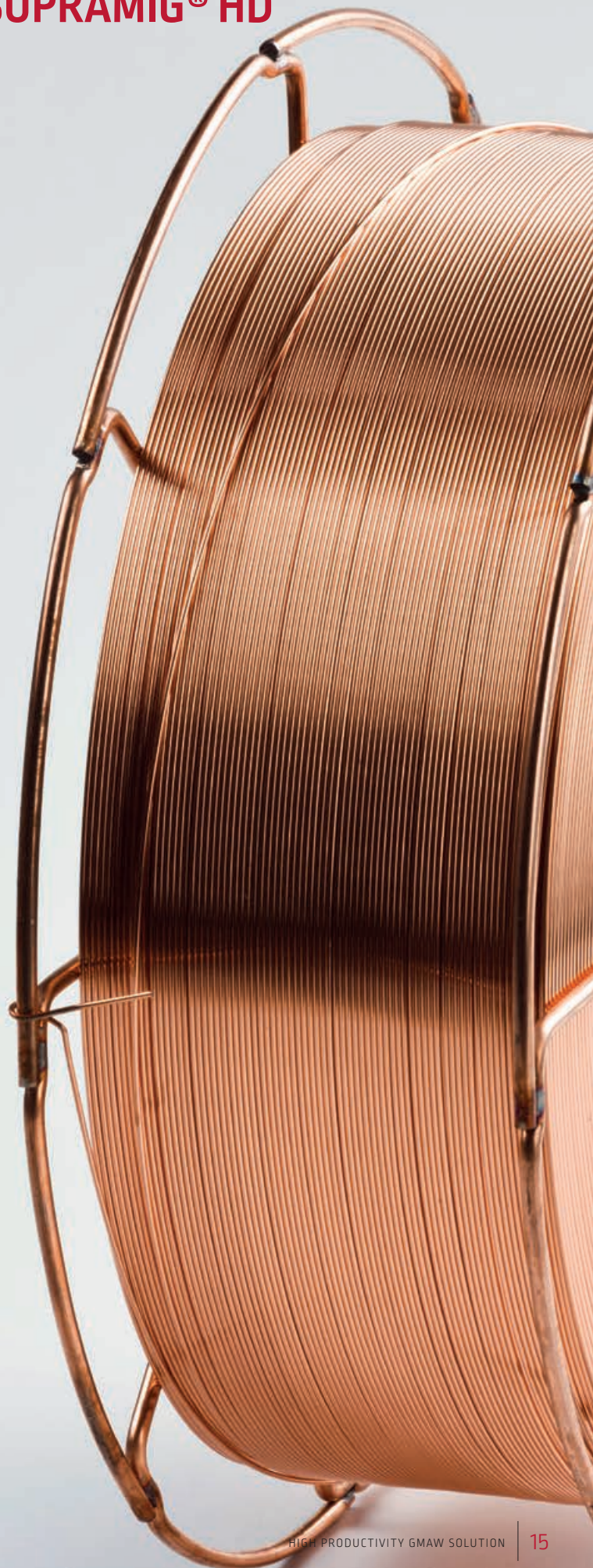
SUPRAMIG® ULTRA HD

AWS 5.18: ER70S-6

ISO 14341-A: G 50 5 M 4Si1 / G 46 3 C 4Si1

APPROVALS

ABS	BV	DNV	GL	LR	TÜV	CE
+	+	+	+	+	+	+



BEING PRESENT LOCALLY MAKES US MORE AWARE GLOBALLY

Benefit from the Market Leader

120+
YEARS OF EXPERIENCE

160 ACTIVE IN 160
COUNTRIES
WORLDWIDE

325+
R&D ENGINEERS
WORLDWIDE



CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company® is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

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