

TOTAL WELDING SOLUTIONS

FOR THE SHIPBUILDING INDUSTRY



www.lincolnelectric.eu

LINCOLN[®]
ELECTRIC

SHIPBUILDING WELDING SOLUTIONS

For over 125 years, Lincoln Electric has been at the forefront of arc welding, automation, and innovation. Our advanced solutions are paired with unwavering support across the globe.

In shipbuilding, our extensive expertise in welding, cutting, and automation ensures adherence to stringent codes and aims to maximize your return on investment.

Our customized solutions are designed to deliver unmatched efficiency, reliability, and value. Rely on Lincoln Electric for superior shipbuilding solutions, built on a legacy of excellence

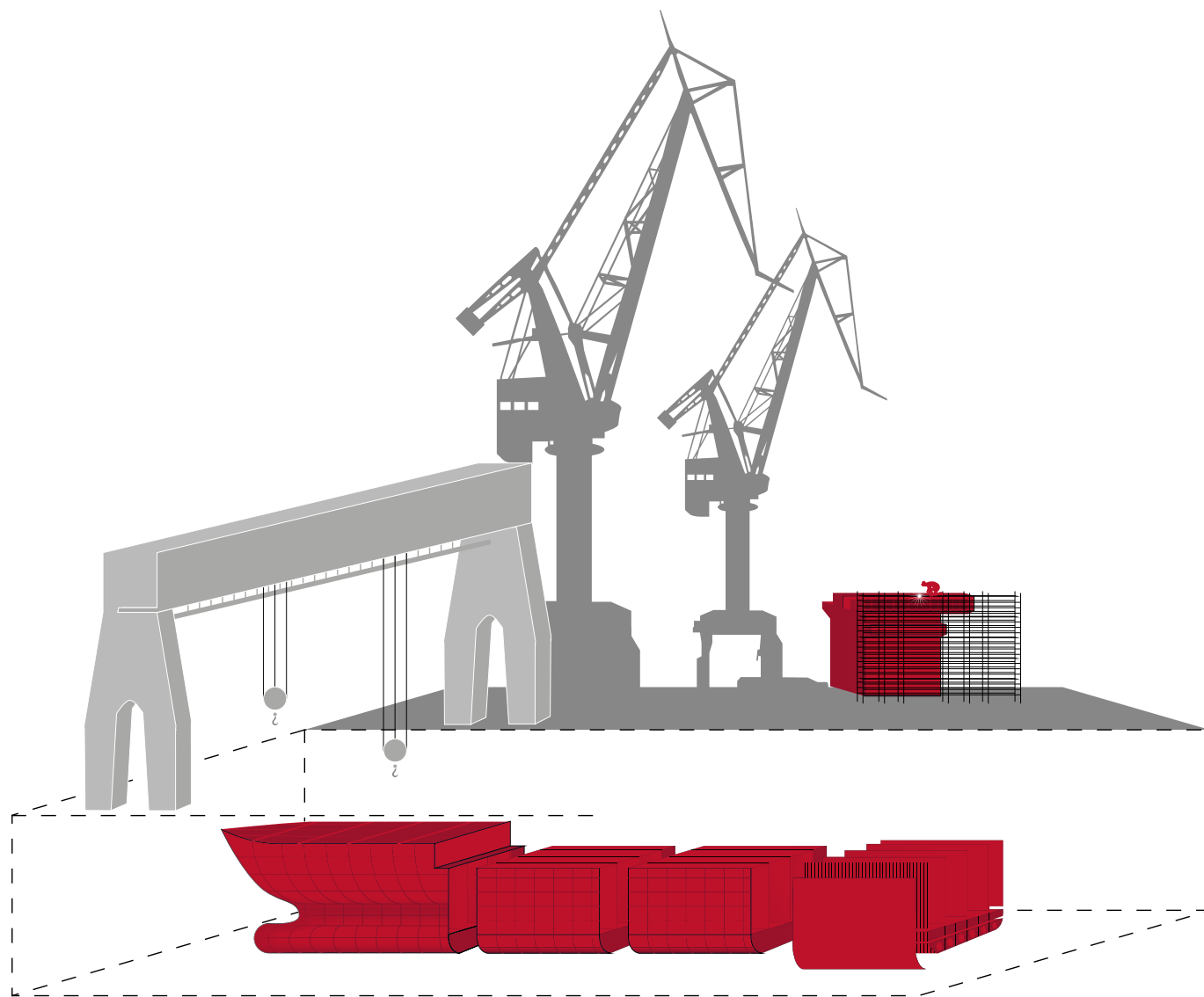




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WELDING SOLUTIONS FOR SHIPBUILDING

Lincoln Electric offers Total Welding Solution for all types of vessels:
Regular ships, Chemical tankers, Liquid gas carriers, Submarine vessels,
Defence surface ships, Aluminum boats.

REGULAR SHIPS



Toughness
and strength
Weldability

USED WELDING PROCESSES

- SMAW
- GMAW
- FCAW
- SAW

SUBMARINE VESSELS



High strength
Tempered steels

USED WELDING PROCESSES

- SMAW
- GMAW
- FCAW
- SAW

DEFENCE - SURFACE SHIPS



High strength
Light weight
Stealth technology
Modular design

USED WELDING PROCESSES

- SMAW
- GMAW
- FCAW
- SAW

CHEMICAL TANKERS



Duplex stainless steel
Higher strength
Corrosion resistant

USED WELDING PROCESSES

- SMAW
- GMAW
- FCAW
- SAW

LIQUID GAS CARRIERS



Cryogenic steels
-163° C methane

USED WELDING PROCESSES

- SMAW
- GTAW
- GMAW
- FCAW
- SAW

ALUMINIUM BOATS



Good impact toughness
Light weight
Corrosion resistant

USED WELDING PROCESSES

- GTAW
- GMAW



REGULAR SHIPS, CRUISE LINERS, CONTAINER SHIPS

Major Classification Societies as Det Norske Veritas, Bureau Veritas, Lloyds Register, Germanischer Lloyd and the American Bureau of Shipping, led to grading of mild steels of between **0.16% to 0.23% Carbon content**. Grades **A, CS, DS, B, D, and E** are progressively tougher mild steels. **High strength steels** have three grades, **AH, DH and EH**. Each of these high tensile grades is available in three levels of strength, **32, 36 and 40**, the latter being the strongest. Toughness and strength are determined at the steel mill by means of process control and the addition on traces of aluminium, niobium and/or vanadium.

Weldability is of preliminary importance; shipyards require: “no preheat and no complex procedures”.

This result in a restriction on steel types, high carbon steels can't be used to enhance strength because **HAZ cracking must be avoided**.

High tensile welding consumables are to be used for high tensile steel, f.e. in submarines. Carbon equivalent (CE) is used to indicate permissible levels of alloying elements and carbon in steel for specific welding conditions.



CHEMICAL TANKERS

Chemical tankers are a composition in **duplex stainless steel**. Duplex stainless steel is finding an increasing uptake in the shipbuilding sector, mainly due to its **higher strength** and **corrosion resistance** properties.

The cargo tanks are constructed from **duplex stainless steel UNS S32205 (Mat. Nr. 1.4462)** which is a higher grade of stainless steel as opposed to austenitic AISI 316LN grade (UNS S31653) that is often used for inland navigation tankers.

Duplex stainless steel has a higher strength combined with a **favorable corrosion resistance** (excellent stress and pitting corrosion), two properties that have governed the choice of this material as a way of increasing the number of chemical products that can be loaded and transported by these chemical tankers.

The **corrosion resistance** can be calculated and expressed by the **Pitting Resistance Equivalent (PRE)**, adjusted for nitrogen containing stainless steel.

Duplex stainless steel UNS S32205 (Mat. Nr. 1.4462) also has **excellent weldability**. Depending on the required welding positions during construction, as well as the various base material combinations, the selection of **welding processes** and **welding consumables** have been made and tested in accordance with the rules of the shipbuilding Classification Societies.





DEFENCE - SUBMARINES

For Submarine Vessels, high strength is required due to the pressures encountered at depth. High strength Quenched and Tempered steels with a **high carbon equivalent** value are used. **Welding is consequently more complex.** Typical steels for submarine applications are **HY 80, HY 100, HRS 650M.**



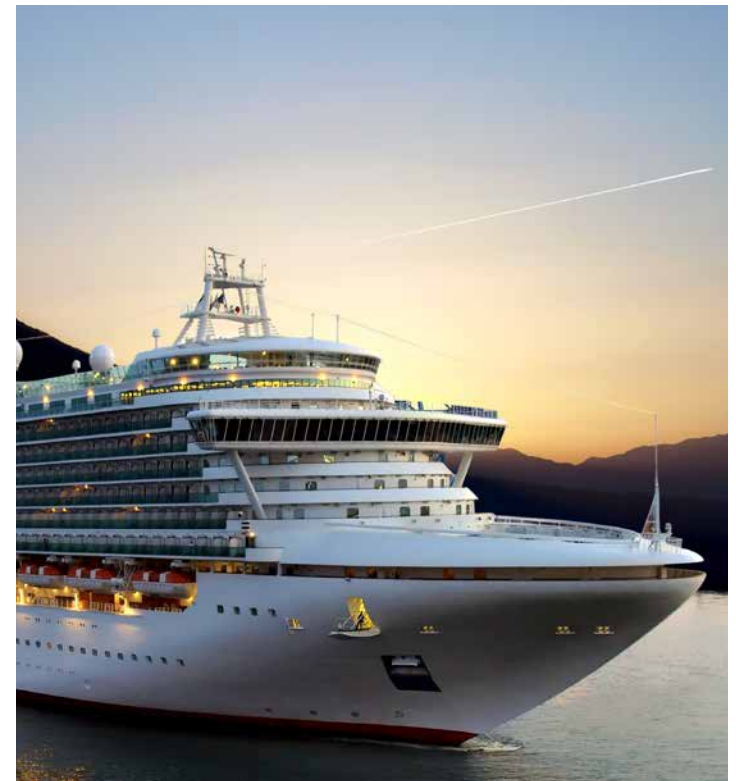
DEFENCE - SURFACE SHIPS

Surface ships in Defence refer to naval warships designed for warfare on the water's surface, capable of engaging various targets. Their main characteristics lightweight, high-strength materials like advanced composites and steels, along with stealth technology to reduce radar and sonar signatures, and modular designs for adaptability and rapid customization. Typical material steel used are **EH32, EH36.**



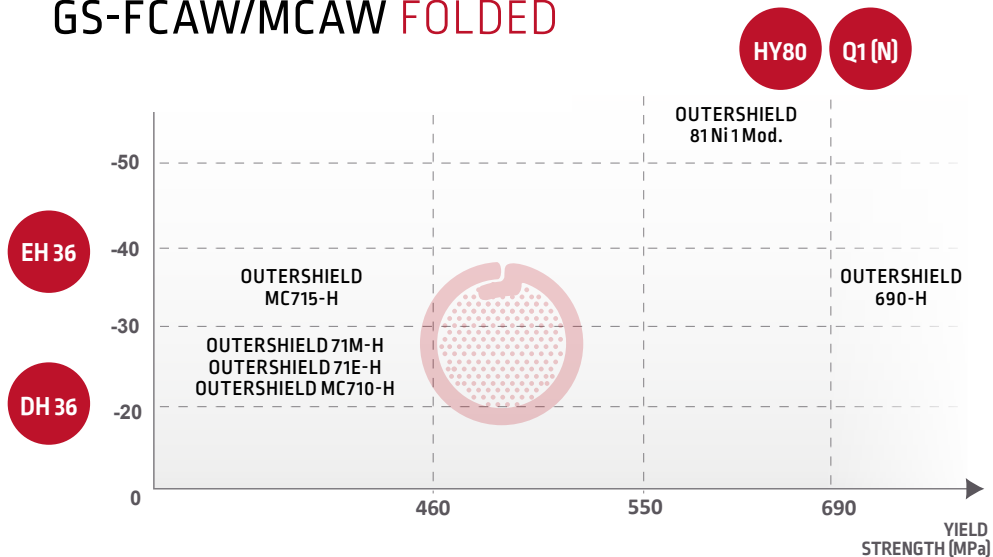
PLEASURE BOATS

Aluminium has been used in shipbuilding industry as marine vessels, Yachts etc. for more than 100 years because of its light weight and ease of fabrication. **Aluminium combines both good corrosion and fatigue resistance.** For the hull construction commonly **5086 (AlMg4Mn)** and **5083 (AlMg4.5Mn)** are used and are easy to weld. Hull plating of 4.5 mm and above easily accommodates **MIG-Pulse welding.** **TIG welding** will be used for the more difficult detailed work such as attachments.

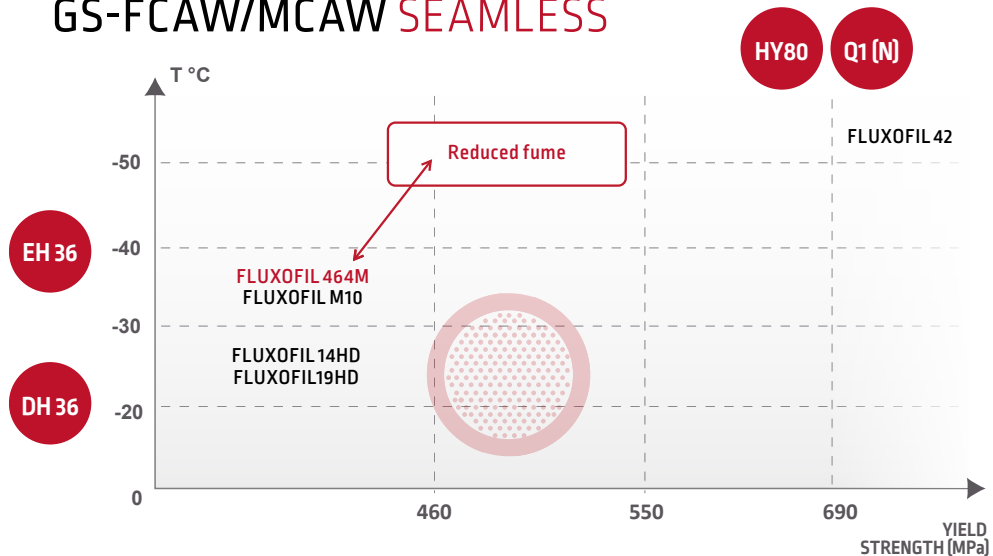


WELDING CONSUMABLES SOLUTIONS

GS-FCAW/MCAW FOLDED



GS-FCAW/MCAW SEAMLESS



Process	Product name	Classifications		Approvals
		AWS	EN ISO	
MCAW	Outershield MC710-H	E70C-6M H4	T 46 3 M M21 2 H5	ABS, LR, BV, DNV, RINA, TÜV, DB
	Outershield MC715-H	E70C-6M H4	T 46 4 M M21 2 H5	ABS, LR, BV, DNV, TÜV, DB, CWB
FCAW	Outershield 71M-H	E71T-1/9C-H4 E71T-1/9M-H4	T 46 3 P C1 1 H5 T 46 2 P M21 2 H5	ABS, LR, BV, DNV, RINA, CRS, PRS
	Outershield 71E-H	E71T-1M-J E71T-1C-H4	T 46 3 P M21 1 H5 T 42 0 P C1 1 H5	ABS, LR, BV, DNV, RINA, TÜV, CWB
	Outershield 81Ni1H	E81T1-Ni1M-J	T 50 5 1Ni P M21 2 H5	ABS, LR, BV, DNV, TÜV
	Outershield 690H	E111T1-K3M-JH4	T 69 4 Z P M21 2 H5	ABS, DNV

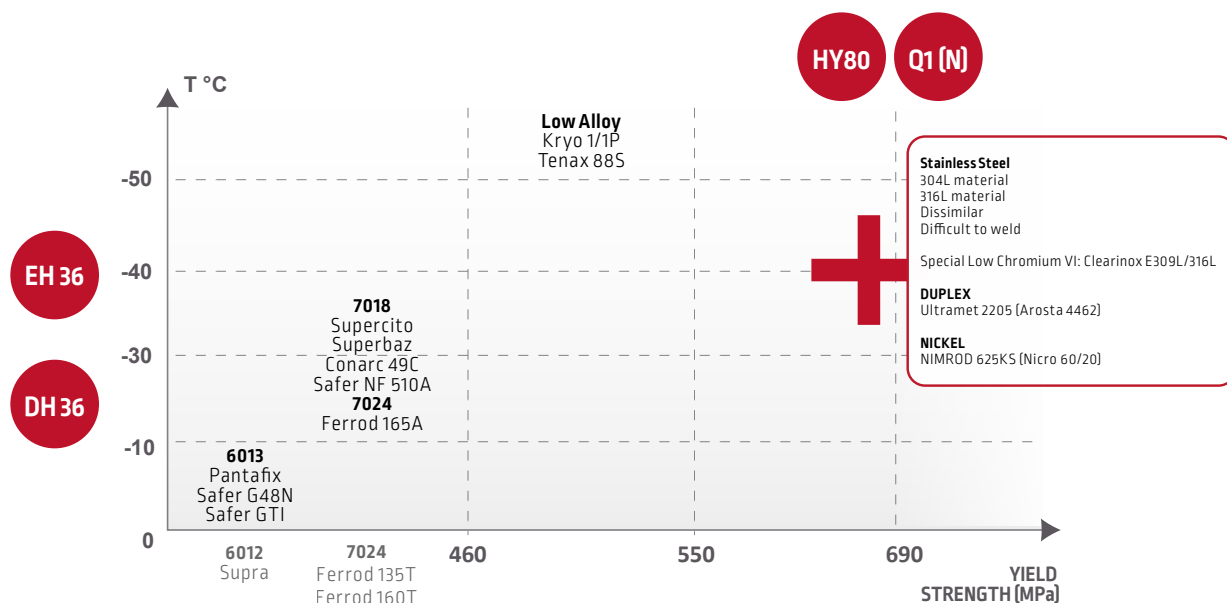
- Coils [5/16kg]
- PE Foil and/or Aluminum Foil



Process	Product name	Classifications		Approvals
		AWS	EN ISO	
MCAW	FLUXOFIL M10	E70C-6M H4	T 46 4 M M21 1 H5	ABS, LR, BV, DNV, TÜV, DB, CWB
	FLUXOFIL 14HD	E71T-1M-J E71T-1C-H4	T 46 3 P M21 1 H5 T 46 2 P C1 1 H5	ABS, LR, BV, DNV, RINA, TÜV, DB, CWB
FCAW	FLUXOFIL 19HD	E71T-1C-JH4	T 46 3 P C1 1 H5	ABS, LR, BV, DNV, RINA, TÜV, DB
	FLUXOFIL 464M	E71T-1M-JH4	T 46 4 P M21 1 H5	ABS, LR, BV, DNV, RINA, TÜV, DB
	FLUXOFIL 42	E110T5-K4M-H4	T 69 6 Mn2NiCrMo B M21 2 H5	ABS, BV, DNV, TÜV, DB, CCS

WELDING CONSUMABLES SOLUTIONS

MMA



Carton Boxes

Universal packaging for stick electrodes



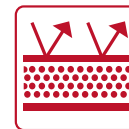
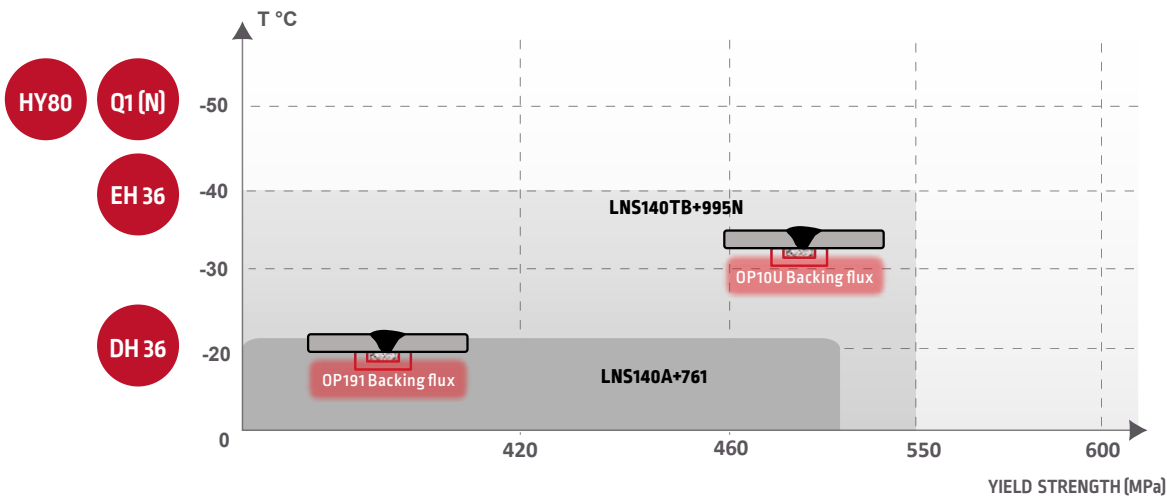
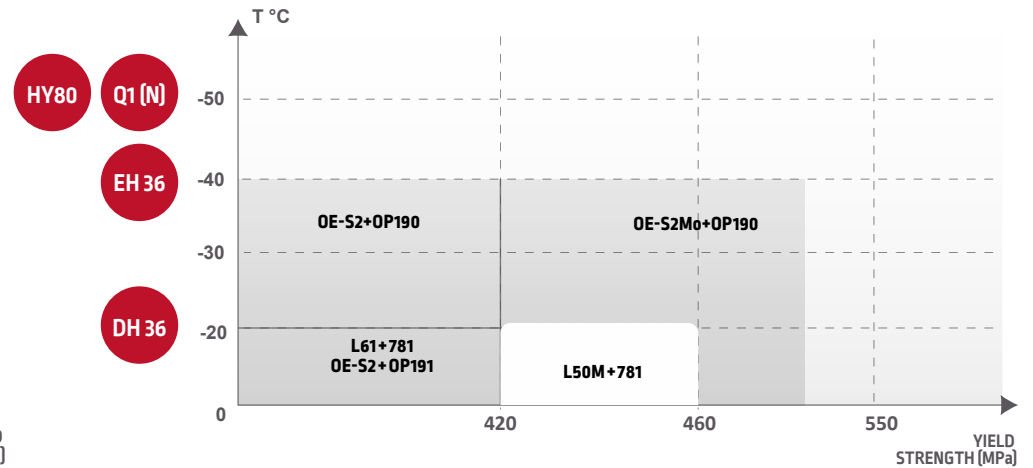
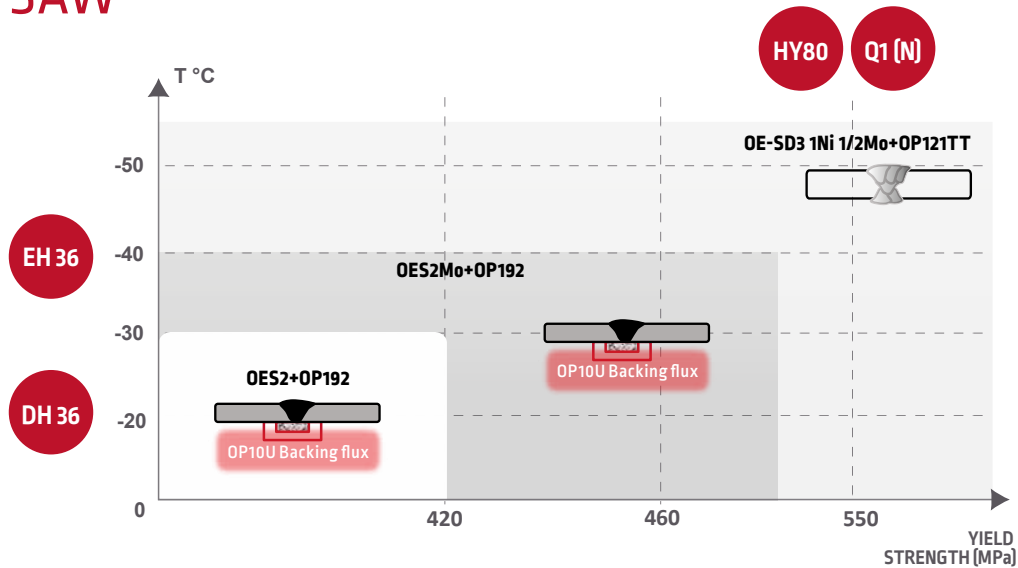
VPMD vacuum pack

A rugged multi-layer Al-PE foil is used as barrier against moisture absorption.

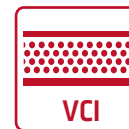
Alloy	Product name	Classifications		Approvals
		AWS	EN ISO	
Mild steel	PANTAFIX	E6013	E 38 0 RC 11	TÜV
	SAFER G48N	E6013	E 38 0 RC 11	LR, BV
	SAFER GTI	E6013	E 42 0 RC 11	LR, BV, TÜV
	SUPERCITO	E7018-1 H4	E 42 5 B 42 H5	ABS, LR, BV, DNV, RMRS, TÜV, DB
	SUPERBAZ	E7018 H4	E 42 4 B 42 H5	ABS, LR, BV, DNV, RINA, TÜV, DB
	CONARC 49C	E7018-1 H4R	E 46 4 B 32 H5	ABS, LR, BV, DNV, TÜV, DB
	SAFER NF 510A	E7018 H4	E 42 4 B 32 H5	ABS, LR, BV, DNV, RINA, TÜV
Low alloy	FERROD 165A	E7024-1	E 42 2 RA 73	TÜV
	KRYO1/1P	E7018-G-H4R	E 50 6 Mn1Ni B 32 H5	ABS, LR, BV, DNV, TÜV, DB
	TENAX 35S	E7018-1 H4	E 42 5 B 32 H5	ABS, LR, BV, DNV, RINA, TÜV, DB
Stainless steel	TENAX 88S	E8016-G H4	E 50 6 Mn1Ni B 12 H5	ABS, LR, DNV
	AROSTA 304L	E308L-16	E 19 9 L R 12	BV, TÜV
	AROSTA 316L	E316L-16	E 19 12 3 L R 12	ABS, LR, BV, DNV, TÜV, DB
	AROSTA 309S	E309L-16	E 23 12 L R 32	ABS, BV, TÜV
Low chromium VI	29.9 SUPER R (LIMAROSTA 312)	E312-17	E 29 9 R 12	ABS, LR, BV, DNV, RMRS, TÜV, DB
	CLEARINOX E309L	E309L-17	E 23 12 L R 2 2	ABS, BV, DNV, TÜV
Duplex	CLEARINOX E316L	E316L-17	E 19 12 3 L R 2 2	ABS, BV, DNV, TÜV
	ULTRAMET™ 2205 (AROSTA® 4462)	E2209-16*	E 22 9 3 N L R 32	BV, DNV, TÜV
Nickel	NIMROD 625KS	ENiCrMo-3	E Ni 6625	BV, TÜV

WELDING CONSUMABLES SOLUTIONS

SAW



Enhanced corrosion protection



No need for pre-drying

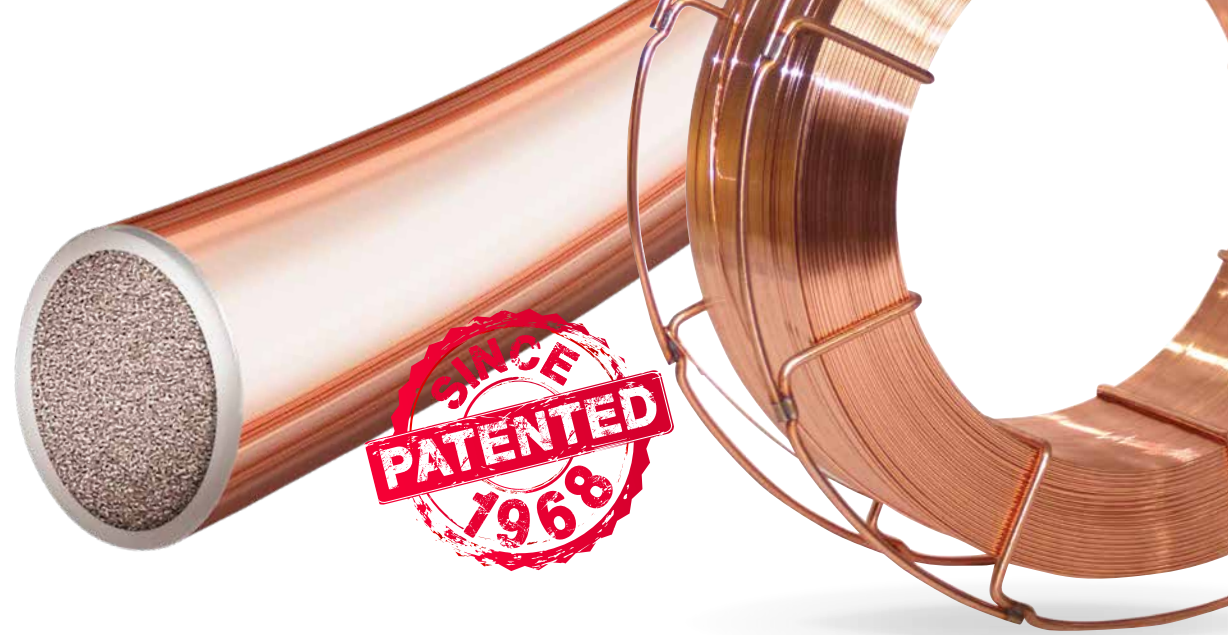
[Sahara ReadyBag only]



- Drums (300, 350, 400, 600, 1000 kg)
- Reel (300 kg)
- Drybag/ SRB for flux (25, 1000 kg)

WHY FLUXOFIL ?

- Manufactured from a solid tube, Copper coated with Improved electrical contact and reduced liner and tip wear
- Resistant against harsh storage conditions
- Outstanding wire feeding combined with stable arc
- Low hydrogen and reduced risk of coldcracking, delivering highest quality levels
- Excellent slag removal and regular bead appearance
- Superior welding productivity
- Preferred solution for long distance feeding, mechanisation and robotic, no seam to open on deformation, and wire placement accuracy due to straightness



50 YEARS* OF EXPERTISE
IN SEAMLESS
FLUX CORED WIRE
PRODUCTION

THE LATEST PRODUCTION TECHNOLOGY

New market requirements call for base materials and welding products delivering highest yield strengths and impacts at low temperatures.

Such demanding applications require **outstanding consistency of mechanical properties** combined with **superior welding performance and productivity**.

- **Best in class deposition rate** combined with exceptional arc stability and operability
- Very good results of **low temperature impact**. Alloying and micro-alloying elements are precisely selected and controlled during wire fill and rolling processes
- Consumable and flux **homogeneity**



**1968 - patent and production of the first seamless wires*



INDUSTRY CHALLENGES

Skills Shortage

- ▶ Automation
- ▶ Mechanization
- ▶ Robotics
- ▶ Leveraging ARC for customer training
- ▶ Virtual Welding

Global Competitiveness [Quality/Productivity]

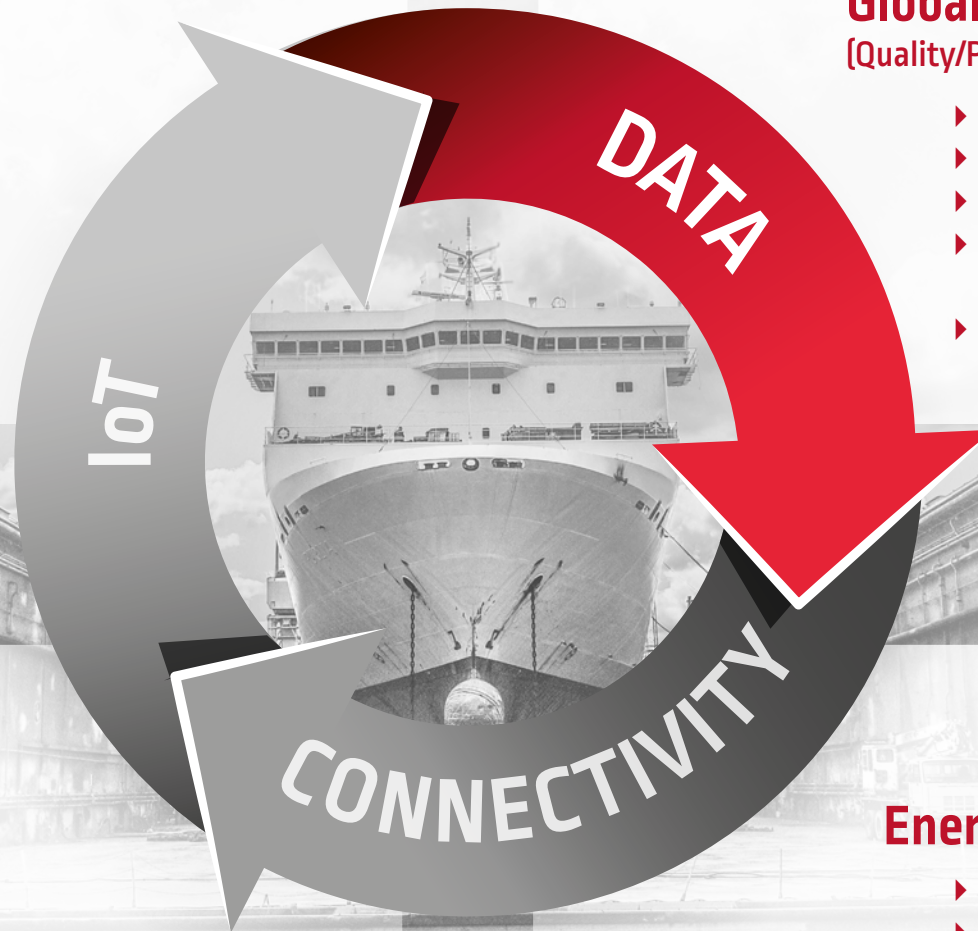
- ▶ Automation/Mechanization
- ▶ Increased Productivity
- ▶ Reduced Distortions
- ▶ Dedicated After Sales and Support
- ▶ Additive Manufacturing

Health and Safety

- ▶ Automation/Mechanisation
- ▶ PPE : PAPR
- ▶ Low Fume consumable range
- ▶ Fume extraction
- ▶ Ergonomics and Weight control <25 kg
- ▶ Cable management

Energy Cost

- ▶ Inverter Technology
- ▶ Data Collection
- ▶ Equipment monitoring



HYPERFILL®

ONE PROCESS
FOR ALL APPLICATIONS

STT®, FCAW, GMAW, RAPID ARC®

1F/1G/PA 2F/PB 3F/5G/PF,PG 4F/PD 2G/PC



TWO WIRES
A SINGLE ARC

GMAW PROCESS

Due to its innovative twin-wire design, HyperFill® is able to utilise two smaller diameter wires to produce a larger weld droplet and arc cone.

In return, this generates a large weld puddle that is easy to manage and control, allowing operators to increase deposition by an average of 50% over traditional single wire processes.

STT

HyperFill technology combined with the waveform benefits of STT will allow pipe manufacturers to take advantage of faster, more precise welding. The STT (surface tension transfer) waveform is primarily used on open root pipe welding, making it possible to increase root pass travel speeds up to 57% and delivering increased pipe diameter (inches/day). The combination of this waveform with the productivity gains of HyperFill will allow operators to see increased efficiencies throughout the welding process.

FCAW PROCESS

Thanks to a new high-performance contact tip, operators can use the HyperFill process in flux-cored applications for increased deposition rates up to 15lb/h. This solution also delivers the flexibility to weld in flat, horizontal, vertical-up, and overhead positions.

RAPIDARC®

HyperFill technology combined with RapidArc® waveform allows for tighter and more focused arcs with increased travel speeds of up to 58% compared to traditional CV or pulse single wire processes in automotive and heavy fabrication industries

ADVANCED SOLUTIONS

POWER WAVE® S500

When you are facing demanding production schedules, you need a welding power source you can rely on. The Power Wave® advanced welding platform delivers just that. From semiautomatic welding applications to complete robotic welding systems, the Power Wave® platform has you covered – day after day, shift after shift

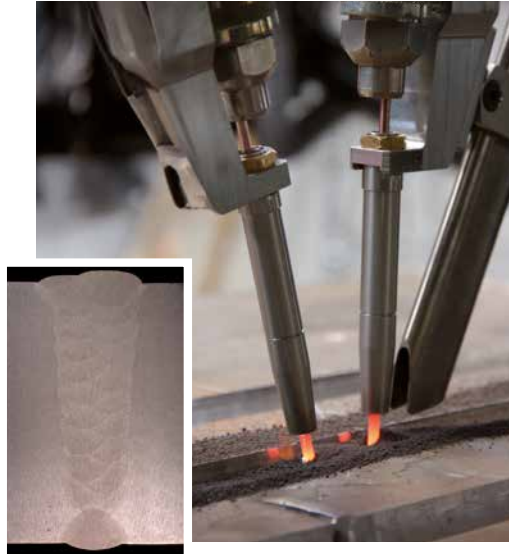


TWIN WIRE
SOLUTION ON A
SINGLE SETUP

AUTOMATION/MECHANIZATION SOLUTIONS

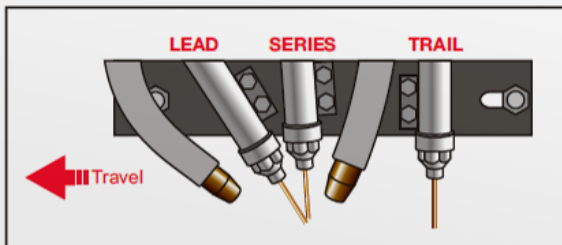
LONG STICK OUT PROCESS (LSO)

The long stick-out (LSO) is a highly efficient submerged arc welding process developed by Lincoln to maximize productivity. This technique leverages the natural resistivity of the welding wire. By significantly increasing the electrical stick-out, the wire is preheated, making it easier to melt. Consequently, for a given amperage, the deposition rate can be doubled compared to conventional stick-out procedures.



THE MODIFIED SERIES ARC™

The Modified Series Arc™ Welding process was developed to join plates from one side using an open gap. Modified Series Arc™ is different from conventional Tandem SAW because the lead and series electrodes are connected to the same power supply(s) and the electrodes intersect above the bottom of the joint.



Electrodes

The Lead, Series and Trail electrodes are located, as illustrated above.

To date, the Modified Series Arc™ process has been in use with a 3/16" (4.8 mm) dia. lead electrode and a 1/8" (3.2 mm) dia. series electrode. The purpose of the first two electrodes is to make a weld in the open gap that will have a good bead appearance on the bottom of the plate. A trail electrode is used to re-melt the top of the root pass, fill the remainder of the joint and produce a good looking bead on the top of the plate.

POWER WAVE® AC/DC 1000SD

Software-driven AC, DC positive or DC negative output allows for advanced control over deposition rate and penetration leading to increased weld speeds, consistently higher quality welds and improved efficiency in both single or multi-arc configuration



DC-1000

500 amp output connections enhance arc characteristics for low amperage submerged arc procedures. The single range control ensures precise output and easy operation. Its low profile case allows for installation under a workbench and stacking up to two machines, conserving valuable floor space



FLEXTEC 650 SUBARC

Delivers up to 815A of welding power, making it ideal for a wide range of applications, including construction, shipbuilding, and heavy fabrication. It operates on a broad spectrum of voltage inputs and is IP23 rated for outdoor use and storage. With extensive compatibility, the Flextec 650 Subarc works seamlessly with nearly any Lincoln Electric® SAW wire feeder and controller.



INROTECH'S ADVANCED AUTOMATED SOLUTIONS



Inrotech's welding automation systems are built on adaptive intelligence - a proprietary operational logic embedded in the company's self-developed software. This software seamlessly integrates with robots and welding power sources from various manufacturers.

Unlike traditional welding automation, which often relies on repetitive, simple programming for identical tasks, Inrotech offers advanced solutions tailored to complex environments. For instance, in shipyards where components and tolerances vary significantly, Inrotech's robotic welding systems, such as the Inrotech-Classic and Inrotech-MicroTwin, automatically identify weld requirements and assess tolerances. They calculate, in real time, critical parameters such as the number of weld passes needed. This adaptive and intelligent approach is what sets Inrotech's solutions apart from conventional systems.



INROTECH MICROTWIN



INROTECH CLASSIC



Shipbuilding Industry

Specifically designed for the welding of **micro panels, sub-assemblies and T-profiles** in the shipbuilding industry, however it can be used for a number of other purpose.



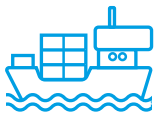
Sensologic Technology

Works fully automatic, push the "start" button; after completed scanning the **welding starts automatically**. It only takes a few minutes with a scanning speed of 36 sqm per minute.



User-friendly interface

The user-friendly interface gives you **full control over the robot** from one single touch screen, while providing accurate report from the process.



Shipbuilding Industry

This welding robot is intended for the welding of **open block assemblies** in the shipbuilding industry, yet this welding robot can be used for a number of other purposes.



Sensologic Technology

Once the object has been recognized, the **welding process commences automatically**. This continues until the entire panel is welded.



Two Simple Instructions

One operator is able to **handle six Inrotech-Classic** with Inrotech's intuitive user interface that does not require any robot programmer experience or knowledge.

PYTHON X CUTTING SOLUTIONS

PythonX Systems from Lincoln Electric® are the trusted international name in robotic fabrication systems. New machines and capabilities allow you to fabricate structural steel and pipe.

PythonX machines are versatile and complete solutions that automate your processing operations in your fabrication shop while providing you with increased productivity, unmatched cut quality, and predictable and consistent throughput. In addition, our signature simplicity of operation gives you the confidence to implement a new machine and start seeing a return on your investment immediately. PythonX machines deliver the solutions that you need to help your business where it counts the most . . . your bottom line.



COBOT SOLUTIONS



Easy User Interface

Step-by-step on-screen instructions allow operators to learn how to teach points and create a program fast.



Smart Torch

Smart Torch design provides an ergonomic grip for users to easily move the collaborative robotic arm. The integrated buttons allow users to program from the torch.



THE COOPER APP

The Cooper App includes presets based on wire size, type, gas mix, and thickness of material being welded and/or joined. The Weld By Numbers™ feature offers preset weld settings. Dozens of parameters are preset in these numbers, which correlate to the material thickness to optimize weld performance and quality.



ADDITIVE SOLUTIONS

Lincoln Electric Additive Solutions 3D metal printing services gives your business a big advantage over castings, forgings and other traditional manufacturing processes with the fast delivery of new and replacement parts and tooling. With the **largest 3D metal printing capacity in North America**, we can expedite production for large industrial parts for your application and industry.



- Making large parts quickly
- Faster turn-around time
- Reduction in lead times from months to weeks
- Faster prototype testing



- More design freedom
- Less waste, virtual inventory
- Complete finished part provider

7,000 m²
FOR LARGE FORMAT
PRINTING SYSTEMS

Approximate build volume: 1.2m x 1.5m x 2m
With positioner (more complex geometries):
up to 1,500kg and 1.5m high.
Off the floor: 3,600kg and 2.5m high

ADDITIVE MANUFACTURING



COMPLEX



Post Printing Machining & Fab

28+ years of
Aerospace and
Automotive machine
& fabrication



Metallurgy and Deposition Know-How

100+ years of arc welding
innovation



Feedstock Production

U.S. market share
leader with presence
in 18 countries



Automation Hardware & Robotics

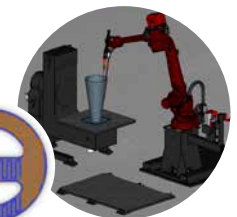
A pioneer in
robotic welding,
with largest-
part handling
capabilities in the
industry



18 Additive Systems 24/7 Production

Advanced Process Control & Software

Inventor of industry-
defining process control
and AM software-
SculptPrint™ OS



SOLUTIONS

MANUAL EQUIPMENT WELDING SOLUTIONS

SMAW/GTAW EQUIPMENT

SPRINTER 160S & 180S

Unmatched Power, Unparalleled Portability

- Experience high performance in a compact form. Weighing under 9kg, the Sprinter S is your lightweight, portable powerhouse. With an impressive 180A output, you can easily weld all types of electrodes (up to 4.0mm), including 7018 and 6010. But that's just the beginning. The Sprinter S isn't just a stick welder; it combines superior stick functionality with DC LIFT TIG mode and dual input voltage (120V/230V), giving you ultimate versatility

- DC Stick • DC Lift TIG



SQUARE WAVE® 400 ADV

Prime choice for industrial aluminum welding
Struggling with inconsistent weld quality and high energy costs? The SQUARE WAVE® 400 ADV addresses these issues by combining power and precision for superior welding results.

Tired of equipment failing in tough conditions? Its robust design ensures reliable performance in the most challenging environments. Plus, with the latest energy-saving technology, you can significantly reduce operational costs while boosting productivity.

- TIG (GTAW) • Pulsed TIG (GTAW-P) • Stick (SMAW) • Air carbon arc (CAC-A)
- Aluminum • Magnesium • Copper alloys • Steel • Stainless steel • Low alloy steel



LINC® i400S

The LINC i400S® is engineered with cutting-edge energy-saving technology, making it exceptionally suited for the most challenging environments. Its unique design incorporates advanced communication devices and digital transmission systems, enabling operators to effortlessly monitor and track welding operations. With a dedicated kit paralleling system, the LINC® i400S can deliver up to 800 A of output by utilizing two power sources simultaneously.

- MMA • Gouging • TIG lift
- MMA manual & Synergic Pulse
- Premium Cellulosic 6010 Stick capability

- Steel • Stainless steel • Low alloy steel



PLASMA CUTTING

TOMAHAWK® 30K

The Tomahawk® 30K plasma cutting system arrives ready to go for fast and precise cutting. With the 30K, forget the grinder – simply pick up the torch and cut in seconds.



MANUAL EQUIPMENT WELDING SOLUTIONS

MULTI-PROCESS EQUIPMENT

YARDTEC® 300C

Lightweight, portable multi-process **power source** with an integrated **wire feeder**, making it an ideal solution for shipyards and construction sites. This versatile product is perfect for customers who need to perform welding in large facilities, where moving equipment, extending its range, and working in hard-to-reach areas can be challenging.

- GMAW Manual and Synergic • FCAW Manual and Synergic
- SMAW • GTAW (Lift TIG) • Gouging (with 4mm electrode)
- Steel • Stainless steel • Aluminium



Compact case designed for harsh welding environments with limited access.

An ergonomically designed handle made for safe transport and handling - manually or crane-lifted by cable.

PORTABLE, LIGHTWEIGHT & SMALL SIZE



FLEXTEC® 350XP

Equipped with CrossLinc® technology, the Flextec 350XP can be controlled from hundreds of feet away without expensive and inconvenient control cables. Desert Duty® and IP23 rated, these welders can withstand harsh outdoor conditions and outperform other welders in their class.

LN-25X

CrossLinc® and True Voltage Technology™ (TVT™) helps you get the job done with drastically less movement

ACTIV8X®

Small enough to fit through manways and light enough to carry around the site

ACTIV8X® PIPE™

Features STT Field and Pulse waveform outputs



CROSSLINC® TECHNOLOGY

Output Control at the Arc, No Additional Cable CrossLinc feeders enable voltage control at the feeder without the extra cable. The result is greater productivity, safety, and quality. Avoid the negative aspects of across the arc models and adding a control cable, while enjoying all the benefits.



SAFETY AND PPE SOLUTIONS

MAKING FUME MANAGEMENT EASY

Lincoln Electric manufactures portable, stationary, and customized weld fume control solutions

- System Design: Environmental specialists offer custom designs for optimal circulation and air filtration
- Installation and Service: Experienced team installs arms, hoods, filter banks, and duct work on-site



DID YOU KNOW?

Lincoln Electric does it all!
We manufacture, design, install, and service all of our own weld fume control equipment.



RESPIRATORY PROTECTION

EuropurePLUS™ RANGE TH3 Class

Ergonomic and smart protection.
Fully integrated safety, with respiratory,
head, eye and skin protection options.
Designed to work together for maximum comfort.



**VERSATILE PROTECTION
WITH ADDED VALUE AND
MODULARITY!**

Superior Battery Life



EuropurePLUS™
5500 LS

MMA, MIG/MAG

GRINDING



EuropurePLUS™
LE FACE SHIELD

**GRINDING, BRAZING,
OXYFUEL CUTTING**



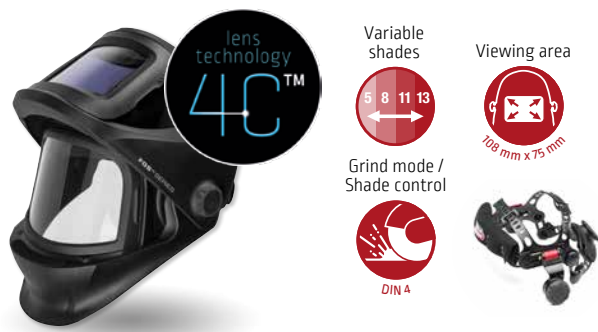
EuropurePLUS™
CLEAR

**GRINDING, BRAZING,
OXYFUEL CUTTING**



AUTODARKENING HELMETS

VIKING™ 3250D FGS™



VIKING™ 3350 SERIES



EUROWAVE 3.0 LS



LEATHER MASKS



LEATHER
HELMET
FLIP UP
WITH VARIABLE
SHADE



LEATHER
HELMET
FLIP UP
WITH SHADE 11



ACCESSORIES SOLUTIONS

CUTTING AND GRINDING DISCS

DUCTIFLEX PRO

Top quality cutting disks for professional use.



DUCTIFLEX

A grinding range for standard structural steel.



DUCTIFLAP

Abrasive flap disks. These disks are made by cutting abrasive fabrics, then cutting as flaps and bonding them on a fiberglass or nylon backing plate by an adhesive.



GOUGING ELECTRODES



CARBONAIR

Pointed electrodes

Versatile multi-purpose round gouging electrodes *(most popular type)*



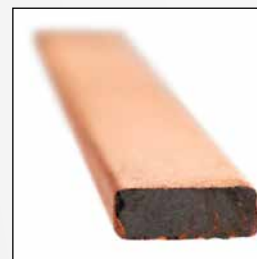
Hollow electrodes

Versatile multi-purpose round gouging electrodes



Flat electrodes

Rectangle shape for close tolerance metal removal and/or to create rectangle grooves.



CARBONAIR PLUS

Jointed electrodes

Round electrodes with male and female ends to eliminate stub loss



ACCESSORIES SOLUTIONS

GAS AND FLAME



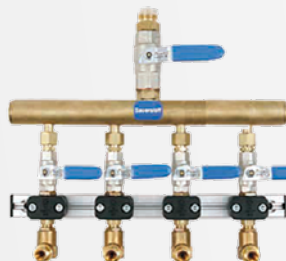
GAS REDUCERS

Complete line of industrial pressure regulator products designed to perform in critical applications.



GAS DISTRIBUTORS

Extensive line of gas delivery systems for industrial and specialty gas applications.



FLAME STRAIGHTENING TORCH

Wide variety of torch products that will meet the needs of most fabricators.



CERAMIC BACKINGS

KERALINE RANGE

How to improve the process and increase productivity [DCR]?



Avoid welding both sides of the metal part

NOT NECESSARY TO TURN THE METAL PARTS



Save filler metal

REDUCES OVERHANG

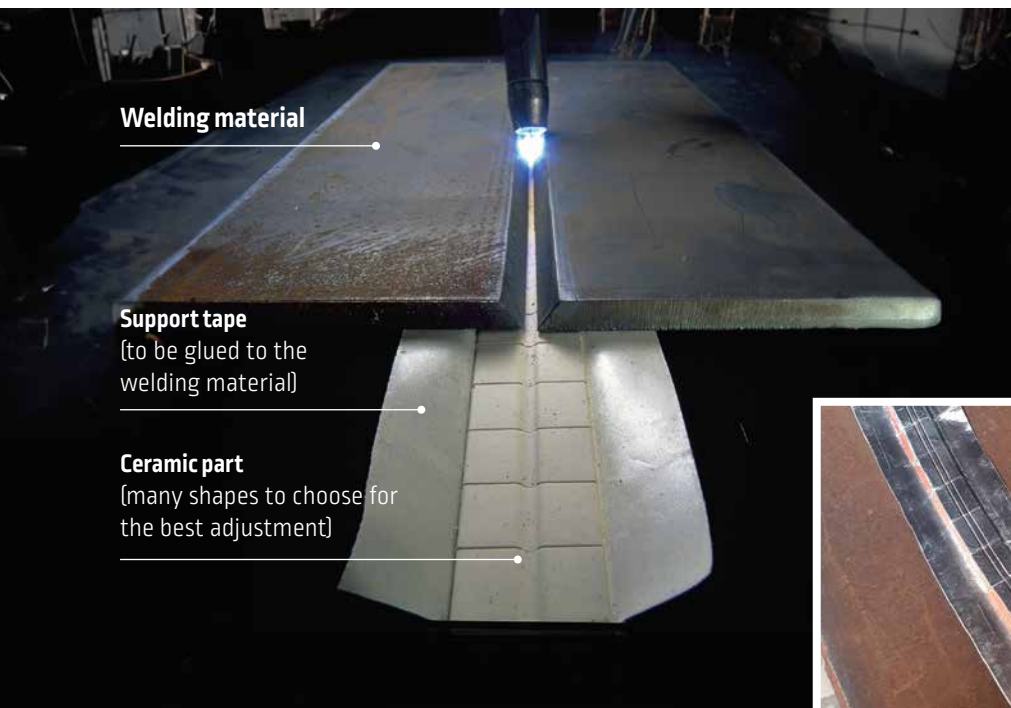




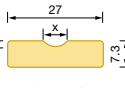

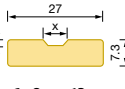

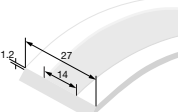

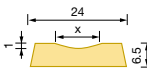

Nice appearance of the root pass

CURVED OR FLAT



OUR KERALINE IS NOT SENSITIVE TO AMBIENT TEMPERATURE VARIATIONS



Type	Dimensions [mm]	3D diagram	Application	Process
Cylindrical / round type				
TR	 d = 6, 7, 8, 9, 12 or 15 mm		Medium to heavy thickness. V- or X-grooves for identical or dissimilar thickness	GMAW, FCAW, SMAW
Flat with rounded concave groove				
TA	 x = 6, 9 or 13 mm		Medium to heavy thickness	Metal cored or solid wire without slag
Flat with square concave groove				
TF	 x = 6, 9 or 13 mm		Same thickness, medium or thick	Cored wire with slag, MIG MAG, V-bevel
Circular ceramic backings				
RAD				
Flat with rounded concave groove				
TM	 x = 13 or 18 mm			

Keraline support type:

Ceramic on aluminum-tape

Articulated, Flexible following the parts geometry, adjustable, heat resistant, easily detachable after welding.

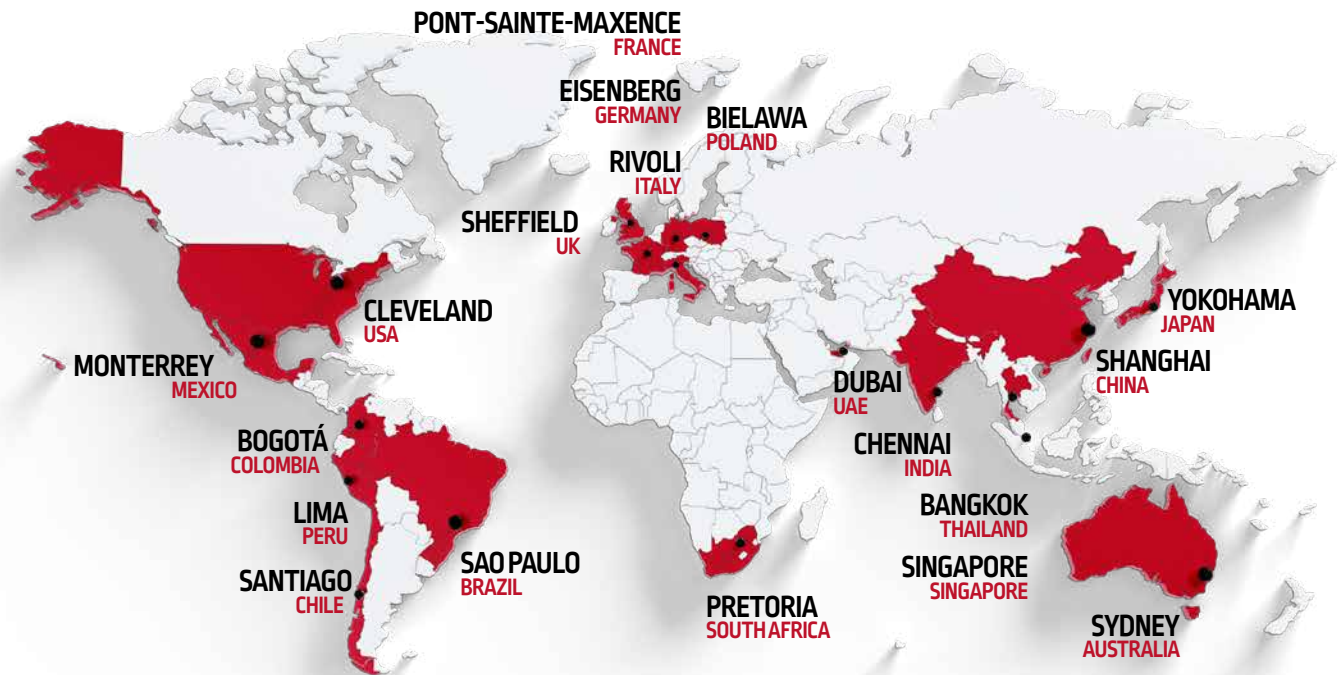
Ceramic on metallic support

Quick implementation, easily positioned, adjustable, heat resistant.



Application Resource Centers, or ARC facilities, feature Lincoln Electric's newest technologies and experts who develop and deliver productivity solutions.

These centers provide dedicated spaces and equipment for demonstrating and testing welding, cutting, virtual welding, and automation solutions. Each ARC also includes classrooms for training on available processes, machines, and products to develop and conquer any shipbuilding needs, along side dedicated application experts who assist customers with welding problems, procedures, and more.





CUSTOMER ASSISTANCE POLICY

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