STICK WELDING RANGE

INVERTEC® 150S / 170S / 160SX / 165S / 165SX / V270 S 2V / 270SX / 400SX
LINC 405-S / 405-SA / 406 / 635-S / 635-SA
HOT ROD 500S

www.lincolnelectric.eu
MMA PROCESS

In this welding process, an electric arc is created between a coated consumable electrode and the workpiece to be welded, causing the parent material to fuse and the electrode to melt. The electrode is of a similar material to the parent material, and melting both together provides the weld (or joint) with a reinforcing filler material. The electrode has a flux coating of either basic, rutile or cellulose type. As the coating burns, it protects the arc and weld pool from the surrounding atmosphere with a gaseous shroud. The slag which solidifies over the newly deposited weld also protects it from the atmosphere while cooling.

Features:

- **Arc Force**
  This prevents the electrode from sticking during welding. Arc force is a temporary increase of the output current during welding when the arc is too short. This feature supports production with consistently excellent arc performance. It also enhances simple position welding, making the job easier. In order to achieve an outstanding weld performance on a variety of electrodes (Rutile, Basic or Cellulose), the Arc Force can be finely adjusted with a simple knob. To have a smooth arc with fewer spatters, set the knob to minimum (Rutile, Basic). For a crisper arc, with more penetration, set it to maximum.

- **Hot Start**
  This is a temporary increase of the output current [0,5s] during the start of a weld, which helps ignite the arc quickly and reliably. Hot Start provides excellent arc ignition avoiding the electrode sticking and any metallurgical default in the weld.

- **Anti-sticking**
  This electronic device minimizes the short circuit current in the event of the electrode sticking to the workpiece for a prolonged period. If a short circuit does occur, it will be easy to remove the electrode from the workpiece, and the electrode gun and cable will remain undamaged. It also serves as a safety device while protecting the operator.

- **AIR ARC GOUGING**
  An industrial stick welder with adequate power and voltage load can be used to cut and remove surfaces. This includes cutting grooves and removing cracks from steel, cast iron and copper alloys. This process is known as Air Carbon Arc Cutting or ARC AIR gouging. It makes use of a special electrode gun which directs a violent jet of compressed air on the electric arc area, removing the molten material. The electrode consists of compressed graphite and alloys with copper coating.
### Inverter Range

<table>
<thead>
<tr>
<th>Product</th>
<th>Reference</th>
<th>Voltage (V)</th>
<th>Frequency (Hz)</th>
<th>Phase</th>
<th>Fuse Size (A) (slow)</th>
<th>No-load Voltage Display</th>
<th>PFC</th>
<th>Current Range DC (A)</th>
<th>Electrode Diameter (mm)</th>
<th>Warranty (Years)</th>
<th>Weight (kg)</th>
<th>Rated Output Voltage</th>
<th>Protection Class</th>
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<tr>
<td>Invertec® 150S</td>
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<td>50 / 60</td>
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<td>17</td>
<td>45</td>
<td></td>
<td>10-140</td>
<td>3,2</td>
<td>2</td>
<td>6,7</td>
<td>140A / 25.6V@25%</td>
<td>IP23 / F</td>
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<td>7</td>
<td>160A / 26.4V@20%</td>
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<tr>
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<td>5-160</td>
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<td>5-160</td>
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<td>IP23 / H</td>
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<tr>
<td>Invertec® V270 S 2V</td>
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<td>50 / 60</td>
<td>3</td>
<td>35 / 20</td>
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<td>5-270</td>
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<td>2</td>
<td>13,5</td>
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<td>5-400</td>
<td>6,3</td>
<td>3</td>
<td>36</td>
<td>400A @36V@35% / 300A @28V@100%</td>
<td>IP23 / H</td>
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### Conventional Range

<table>
<thead>
<tr>
<th>Product</th>
<th>Reference</th>
<th>Voltage (V)</th>
<th>Frequency (Hz)</th>
<th>Phase</th>
<th>Fuse Size (A) / Electrode Diameter (mm)</th>
<th>No-load Voltage Display</th>
<th>PFC</th>
<th>Current Range DC (A)</th>
<th>Electrode Diameter (mm)</th>
<th>Warranty (Years)</th>
<th>Weight (kg)</th>
<th>Rated Output Voltage</th>
<th>Protection Class</th>
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<tbody>
<tr>
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<td>230</td>
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<td>63 / 40 / 78</td>
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<td>50 / 60</td>
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<td>63 / 40 / 32</td>
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<td>63 / 40 / 32</td>
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<td>100 / 63</td>
<td>50-625</td>
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<td>203</td>
<td>600A @44V@35% / 375A @35V@100%</td>
<td>IP23 / H</td>
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<tr>
<td>LINC 635-SA</td>
<td>K14038-1</td>
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<td>63</td>
<td>50-625</td>
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<td>600A @44V@35% / 375A @35V@100%</td>
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<td>600A @44V@35% / 375A @35V@100%</td>
<td>IP23 / H</td>
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INVERTEC® 150S
Small, powerful and robust
- Robust design – Unique rubber corners, metal housing and push control buttons to withstand tough environmental conditions.
- Premium arc – Advanced Lincoln technology and knowhow guarantee performance every time.
- Power Surplus – Additional power for superior arc control.
- Soft and Crisp mode – Selectable arc modes for different electrode types.
- Auto Adaptive Arc Force – For stable arc with low spatter levels as standard.

PRODUCT
Reference: K12034-1
Input cable (2 m)
Suitcase with cables
Shield
Brush

Processes
Stick, Lift TIG
Applications
• Small maintenance
• Light construction
• Light metal fabrication
• Repair on site
• Outside and workshop welding jobs
• Hobby

INVERTEC® 170S
Small, powerful and robust
- Robust design – Unique rubber corners, metal housing and push control buttons to withstand tough environmental conditions.
- Premium arc – Advanced Lincoln technology and knowhow guarantee performance every time.
- Power Surplus – Additional power for superior arc control.
- Soft and Crisp mode – Selectable arc modes for different electrode types.
- Auto Adaptive Arc Force – For a stable arc with low spatter levels as standard.

PRODUCT
Reference: K12035-1
Input cable (2 m)
Suitcase with cables
Shield
Hammer
Brush

Processes
Stick, Lift TIG
Applications
• Small maintenance
• Light construction
• Light metal fabrication
• Repair on site
• Outside and workshop welding jobs

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<tbody>
<tr>
<td>Invertec® 150S</td>
<td>K12034-1</td>
<td>230V / 1Ph</td>
<td>140A / 25,6V@25%</td>
<td>10-140</td>
<td>17</td>
<td>6,7</td>
<td>244 x 148 x 365</td>
<td>IP23 / F</td>
</tr>
<tr>
<td>Invertec® 150S Pack ready to weld</td>
<td>K12034-1-P</td>
<td></td>
<td>80A / 25,6V@100%</td>
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<tr>
<td>Invertec® 170S</td>
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<td>160A / 26,4V@20%</td>
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<td>23</td>
<td>7</td>
<td>244 x 148 x 365</td>
<td>IP23 / F</td>
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<tr>
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<td>80A / 24,0V@100%</td>
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</table>
**INVERTEC® 160SX**

**Professional Performance Industrial Innovation**

- More Power: 30% more output current with the same input current allows welding with up to 4.0mm electrode from a 16A input.
- Portable Everywhere: Lightweight, easy to handle; able to operate with up to 100m mains extension cables and suitable to use with a generator.
- Robust Design, Industrial Use: Electrical safety (IP23), potted PC boards and optimum airflow reduces contamination to extend the equipment’s lifespan in the harshest environmental conditions.
- Excellent Welding Experience: Good arc ignition with a smooth stable arc, Soft and Crisp mode, Auto Adaptive Arc Force — an optimal choice for welding with every type of electrode.
- Cellulosic Capability: No electrode is too difficult to weld with. Suitable for small diameter pipe welding.

**Product Information**

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<tbody>
<tr>
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<td>K12050-1</td>
<td>115 / 230V / 1Ph PFC</td>
<td>160A / 24V*15%<em>100A / 26.4V</em>100%</td>
<td>5-160</td>
<td>16</td>
<td>9</td>
<td>389 x 247 x 489</td>
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<tr>
<td>Invertec® 165S</td>
<td>K14171-1</td>
<td>230V / 1Ph</td>
<td>160A@20% / 160A@30% / 100A@60% / 140A@60%</td>
<td>5-160 / 10-160</td>
<td>7</td>
<td>7</td>
<td>265 x 162 x 385</td>
<td>IP23</td>
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<tr>
<td>Invertec® 165SX</td>
<td>K14170-1</td>
<td>230V / 1Ph</td>
<td>160A@20% / 160A@30% / 100A@60% / 140A@60%</td>
<td>5-160 / 10-160</td>
<td>7</td>
<td>7</td>
<td>265 x 162 x 385</td>
<td>IP23</td>
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</table>

**INVERTEC® 165S & 165SX**

**Professional performance, industrial perfection**

- Exceptional performance: high duty cycle at 40 °C.
- Easy to use: Hot Start function to improve the arc striking and Arc Force function to avoid electrode sticking.
- Versatile: welding with any coated electrode (except cellulosic) and Lift TIG (165SX).
- Compatible with motor-generators.
- Power Factor Correction (PFC) for 165SX. PFC delivers low current consumption, energy saving, low current harmonics and the reduction of the total CO₂ produced by the welding process.
- Lightweight: less than 9 kg.
- Handy: thanks to the handy carrying strap.

**Unit Includes**

- Input cable (2 m)
INVERTEC® V270 S 2V

Powerful portability, robust reliability
- Smart switching 230 / 400V three phase.
- Excellent arc characteristics.
- Maximum output of 270 amps allows the use of electrodes up to 6.0 mm.
- Excellent rutile, basic and cellulosic stick welding performance.
- Adjustable "Arc Force" and "Hot Start" as standard.

INVERTEC® 270SX & 400SX

Professional welder built for tough working conditions
- Robust, built for heavy environmental conditions.
- Fully featured and user-friendly control panel with digital display allows precise setting of welding current.
- Soft and Crisp multiple arc modes for different electrode types.
- Adjustable Hot Start and Arc Force allow a smooth start / restart of the electrode and prevent sticking of the electrode in the weld pool.

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<table>
<thead>
<tr>
<th>Product</th>
<th>Reference</th>
<th>Primary Voltage [50-60Hz]</th>
<th>Rated Output (A)</th>
<th>Output Range (A)</th>
<th>Fuse Size (A)</th>
<th>Weight (kg)</th>
<th>Dimensions H x W x D (mm)</th>
<th>Protection Class</th>
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<td>K12022-3</td>
<td>230 / 400V / 3Ph</td>
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<td>35 / 20</td>
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COSNISTENCY – the same control of the entire range

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<tr>
<th>Feature</th>
<th>LINC-405S</th>
<th>LINC-405SA</th>
<th>LINC-406</th>
<th>LINC-635S</th>
<th>LINC-635SA</th>
<th>HOT ROD 500S</th>
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<td>preset</td>
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<td>preset</td>
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<tr>
<td>Arc Force Control (Potentiometer)</td>
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<td>preset</td>
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<td>optional KIT</td>
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<tr>
<td>V meter</td>
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### LINC® 405-S & SA

**The rugged and distinguished workhorses**

- Rugged, conventional rectifier with excellent arc characteristics.
- Capable of welding with Rutile, Basic and Cellulosic electrodes.
- Arc gouging capability.
- Easy-to-understand, graphic control panels.
- Ready to be moved. Equipped with wheels, pull bar and two lifting hooks.

#### Input

- **Primary Voltage**
  - 230 / 400V / 3Ph

#### Output

- **Rated Output (A)**
  - 400A / 36V@35%
  - 240A / 29V@100%

- **Output Range (A)**
  - 15-400

- **Fuse Size (A) (slow)**
  - 63 / 40

- **Weight (kg)**
  - 126

- **Dimensions (H x W x D mm)**
  - 640 x 580 x 700

- **Protection Class**
  - IP23 / H

#### Applications

- Stick, EL cellulose, Gouging

#### Processes

- Pipeline construction
- Heavy industrial fabrication
- Plant construction
- Pressure vessels
- Nuclear power station
- Shipbuilding
- Hardfacing
- Process industry
- Arc-Air gouging

#### Unit Includes

- Input cable (5 m)

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### LINC® 406

**The rugged and distinguished workhorse**

- Rugged, conventional welding rectifier with excellent arc characteristics.
- Capable of welding with Rutile, Basic and Cellulosic electrodes.
- Arc gouging capability.
- Hot Start supporting excellent arc starting.
- Arc Force to prevent sticking of the electrode in the welding pool.

#### Input

- **Primary Voltage**
  - 220 / 380 / 440V / 3Ph

#### Output

- **Rated Output (A)**
  - 400A / 36V@35%
  - 240A / 29V@100%

- **Output Range (A)**
  - 40-400

- **Fuse Size (A) (slow)**
  - 63 / 40 / 32

- **Weight (kg)**
  - 135

- **Dimensions (H x W x D mm)**
  - 650 x 580 x 690

- **Protection Class**
  - IP23 / H

#### Applications

- Pipeline construction
- Heavy industrial fabrication
- Plant construction
- Pressure vessels
- Nuclear power station
- Shipbuilding
- Hardfacing
- Process industry
- Arc-Air gouging

#### Processes

- Stick, EL cellulose, Gouging

#### Unit Includes

- Input cable (5 m)
LINC® 635-S & SA

The rugged and distinguished workhorses
- Rugged, conventional welding rectifier with excellent arc characteristics.
- Capable of welding with Rutile, Basic and Cellulosic electrodes.
- Arc gouging capability.
- Easy-to-understand, graphic control panels.
- Ready to be moved. Equipped with wheels, pull bar and two lifting hooks.

HOT ROD 500S

The tough and powerful professional welder
- Excellent arc characteristics for a wide range of electrode types.
- Maximum output of 625A allows the use of electrodes up to 6.3 mm and air carbon gouging with 8mm electrodes.
- Desert rating operating temperature of up to 55°C.
- Stackable case design with built-in hook. Easy storage and handling.

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<td>415V / 3Ph</td>
<td>600A / 44V@35%</td>
<td>50-625</td>
<td>63</td>
<td>203</td>
<td>795 x 566 x 813</td>
<td>IP23 / H</td>
</tr>
</tbody>
</table>
## STICK ELECTRODES

### MILD STEEL STICK ELECTRODES

**OMNIA® 46**
AWS A5.1: E6013
ISO 2560-A: E 38 0 R 11
AC / DC -

- Applicable for “clean” structural steel.
- Smaller dimensions – excellent for hobbyists.
- Very suitable for low open circuit voltage transformers (min. OCV 42 V).

#### RUTILE (6013)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ø (mm)</th>
<th>Length (mm)</th>
<th>Quantity per pack</th>
<th>kg per pack</th>
<th>Item Number</th>
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<tbody>
<tr>
<td>OMNIA® 46</td>
<td>2,0</td>
<td>300</td>
<td>480</td>
<td>4,2</td>
<td>609059</td>
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<tr>
<td></td>
<td>2,5</td>
<td>350</td>
<td>263</td>
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<td>609060</td>
</tr>
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<td>181</td>
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<td>609061</td>
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<td>450</td>
<td>154</td>
<td>6,2</td>
<td>609062</td>
</tr>
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<td>4,0</td>
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<td>111</td>
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<td>58</td>
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</tr>
</tbody>
</table>

### LINCOLN® 7016DR
AWS A5.1: E7016-H8
ISO 2560-A: E 38 3 B 1 2 H10
AC / DC +

- Easy ignition, easy to restart – to restrike arc.
- Much easier vertical up vs basic electrode.
- Soft arc fusion, extremely good weldability.
- Few spatters, no need to rework, no sticking.
- Easier to weld especially with poor joint preparation.

#### BASIC (7018)

Double Coated Electrode

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ø (mm)</th>
<th>Length (mm)</th>
<th>Quantity per pack</th>
<th>kg per pack</th>
<th>Item Number</th>
</tr>
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<tbody>
<tr>
<td>LINCOLN® 7016 DR</td>
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<td>600</td>
<td>3,9</td>
<td>629275</td>
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<td>450</td>
<td>375</td>
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<td>629276</td>
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<td></td>
<td>4,0</td>
<td>450</td>
<td>240</td>
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</table>

### CONARC® 49
AWS A5.1: E7018 H4
ISO 2560-A: E 46 3 B 42 H5
DC +

- Universal basic electrode, most suitable for shipbuilding and light general construction work.
- Almost no spatter, nice wetting and full weld pool control.
- Perfect welding and 120% recovery contribute to high productivity.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ø (mm)</th>
<th>Length (mm)</th>
<th>Quantity per pack</th>
<th>kg per pack</th>
<th>Item Number</th>
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</tr>
</tbody>
</table>

### MILD STEEL STICK ELECTRODES

**LINCOLN® 7018-1**
AWS A5.1: E7018-1 H4R
ISO 2560-A: E 46 5 B 3 2 H5
AC / DC +

- Excellent for general purpose welding.
- Good impact values: down to -50°C.

#### BASIC (7018-1)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ø (mm)</th>
<th>Length (mm)</th>
<th>Quantity per pack</th>
<th>kg per pack</th>
<th>Item Number</th>
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<tbody>
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</table>

### STAINLESS STEEL STICK ELECTRODES

**LIMAROSTA® 304L**
AWS A5.4: E308L-17
ISO 3581-A: E 19 9 L 1 2
AC / DC + / -

- Mirror-like bead appearance.
- Self-releasing slag.
- Good side wall fusion, no undercut.

#### 304L / 308L

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ø (mm)</th>
<th>Length (mm)</th>
<th>Quantity per pack</th>
<th>kg per pack</th>
<th>Item Number</th>
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<tbody>
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<td>557312</td>
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<td>135</td>
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<td>450</td>
<td>55</td>
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</table>

### LIMAROSTA® 316L
AWS A5.4: E316L-17
ISO 3581-A: E 19 12 L 1 2
AC / DC + / -

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

#### 316L

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ø (mm)</th>
<th>Length (mm)</th>
<th>Quantity per pack</th>
<th>kg per pack</th>
<th>Item Number</th>
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<tbody>
<tr>
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<td>5,9</td>
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<td>95</td>
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<td>557503</td>
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</table>
STAINLESS STEEL STICK ELECTRODES WITH LOW CR(VI) EMISSION RATE

CLEAROSTA E 304L
AWS A5.4: E308L-17
ISO 3581-A: E 19 9 L R 22
DC+

304L / 308L
Double Coated Electrode

- High operator appeal and control due to the more stable and focused arc transfer.
- Reduced welding fumes (up to ~40%) and lower hexavalent Cr content (up to ~60%); improved working environment for all workers in the workshop.
- Suitable for root pass.
- Lower porosity, good striking and restriking, excellent slag removal.

CLEAROSTA E 316L
AWS A5.4: E316L-17
ISO 3581-A: E 29 9 R 12
AC / DC +

316L
Double Coated Electrode

Also available in Sahara ReadyPack® – the best vacuum pack.

STICK ELECTRODES FOR REPAIR

REPTEC CAST 31
AWS A5.16: ENiFe-CI
ISO 1071: E C NiFe-C1 1
AC / DC -

- Electrode for repair welding of cast iron, malleable cast iron and cast iron to steel.
- The nickel-iron weld deposit is easily machinable.
- Particularly applicable for nodular cast iron.
- Hardness weld deposit ~ 180 HB.
- Excellent current-carrying capacity due to bi-metal core wire.

GOUGING ELECTRODES

CARBONAIR
Pointed electrodes

CARBONAIR PLUS
Jointed electrodes (no stub loss)

STAINLESS STEEL STICK ELECTRODES FOR STEELS DIFFICULT TO WELD

LIMAROSTA® 312
AWS A5.4: E312-17
ISO 3581-A: E 29 9 R 12
AC / DC +

312
Also available in Sahara ReadyPack® – the best vacuum pack.

CAUTION: before use, carefully read and understand the safety datasheet available on our websites.

www.lincolnelectric.eu
ADVANTAGES OF ELECTRODE WELDING

- Easy to handle.
- Suitable to weld all types of metals.
- Universal — can be used anywhere, any time.
- The best choice for outdoor activities — welding with gas won’t produce good results in windy conditions.
- Delivering quality welding and decent mechanical properties.
- Easy to learn.
- Relatively quiet.
- Inexpensive to procure.
- Insensible to contamination, such as rust, oil or grease.

HEAVY APPLICATIONS

Applications
- Pipeline
- Shipbuilding
- Heavy fabrication
- Hardfacing
- Plant construction
- Process industry
- Pressure vessels
- Air-Arc gouging
- Nuclear power station

Applied material
- Steel
- Stainless steel
- Limited Aluminium
- Large thickness plates

PRODUCT APPLICATION CHART

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>HOT ROD 500S / LINC 630</th>
<th>Ø 8,0</th>
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</thead>
<tbody>
<tr>
<td>12 and up</td>
<td>Ø 8,0</td>
<td>Ø 6,0-6,3</td>
</tr>
<tr>
<td>8 and up</td>
<td>Ø 6,0-6,3</td>
<td>Ø 5,0</td>
</tr>
<tr>
<td>6 and up</td>
<td>Ø 5,0</td>
<td>Ø 4,0</td>
</tr>
<tr>
<td>3 and up</td>
<td>Ø 4,0</td>
<td>Ø 3,2</td>
</tr>
<tr>
<td>2-4</td>
<td>Ø 3,2</td>
<td>Ø 2,5</td>
</tr>
<tr>
<td>1.5-2.5</td>
<td>Ø 2,5</td>
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</tr>
<tr>
<td>1.0-1.5</td>
<td>Ø 2,0</td>
<td>Ø 1,6-1,75</td>
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</table>

Current (A)

0 50 100 150 200 250 300 350 400 450 500 550

Stainless Steel
High recovery
Arc gouge
## ACCESSORIES

<table>
<thead>
<tr>
<th>Kit</th>
<th>Description</th>
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<tbody>
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<td>KIT 25C25</td>
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<td>W000011138</td>
</tr>
<tr>
<td>KIT 25C50</td>
<td></td>
<td>W000250684</td>
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<tr>
<td>KIT 35C50</td>
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<td>W000011139</td>
</tr>
<tr>
<td>KIT 50C50+</td>
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<td>W000260682</td>
</tr>
<tr>
<td>TIG welding torch WTT2 17V – 135A – 4 m, valve, conn. 9 mm</td>
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<td>W000278880</td>
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<td>TIG welding torch WTT2 17V – 135A – 4 m, valve, conn. 13 mm</td>
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<td>W10529-17-4V</td>
</tr>
<tr>
<td>Remote control, 15 m</td>
<td></td>
<td>K10095-1-15M</td>
</tr>
<tr>
<td>Extension cable for remote control box, 15 m</td>
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<td>K10398</td>
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<tr>
<td>2-wheeled cart</td>
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<td>W0200002</td>
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<tr>
<td>4-wheeled undercarriage</td>
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<td>K2694-1</td>
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<tr>
<td>Ground cable 400A – 70 mm² – 5 / 10 / 15 m</td>
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<td>GRD-400A-70-xM</td>
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<tr>
<td>Ground cable 600A – 95 mm² – 10 m</td>
<td></td>
<td>GRD-600A-95-10M</td>
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<td>Electrode holder – 400A – 70 mm² – 5 / 10 m</td>
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<td>E / H-400A-70-xM</td>
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<td>Cable Extensión</td>
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<td>EXT-70-10M</td>
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<tr>
<td>Flair® 600 / 1600 gouging torch</td>
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<td>W000010136</td>
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<tr>
<td>48V AC socket (1500W) kit</td>
<td></td>
<td>K14092-1</td>
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<tr>
<td>A/V meter kit</td>
<td></td>
<td>K14090-1</td>
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<td>Adapter M14/DINSa</td>
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**TIG WELDING TORCH WTT2 17V**
- W000278880
- W000278876
- W10529-17-4V
- W000278885

**FLAIR® 600 / 1600**
- W000010136
- W000010118

**GROUND CABLE**
- GRD-400A-70-XM

**CABLE KITS**
- W000011138
- W000260683
- W000260684
- W000010139
- W000260681
- W000260682

**REMOTE CONTROL**
- K10095-1-15M

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[www.lincolnelectric.eu](http://www.lincolnelectric.eu)
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