

## Dual Shield II 101-TC

Dual Shield II 101-TC is an all-position flux cored electrode developed to meet the U.S. Navy qualification tests for hydrogen levels of less than 0.05 ml/g of deposited weld metal. This unique formulation designed for CO<sub>2</sub> shielding optimizes performance and reduces post-weld cleanup cost. Dual Shield II 101-TC produces exceptional mechanical properties and low temperature impact toughness. It is intended for use on HY-80, ASTM A710, A514, and A517 or other similar HSLA steels.

|                        |  |
|------------------------|--|
| <b>Classifications</b> | AWS A5.29 : E91T1-K2C-H4<br>AWS A5.36 : E91T1-C1A6-K2-H4<br>ASME SFA 5.36<br>ASME SFA 5.29 |
| <b>Approvals</b>       | DNV-GL<br>QPL-24403/2 MIL-101TC  |
| <b>Industry</b>        | Industrial and General Fabrication<br>Mobile Equipment<br>Ship/Barge Building              |

Approvals are based on factory location. Please contact ESAB for more information.

### Typical Tensile Properties

| Condition  | Yield Strength   | Tensile Strength  | Elongation |
|--|------------------|-------------------|------------|
| <b>100% CO<sub>2</sub></b>                                 |                  |                   |            |
| As Welded<br>(AWS A5.29 Requirement Flat Mild Steel Plate) | 600 MPa (87 ksi) | 640 MPa (94 ksi)  | 25 %       |
| As Welded<br>(MIL-E-24403/2 Vertical-Up HY-80 Base Plate)  | 640 MPa (93 ksi) | 710 MPa (103 ksi) | 23 %       |

### Typical Charpy V-Notch Properties

| Condition                  | Testing Temperature | Impact Value     |
|----------------------------|---------------------|------------------|
| <b>100% CO<sub>2</sub></b> |                     |                  |
| As Welded                  | -18 °C (0 °F)       | 104 J (77 ft-lb) |
| As Welded                  | -51 °C (-60 °F)     | 58 J (43 ft-lb)  |

### Typical Weld Metal Analysis %

| C    | Mn   | Si   | S    | P     | Ni   |
|------|------|------|------|-------|------|
| 0.03 | 1.32 | 0.35 | 0.01 | 0.014 | 1.64 |

### Deposition Data

| Diameter                   | Current | Voltage | Wire Feed Speed              | Deposition Rate         | Deposition Efficiency % |
|----------------------------|---------|---------|------------------------------|-------------------------|-------------------------|
| <b>100% CO<sub>2</sub></b> |         |         |                              |                         |                         |
| 1.2 mm<br>(.045 in.)       | 150 A   | 28 V    | 508 cm/min<br>(200 in./min)  | 1.9 kg/h<br>(4.2 lb/h)  | 86 %                    |
| 1.2 mm<br>(.045 in.)       | 210 A   | 29 V    | 762 cm/min<br>(300 in./min)  | 2.8 kg/h<br>(6.3 lb/h)  | 86 %                    |
| 1.2 mm<br>(.045 in.)       | 250 A   | 30 V    | 1016 cm/min<br>(400 in./min) | 3.9 kg/h<br>(8.5 lb/h)  | 87 %                    |
| 1.2 mm<br>(.045 in.)       | 290 A   | 33 V    | 1270 cm/min<br>(500 in./min) | 4.8 kg/h<br>(10.7 lb/h) | 87 %                    |
| 1.4 mm<br>(.052 in.)       | 155 A   | 25 V    | 381 cm/min<br>(150 in./min)  | 2.0 kg/h<br>(4.4 lb/h)  | 87 %                    |
| 1.4 mm<br>(.052 in.)       | 245 A   | 28 V    | 635 cm/min<br>(250 in./min)  | 3.3 kg/h<br>(7.3 lb/h)  | 86 %                    |
| 1.4 mm<br>(.052 in.)       | 310 A   | 33 V    | 889 cm/min<br>(350 in./min)  | 4.6 kg/h<br>(10.2 lb/h) | 85 %                    |
| 1.4 mm<br>(.052 in.)       | 360 A   | 36 V    | 1143 cm/min<br>(450 in./min) | 6.0 kg/h<br>(13.3 lb/h) | 85 %                    |
| 1.6 mm<br>(1/16 in.)       | 190 A   | 27 V    | 38 cm/min<br>(150 in./min)   | 2.7 kg/h<br>(6.1 lb/h)  | 87 %                    |
| 1.6 mm<br>(1/16 in.)       | 300 A   | 30 V    | 35 cm/min<br>(250 in./min)   | 4.6 kg/h<br>(10.2 lb/h) | 87 %                    |
| 1.6 mm<br>(1/16 in.)       | 365 A   | 33 V    | 762 cm/min<br>(300 in./min)  | 5.5 kg/h<br>(12.3 lb/h) | 86 %                    |
| 1.6 mm<br>(1/16 in.)       | 410 A   | 33 V    | 889 cm/min<br>(350 in./min)  | 6.3 kg/h<br>(14.0 lb/h) | 88 %                    |



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| Recommended Welding Parameters |           |         |                               |                                      |
|--------------------------------|-----------|---------|-------------------------------|--------------------------------------|
| Wire Diameter                  | Current   | Voltage | TTW Dist.                     | Wire Feed Speed                      |
| <b>100% CO<sub>2</sub></b>     |           |         |                               |                                      |
| 1.2 mm<br>(.045 in.)           | 130-200 A | 23-26 V | 9.5-12.7 mm<br>(3/8-1/2 in.)  | 381-660 cm/min<br>(150-260 in./min)  |
| 1.2 mm<br>(.045 in.)           | 200-225 A | 25-27 V | 12.7-19 mm<br>(1/2-3/4 in.)   | 660-965 cm/min<br>(260-380 in./min)  |
| 1.2 mm<br>(.045 in.)           | 225-265 A | 26-30 V | 19-25.4 mm<br>(3/4-1 in.)     | 965-1321 cm/min<br>(380-520 in./min) |
| 1.4 mm<br>(.052 in.)           | 125-235 A | 23-26 V | 12.7-16 mm<br>(1/2-5/8 in.)   | 279-584 cm/min<br>(110-230 in./min)  |
| 1.4 mm<br>(.052 in.)           | 235-290 A | 25-29 V | 16-19 mm<br>(5/8-3/4 in.)     | 584-864 cm/min<br>(230-340 in./min)  |
| 1.4 mm<br>(.052 in.)           | 290-350 A | 29-31 V | 19-25.4 mm<br>(3/4-1 in.)     | 864-1194 cm/min<br>(340-470 in./min) |
| 1.6 mm<br>(1/16 in.)           | 165-270 A | 25-28 V | 16-19 mm<br>(5/8-3/4 in.)     | 279-508 cm/min<br>(110-200 in./min)  |
| 1.6 mm<br>(1/16 in.)           | 270-345 A | 27-30 V | 19-25.4 mm<br>(3/4-1 in.)     | 508-762 cm/min<br>(200-300 in./min)  |
| 1.6 mm<br>(1/16 in.)           | 345-415 A | 28-32 V | 25.4-31.75 mm<br>(1-1.25 in.) | 762-1067 cm/min<br>(300-420 in./min) |