

## OK Autrod 12.64

A copper coated, G4Si1/ER70S-6 solid wire for GMAW of general structural and engineering unalloyed and low-alloyed carbon-manganese steels. Compared with OK Autrod 12.51, OK Autrod 12.64 has a slightly higher silicon and manganese content, which increases the weld metal strength. The high silicon content promotes low sensitivity to surface impurities and contributes to smooth, sound welds. The electrode may be welded with either a gas mixture or with pure CO<sub>2</sub> as the shielding gas. OK Autrod 12.64 can even be delivered in the unique Esab Octagonal Marathon Pac, which is an excellent choice in mechanised welding applications.

| Specifications         |                                                                                                                                                                                                                     |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Classifications</b> | EN ISO 636-A : W 46 3 4Si1<br>EN ISO 14341-A : G 42 3 C1 4Si1<br>EN ISO 14341-A : G 46 5 M20 4Si1<br>EN ISO 14341-A : G 46 5 M21 4Si1<br>EN ISO 636-A : W4Si1<br>EN ISO 14341-A : G 4Si1<br>SFA/AWS A5.18 : ER70S-6 |
| <b>Approvals</b>       | ABS : 3Y SA<br>BV : SA3YM (C1,M21)<br>CE : EN 13479<br>CWB : B-G 49A 3 C1 S6<br>DB : 42.039.11<br>DNV-GL : III YMS (C1, M21)<br>LR : 3YS H15 (C1, M21)<br>UKCA : EN 13479<br>VdTÜV : 04294                          |

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

|                      |                                        |
|----------------------|----------------------------------------|
| <b>Alloy Type</b>    | Carbon-manganese steel (Mn/Si-alloyed) |
| <b>Shielding Gas</b> | M20, M21, C1 (EN ISO 14175)            |

| Tensile Properties                   |                |                  |            |
|--------------------------------------|----------------|------------------|------------|
| Testing Condition                    | Yield Strength | Tensile Strength | Elongation |
| <b>AWS C1</b>                        |                |                  |            |
| As Welded                            | 450 MPa        | 550 MPa          | 30 %       |
| <b>EN M21</b>                        |                |                  |            |
| Stress Relieved<br>15 hour(s) 620 °C | 385 MPa        | 520 MPa          | -          |
| <b>EN C1</b>                         |                |                  |            |
| As Welded                            | 460 MPa        | 570 MPa          | 28 %       |
| <b>EN M20</b>                        |                |                  |            |
| As Welded                            | 528 MPa        | 617 MPa          | 22 %       |
| <b>EN M21</b>                        |                |                  |            |
| As Welded                            | 490 MPa        | 590 MPa          | 29 %       |

| Charpy Testing                       |              |              |
|--------------------------------------|--------------|--------------|
| Testing Condition                    | Testing Temp | Impact Value |
| <b>AWS C1</b>                        |              |              |
| As Welded                            | -30 °C       | 100 J        |
| <b>EN M21</b>                        |              |              |
| Stress Relieved<br>15 hour(s) 620 °C | 20 °C        | 120 J        |
| Stress Relieved<br>15 hour(s) 620 °C | -20 °C       | 90 J         |
| <b>EN C1</b>                         |              |              |
| As Welded                            | 20 °C        | 110 J        |

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### Charpy Testing

| Testing Condition | Testing Temp | Impact Value |
|-------------------|--------------|--------------|
| As Welded         | -30 °C       | 75 J         |
| <b>EN M20</b>     |              |              |
| As Welded         | -50 °C       | 105 J        |
| <b>EN M21</b>     |              |              |
| As Welded         | 20 °C        | 130 J        |
| As Welded         | -20 °C       | 120 J        |
| As Welded         | -30 °C       | 100 J        |
| As Welded         | -40 °C       | 90 J         |
| As Welded         | -50 °C       | 80 J         |

### Typical Weld Metal Analysis %

| C          | Mn   | Si   | S     | P     |
|------------|------|------|-------|-------|
| <b>C1</b>  |      |      |       |       |
| 0.09       | 1.08 | 0.70 | 0.013 | 0.013 |
| <b>M20</b> |      |      |       |       |
| 0.07       | 1.39 | 0.67 | 0.009 | 0.01  |
| <b>M21</b> |      |      |       |       |
| 0.10       | 1.28 | 0.80 | 0.013 | 0.013 |

### Typical Wire Composition %

| C     | Mn   | Si   |
|-------|------|------|
| 0.074 | 1.68 | 0.95 |

### Deposition Data

| Diameter | Amps      | Volts   | Wire Feed Speed | Deposition Rate |
|----------|-----------|---------|-----------------|-----------------|
| 0.8 mm   | 60-185 A  | 18-24 V | 3.2-10.0 m/min  | 0.8-2.5 kg/h    |
| 0.9 mm   | 70-250 A  | 18-26 V | 3.0-12.0 m/min  | 0.8-3.3 kg/h    |
| 1.0 mm   | 80-300 A  | 18-32 V | 2.7-15.0 m/min  | 1.0-5.5 kg/h    |
| 1.2 mm   | 120-380 A | 18-35 V | 2.3-15.0 m/min  | 1.2-8.0 kg/h    |
| 1.4 mm   | 150-420 A | 22-36 V | 2.5-12.0 m/min  | 1.7-8.5 kg/h    |
| 1.6 mm   | 225-550 A | 28-38 V | 2.3-12.0 m/min  | 2.1-11.4 kg/h   |
| 2.0 mm   | 300-650 A | 32-44 V | 4.0-15.0 m/min  | 3.2-12.5 kg/h   |