

## OK Flux 10.72

Agglomerated aluminate-basic flux for Submerged Arc Welding especially for applications with toughness requirements at low temperature. Excellent slag removal also in narrow V-joints. For wind tower productions, pressure vessels, general constructions etc. Extremely high current carrying capacity. For single or multi wire procedures. Suitable for DC and AC welding. Single layer and multi layer welding of unlimited plate thickness.

| Especificaciones |                                                    |
|------------------|----------------------------------------------------|
| Clasificaciones  | EN ISO 14174 : S A AB 1 57 AC H5                   |
| Aprobaciones     | CE : EN 13479<br>DB : 51.039.12<br>UKCA : EN 13479 |

Las aprobaciones se basan en la ubicación de la fábrica. Póngase en contacto con ESAB para obtener más información.

|                           |                                              |
|---------------------------|----------------------------------------------|
| Hidrógeno Difusible       | max 5 ml/100g weld metal (Redried flux)      |
| Tamaño de escoria         | Aluminate-basic                              |
| Transferencia de aleación | No Silicon and moderately Manganese alloying |
| Densidad                  | nom: 1.2 kg/dm <sup>3</sup>                  |
| Índice de Basicidad       | nom: 1.9                                     |

| Consumo de flux |                         |                         |
|-----------------|-------------------------|-------------------------|
| Tensión         | Kg Flux / Kg Alambre dc | Kg Flux / Kg Alambre AC |
| 34 V            | 1.3 kg                  | 1.2 kg                  |
| 30 V            | 1.0 kg                  | 0.9 kg                  |
| 26 V            | 0.7 kg                  | 0.6 kg                  |
| 38 V            | 1.6 kg                  | 1.4 kg                  |

Condición : Dimension Ø 4.0 mm , Corriente 580 A , Velocidad de desplazamiento 55 cm/min

| Clasificaciones |                                         |                          |                      |                                         |
|-----------------|-----------------------------------------|--------------------------|----------------------|-----------------------------------------|
| Alambre         | AWS/EN                                  | EN - Soldadura           | AWS - Soldadura      | AWS - Tratamiento térmico pos soldadura |
| Spoolarc 29S    | A5.17:EM13K                             | -                        | -                    | -                                       |
| OK Autrod 12.20 | A5.17:EM12/ 14171-A:S2                  | 14171-A: S 38 5 AB S2    | A5.17: F7A8-EM12     | A5.17: F6P8-EM12                        |
| OK Autrod 12.22 | A5.17:EM12K/ 14171-A:S2Si               | 14171-A: S 42 5 AB S2Si  | A5.17: F7A8-EM12K    | A5.17: F6P8-EM12K                       |
| OK Autrod 12.24 | A5.23:EA2/ 14171-A:S2Mo; 24598-A:S S Mo | 14171-A: S 46 3 AB S2Mo  | A5.23: F8A5-EA2-A3   | A5.23: F8P5-EA2-A3                      |
| OK Autrod 13.24 | A5.23:ENi6/ 14171-A:S3Ni1Mo0,2          | -                        | -                    | -                                       |
| OK Autrod 13.27 | A5.23:ENi2/ 14171-A:S2Ni2               | 14171-A: S 46 6 AB S2Ni2 | A5.23: F8A8-ENi2-Ni2 | A5.23: F7P8-ENi2-Ni2                    |
| OK Autrod 13.62 | A5.23:EG/ 14171-A:SZ3TiB                | -                        | -                    | -                                       |
| OK Autrod 13.64 | A5.23:EA2TiB/ 14171-A:S2MoTiB           | -                        | A5.23: F8TA8-EA2TiB  | -                                       |

| Aprobaciones    |     |    |    |       |     |     |
|-----------------|-----|----|----|-------|-----|-----|
| Alambre         | CWB | CE | DB | VdTÜV | ABS | DNV |
| Spoolarc 81     | •   | -  | -  | -     | -   | -   |
| OK Autrod 12.20 | -   | •  | •  | •     | -   | -   |
| OK Autrod 12.22 | -   | •  | •  | •     | •   | •   |
| OK Autrod 12.24 | -   | •  | •  | •     | -   | -   |
| OK Autrod 13.27 | -   | •  | -  | -     | -   | -   |

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| % típico de composición de alambre |      |      |       |       |      |      |      |      |      |
|------------------------------------|------|------|-------|-------|------|------|------|------|------|
| C                                  | Mn   | Si   | S     | P     | Ni   | Cr   | Mo   | Cu   | Ti   |
| <b>Spoolarc 29S</b>                |      |      |       |       |      |      |      |      |      |
| 0.08                               | 1.15 | 0.5  | 0.006 | 0.013 | -    | -    | -    | 0.06 | -    |
| <b>Spoolarc 71</b>                 |      |      |       |       |      |      |      |      |      |
| 0.10                               | 1.22 | 0.55 | 0.01  | 0.01  | -    | -    | -    | -    | 0.07 |
| <b>Spoolarc 75</b>                 |      |      |       |       |      |      |      |      |      |
| 0.08                               | 0.89 | 0.46 | 0.01  | 0.00  | 0.98 | 0.04 | 0.01 | 0.07 | -    |
| <b>Spoolarc 81</b>                 |      |      |       |       |      |      |      |      |      |
| 0.09                               | 0.95 | 0.26 | 0.01  | 0.01  | -    | -    | -    | -    | -    |
| <b>Spoolarc ENi4</b>               |      |      |       |       |      |      |      |      |      |
| 0.17                               | 0.73 | 0.19 | 0.00  | 0.00  | 1.74 | -    | 0.17 | 0.06 | -    |
| <b>OK Autrod 12.20</b>             |      |      |       |       |      |      |      |      |      |
| 0.10                               | 1.06 | 0.07 | -     | -     | -    | -    | -    | -    | -    |
| <b>OK Autrod 12.22</b>             |      |      |       |       |      |      |      |      |      |
| 0.09                               | 1.01 | 0.19 | -     | -     | -    | -    | -    | -    | -    |
| <b>OK Autrod 12.24</b>             |      |      |       |       |      |      |      |      |      |
| 0.09                               | 1.08 | 0.14 | -     | -     | -    | -    | 0.48 | -    | -    |
| <b>OK Autrod 13.24</b>             |      |      |       |       |      |      |      |      |      |
| 0.12                               | 1.52 | 0.23 | -     | -     | 0.88 | -    | 0.19 | -    | -    |
| <b>OK Autrod 13.27</b>             |      |      |       |       |      |      |      |      |      |
| 0.10                               | 1.02 | 0.14 | -     | -     | 2.19 | -    | -    | -    | -    |
| <b>OK Autrod 13.62</b>             |      |      |       |       |      |      |      |      |      |
| 0.07                               | 1.55 | 0.28 | -     | -     | -    | -    | 0.01 | -    | 0.14 |
| <b>OK Autrod 13.64</b>             |      |      |       |       |      |      |      |      |      |
| 0.07                               | 1.22 | 0.28 | -     | -     | -    | -    | 0.49 | -    | 0.14 |

| % típico de composición de alambre |  |  |  |  |  |  |  |  |  |
|------------------------------------|--|--|--|--|--|--|--|--|--|
| <b>B</b>                           |  |  |  |  |  |  |  |  |  |
| <b>OK Autrod 13.62</b>             |  |  |  |  |  |  |  |  |  |
| 0.013                              |  |  |  |  |  |  |  |  |  |
| <b>OK Autrod 13.64</b>             |  |  |  |  |  |  |  |  |  |
| 0.013                              |  |  |  |  |  |  |  |  |  |

| % típico de análisis de metal de soldadura         |      |      |       |       |      |      |      |       |       |
|----------------------------------------------------|------|------|-------|-------|------|------|------|-------|-------|
| C                                                  | Mn   | Si   | S     | P     | Ni   | Cr   | Mo   | V     | Al    |
| <b>Spoolarc 29S As Welded</b>                      |      |      |       |       |      |      |      |       |       |
| 0.06                                               | 1.96 | 0.56 | 0.012 | 0.017 | 0.05 | 0.08 | 0.03 | 0.005 | 0.016 |
| <b>Spoolarc 29S Stress Relieved 1 hr. @ 1150°F</b> |      |      |       |       |      |      |      |       |       |
| 0.06                                               | 1.96 | 0.56 | 0.012 | 0.017 | 0.05 | 0.08 | 0.03 | 0.005 | 0.016 |
| <b>Spoolarc 75 As Welded</b>                       |      |      |       |       |      |      |      |       |       |
| 0.07                                               | 1.84 | 0.55 | 0.005 | 0.016 | 0.84 | 0.04 | 0.01 | 0.008 | -     |
| <b>Spoolarc ENi4 As Welded</b>                     |      |      |       |       |      |      |      |       |       |
| 0.08                                               | 1.47 | 0.34 | 0.006 | 0.013 | 1.62 | 0.05 | 0.15 | -     | -     |
| <b>OK Autrod 12.20 AC, 580A, 29V</b>               |      |      |       |       |      |      |      |       |       |
| 0.06                                               | 1.4  | 0.2  | -     | -     | -    | -    | -    | -     | -     |
| <b>OK Autrod 12.20 DC+, 580A, 29V</b>              |      |      |       |       |      |      |      |       |       |
| 0.05                                               | 1.5  | 0.2  | -     | -     | -    | -    | -    | -     | -     |

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### % típico de análisis de metal de soldadura

| C                                     | Mn  | Si   | S | P | Ni  | Cr | Mo  | V | Al |
|---------------------------------------|-----|------|---|---|-----|----|-----|---|----|
| <b>OK Autrod 12.22 AC, 580A, 29V</b>  |     |      |   |   |     |    |     |   |    |
| 0.08                                  | 1.4 | 0.3  | - | - | -   | -  | -   | - | -  |
| <b>OK Autrod 12.22 DC+, 580A, 29V</b> |     |      |   |   |     |    |     |   |    |
| 0.05                                  | 1.5 | 0.3  | - | - | -   | -  | -   | - | -  |
| <b>OK Autrod 12.24 AC, 580A, 29V</b>  |     |      |   |   |     |    |     |   |    |
| 0.06                                  | 1.5 | 0.2  | - | - | -   | -  | 0.5 | - | -  |
| <b>OK Autrod 12.24 DC+, 580A, 29V</b> |     |      |   |   |     |    |     |   |    |
| 0.05                                  | 1.6 | 0.2  | - | - | -   | -  | 0.5 | - | -  |
| <b>OK Autrod 13.27 AC, 580A, 29V</b>  |     |      |   |   |     |    |     |   |    |
| 0.07                                  | 1.4 | 0.30 | - | - | 2.2 | -  | -   | - | -  |
| <b>OK Autrod 13.27 DC+, 520A, 29V</b> |     |      |   |   |     |    |     |   |    |
| 0.05                                  | 1.4 | 0.30 | - | - | 2.2 | -  | -   | - | -  |

### % típico de análisis de metal de soldadura

| Cu                                                 | Nb    | Ti    | Co    |
|----------------------------------------------------|-------|-------|-------|
| <b>Spoolarc 29S As Welded</b>                      |       |       |       |
| 0.122                                              | 0.002 | 0.004 | 0.009 |
| <b>Spoolarc 29S Stress Relieved 1 hr. @ 1150°F</b> |       |       |       |
| 0.122                                              | 0.002 | 0.004 | 0.009 |
| <b>Spoolarc 75 As Welded</b>                       |       |       |       |
| 0.080                                              | -     | 0.002 | -     |
| <b>Spoolarc ENi4 As Welded</b>                     |       |       |       |
| 0.060                                              | -     | -     | -     |

### Propiedades mecánicas típicas

| Alambre       | Condición          | Límite de flujo    | Resistencia a la tracción | Alargamiento | Prueba Charpy                                                                                                                                                                |
|---------------|--------------------|--------------------|---------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spoolarc 29S  | Como queda soldado | 532 MPa ( 77 ksi ) | 622 MPa ( 90 ksi )        | 25 %         | 57 J @ -40 °C<br>( 42 ft-lb @ -40 °F )<br>43 J @ -46 °C<br>( 32 ft-lb @ -50.8 °F )<br>41 J @ -51 °C<br>( 30 ft-lb @ -59.8 °F )                                               |
| Spoolarc 75   | Como queda soldado | 556 MPa ( 81 ksi ) | 646 MPa ( 94 ksi )        | 28 %         | 91 J @ -40 °C<br>( 67 ft-lb @ -40 °F )<br>83 J @ -51 °C<br>( 61 ft-lb @ -59.8 °F )                                                                                           |
| Spoolarc 81   | Como queda soldado | 415 MPa ( 60 ksi ) | 500 MPa ( 73 ksi )        | 30 %         | 119 J @ -29 °C<br>( 88 ft-lb @ -20.2 °F )<br>100 J @ -40 °C<br>( 74 ft-lb @ -40 °F )<br>71 J @ -51 °C<br>( 53 ft-lb @ -59.8 °F )<br>50 J @ -62 °C<br>( 37 ft-lb @ -79.6 °F ) |
| Spoolarc ENi4 | Como queda soldado | 607 MPa ( 88 ksi ) | 677 MPa ( 98 ksi )        | 27 %         | 141 J @ -40 °C<br>( 104 ft-lb @ -40 °F )<br>107 J @ -51 °C<br>( 79 ft-lb @ -59.8 °F )<br>88 J @ -62 °C<br>( 65 ft-lb @ -79.6 °F )                                            |

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| Propiedades mecánicas típicas |                               |                    |                           |              |                                                                                                                                                                          |
|-------------------------------|-------------------------------|--------------------|---------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alambre                       | Condición                     | Límite de flujo    | Resistencia a la tracción | Alargamiento | Prueba Charpy                                                                                                                                                            |
| OK Autrod 12.20               | Como queda soldado<br>AWS DC+ | 415 MPa ( 60 ksi ) | 500 MPa ( 73 ksi )        | 30 %         | 125 J @ -30 °C<br>( 93 ft-lb @ -22 °F )<br>100 J @ -40 °C<br>( 74 ft-lb @ -40 °F )<br>70 J @ -50 °C<br>( 52 ft-lb @ -58 °F )<br>50 J @ -62 °C<br>( 37 ft-lb @ -79.6 °F ) |
| OK Autrod 12.20               | Como queda soldado<br>EN AC   | 420 MPa            | 500 MPa ( 73 ksi )        | 33 %         | 140 J @ -30 °C<br>( 104 ft-lb @ -22 °F )<br>130 J @ -40 °C<br>( 96 ft-lb @ -40 °F )<br>80 J @ -50 °C<br>( 59 ft-lb @ -58 °F )                                            |
| OK Autrod 12.22               | Como queda soldado<br>AWS DC+ | 440 MPa ( 64 ksi ) | 530 MPa ( 77 ksi )        | 31 %         | 120 J @ -30 °C<br>( 89 ft-lb @ -22 °F )<br>100 J @ -40 °C<br>( 74 ft-lb @ -40 °F )<br>70 J @ -50 °C<br>( 52 ft-lb @ -58 °F )<br>50 J @ -62 °C<br>( 37 ft-lb @ -79.6 °F ) |
| OK Autrod 12.22               | Como queda soldado<br>EN AC   | 425 MPa            | 560 MPa ( 81 ksi )        | 27 %         | 140 J @ -30 °C<br>( 104 ft-lb @ -22 °F )<br>130 J @ -40 °C<br>( 96 ft-lb @ -40 °F )<br>80 J @ -50 °C<br>( 59 ft-lb @ -58 °F )                                            |
| OK Autrod 12.24               | Como queda soldado<br>AWS DC+ | 500 MPa ( 73 ksi ) | 590 MPa ( 86 ksi )        | 25 %         | 60 J @ -30 °C<br>( 44 ft-lb @ -22 °F )<br>40 J @ -40 °C<br>( 30 ft-lb @ -40 °F )<br>35 J @ -46 °C<br>( 26 ft-lb @ -50.8 °F )                                             |
| OK Autrod 12.24               | Como queda soldado<br>EN AC   | 535 MPa            | 600 MPa ( 87 ksi )        | 24 %         | 70 J @ -30 °C<br>( 52 ft-lb @ -22 °F )<br>50 J @ -40 °C<br>( 37 ft-lb @ -40 °F )<br>40 J @ -50 °C<br>( 30 ft-lb @ -58 °F )                                               |
| OK Autrod 13.24               | Como queda soldado<br>AWS DC+ | 530 MPa ( 77 ksi ) | 660 MPa ( 96 ksi )        | 28 %         | 90 J @ 0 °C<br>( 67 ft-lb @ 32 °F )<br>35 J @ -40 °C<br>( 26 ft-lb @ -40 °F )                                                                                            |
| OK Autrod 13.27               | Como queda soldado<br>EN AC   | 520 MPa ( 75 ksi ) | 610 MPa ( 88 ksi )        | 27 %         | 120 J @ -30 °C<br>( 89 ft-lb @ -22 °F )<br>100 J @ -40 °C<br>( 74 ft-lb @ -40 °F )<br>80 J @ -50 °C<br>( 59 ft-lb @ -58 °F )<br>60 J @ -60 °C<br>( 44 ft-lb @ -76 °F )   |
| OK Autrod 13.27               | Como queda soldado<br>AWS DC+ | 490 MPa ( 71 ksi ) | 610 MPa ( 88 ksi )        | 30 %         | 100 J @ -40 °C<br>( 74 ft-lb @ -40 °F )                                                                                                                                  |

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| Propiedades mecánicas típicas |                                                                                                                                                             |                    |                           |              |                                                                                      |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------|--------------|--------------------------------------------------------------------------------------|
| Alambre                       | Condición                                                                                                                                                   | Límite de flujo    | Resistencia a la tracción | Alargamiento | Prueba Charpy                                                                        |
|                               |                                                                                                                                                             |                    |                           |              | 80 J @ -51 °C<br>( 59 ft-lb @ -59.8 °F )<br>50 J @ -62 °C<br>( 37 ft-lb @ -79.6 °F ) |
| OK Autrod 13.62               | Como queda soldado<br>(acc. AWS) Plate<br>thickness: 12mm; Heat<br>Input: 2.2kJ/mm; Side<br>1: 600A, 32V, 53cm<br>/min; Side 2: 700A,<br>32V, 60cm/min; DC+ | 500 MPa ( 73 ksi ) | 610 MPa ( 88 ksi )        | 27 %         | 50 J @ -62 °C<br>( 37 ft-lb @ -79.6 °F )                                             |
| OK Autrod 13.64               | Como queda soldado<br>(acc. to AWS) Plate<br>thickness 12mm Heat<br>input 2.2kJ/mm 700A,<br>32V, 60cm/min DC+                                               | 560 MPa ( 81 ksi ) | 660 MPa ( 96 ksi )        | 27 %         | 50 J @ -62 °C<br>( 37 ft-lb @ -79.6 °F )                                             |