

AS 461

SAW Fluxes

SAW Basic and Semi-basic Fluxes

AS 461 is an agglomerated aluminate-basic type flux for the welding of general structural steels, boiler and pipe steels, as well as fine-grain structural steels. The welding flux produces a medium silicon and manganese pick-up and is therefore used in combination with the wire electrodes AS 35 and AS 40A. AS 461 is suitable for twin-wire, tandem and multi-wire welding using the single layer or multi-layer technique. For higher level of toughness, the AS 40A wire electrode is recommended when welding from both sides in one pass or when welding one-sided with the single layer technique. The finely rippled bead surface and the good slag detachability make AS 461 perfectly suited for fillet welds. Welding AS 461 with SUBCORED 31HD should be limited to medium wall thickness and fillet welds. AS 461 can be welded on DC and AC up to 1000 A with the single-wire technique.

Damp flux should be re-dried at 300-350°C.

Grain size according to EN-ISO 14174: 2-16.

Semi-basic agglomerate flux for welding mechanically stressed structures, pressure vessels, pipelines and fine grain steels. Metallurgically neutral. Used with type ETC AS1 ETC AS2 ETC ASH3 wires. 25 kg. plastic bag



| Classification | | |
|----------------|--------|----------------------------|
| | EN ISO | 14174: S A AB 1 67 AC H5 |
| AS 26 | EN ISO | 14171-A- S 35 2 AB S1 |
| AS 35 | EN ISO | 14171-A- S 42 3 AB S2 |
| AS 36 | EN ISO | 14171-A- S 42 4 AB S4 |
| AS 37LN | EN ISO | 14171-A- S 42 4 AB S3Si |
| AS 40 | EN ISO | 14171-A- S 50 3 AB S4Mo |
| AS 40A | EN ISO | 14171-A- S 46 2 AB S2Mo |
| AS 48 | EN ISO | 14171-A- S 42 2 AB S2Ni1Cu |
| AS 67 | EN ISO | 14171-A- S 50 4 AB SZ |
| AS 26 | AWS | A5.17: F6A2-F6P2-EL12 |
| AS 35 | AWS | A5.17: F7A2-F7P4-EM12K |
| AS 36 | AWS | A5.17: F7AP4-EH14 |
| AS 37LN | AWS | A5.17: F7A6-F7P6-EH12K |
| AS 40 | AWS | A5.23: F9A2-EA3-A3 |
| AS 40A | AWS | A5.23: F8A2-F8P2-EA2-A2 |
| AS 48 | AWS | A5.23: F7A2-EG-G |
| AS 67 | AWS | A5.23: F8A4-EG-G |

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| Approvals | | | | | | | | | | |
|-----------|---------------------------|---------------------|---------------------|-------------------|------------------|--------------------|--------------------------|--------------------------|-----------------------|-----|
| | ABS | BV | CRS | DB | DNV | GL | LRS | MMI | RINA | TÜV |
| AS 35 | 3YM-2YT | A3M-3YM-A2 T-2YT | | ● | IIIYM-IIYT | 3YM-2YT | 3YM(F)- 2YAH5(1 side) | | 3YDM- 3DM -2YT -2T | ● |
| AS 36 | | | | ● | IV Y40 Fillet | | | | | ● |
| AS 40A | 3YM-3YT-3YM(F))-3Y(1s | A3TM- A3YTM | 3T- 3YTM - 3Y(F) | IIIYMT | 3YTM | 3T-3YM-3Y T | | 3YDM-3YT-3Y40 T- 3Y40 | | |
| AS 67 | 3Y (1 side) | A3YM (1 side) | 3YM (1 Side) | IIIYM (1 Side) | 3YM (1 Side) | 3YA-H5 (1 Side) | AS-A1 / AS-13 | 3YU (1 Side) | | |

CE

Flux Main Components

| | |
|--|------|
| CaO + CaF ₂ + MgO | 39 % |
| Al ₂ O ₃ + TiO ₂ + ZrO ₂ | 30 % |
| SiO ₂ | 20 % |
| MnO + FeO | 9 % |

Boniszewski Basicity 1.3

Chemical analysis (Typical values in %)

| | | C | Mn | Si | Ni | Mo | Cu |
|----------------|---------------|------|-----|-----|------|-----|-----|
| All weld metal | AS 26 | 0.05 | 1 | 0.4 | - | - | - |
| All weld metal | AS 35 | 0.05 | 1.5 | 0.6 | - | - | - |
| All weld metal | AS 36 | 0.05 | 1.9 | 0.6 | - | - | - |
| All weld metal | AS 37LN | 0.07 | 1.7 | 0.7 | - | - | - |
| All weld metal | AS 40 | 0.06 | 1.9 | 0.6 | - | 0.5 | - |
| All weld metal | AS 40A | 0.07 | 1.5 | 0.6 | - | 0.5 | - |
| All weld metal | AS 48 | 0.07 | 1.5 | 0.6 | 0.7 | - | 0.5 |
| All weld metal | AS 67 | 0.09 | 1.5 | 0.3 | 0.95 | 0.2 | - |
| All weld metal | SUBCORED 31HD | 0.07 | 1.7 | 0.4 | - | - | - |

All-weld metal Mechanical Properties

| | Heat Treatment | Yield Strength (N/mm ²) | Tensile Strength (N/mm ²) | Elongation A5 (%) |
|---------------|----------------|--|--|----------------------|
| AS 26 | As Welded | ≥ 355 | 440-550 | ≥ 24 |
| AS 26 | 620°Cx1h | ≥ 330 | 420-550 | ≥ 22 |
| AS 35 | As Welded | ≥ 420 | 510-620 | ≥ 24 |
| AS 35 | 620°Cx1h | ≥ 400 | 490-650 | ≥ 22 |
| AS 36 | As Welded | ≥ 430 | 510-640 | ≥ 22 |
| AS 36 | 620°Cx1h | ≥ 400 | 490-650 | ≥ 22 |
| AS 37LN | As Welded | ≥ 440 | 530-650 | ≥ 22 |
| AS 37LN | 620°Cx1h | ≥ 420 | 510-650 | ≥ 22 |
| AS 40 | As Welded | ≥ 540 | 630-720 | ≥ 19 |
| AS 40A | As Welded | ≥ 500 | 560-680 | ≥ 22 |
| AS 40A | 620°Cx1h | ≥ 480 | 560-690 | ≥ 20 |
| AS 48 | As Welded | ≥ 450 | 500-600 | ≥ 25 |
| AS 67 | As Welded | ≥ 500 | 590-660 | ≥ 22 |
| SUBCORED 31HD | As Welded | ≥ 420 | 510-640 | ≥ 22 |
| SUBCORED 31HD | 620°Cx1h | ≥ 400 | 480-650 | ≥ 22 |

All-weld metal Mechanical Properties - CV

| | Heat Treatment | Impact Energy (J) | | | |
|---------------|----------------|-------------------|--------|--------|--------|
| | | -20 °C | -30 °C | -40 °C | -50 °C |
| AS 26 | As Welded | ≥ 40 | ≥ 27 | | |
| AS 26 | 620°Cx1h | ≥ 60 | ≥ 27 | | |
| AS 35 | As Welded | ≥ 100 | ≥ 60 | ≥ 27 | |
| AS 35 | 620°Cx1h | ≥ 100 | ≥ 60 | ≥ 47 | |
| AS 36 | As Welded | | ≥ 60 | ≥ 50 | |
| AS 36 | 620°Cx1h | | 60 | ≥ 50 | |
| AS 37LN | As Welded | ≥ 90 | | ≥ 70 | ≥ 27 |
| AS 37LN | 620°Cx1h | ≥ 90 | | ≥ 60 | ≥ 27 |
| AS 40 | As Welded | ≥ 90 | ≥ 50 | | |
| AS 40A | As Welded | ≥ 100 | ≥ 27 | | |
| AS 40A | 620°Cx1h | ≥ 90 | ≥ 27 | | |
| AS 48 | As Welded | ≥ 60 | ≥ 27 | | |
| AS 67 | As Welded | | | ≥ 50 | |
| SUBCORED 31HD | As Welded | ≥ 100 | ≥ 60 | ≥ 40 | |
| SUBCORED 31HD | 620°Cx1h | ≥ 110 | ≥ 70 | ≥ 50 | |

Typical applications

| | Materials |
|---------------|--|
| AS 48 | ASME: EN: S235J0W; S235J2W; S355J0W; S355J2W; S355K2W |
| AS 40A | ASME: ASTM A285 Grades A, B, C; A106 Grades A, B, C; X60, X65 EN: 16Mo3, S(P)355-S(P)460, L245-L450 |
| AS 67 | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)460; L245-L485 |
| AS 35 | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |
| AS 26 | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |
| AS 37LN | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |
| AS 36 | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |
| AS 40 | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |
| SUBCORED 31HD | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |

Redrying

300-350°Cx2-4h

Current Conditions

AC; DC+

AS 461

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Packaging data

| Packaging Type | PE |
|----------------|----|
| Weight (kg) | 25 |
| - | ● |

AS 589

SAW Fluxes

SAW Basic and Semi-basic Fluxes

AS 589 is a fully basic agglomerated submerged-arc welding flux that is widely used for the welding of structural and fine grained low alloy steels requiring high integrity welds with low temperature impact and CTOD fracture toughness properties. AS 589 flux, in combination with a range of Oerlikon submerged-arc wires, in particular with AS 37LN, is established for the welding of offshore structures such as oil platform jackets, piles, decks and modules giving a high level of consistency and mechanical property performance. The flux is widely used for the welding of thick section components in the offshore, nuclear and pressure vessel industries. The flux exhibits a low hydrogen content in the as manufactured condition and gives a high resistance to moisture pick up during exposure under workshop conditions. The flux promotes a very stable arc characteristic during use with excellent slag detachment. The weld is of a uniform even profile with regular fine ripple formation and smooth toe blending. AS 589 flux is suitable for use with DC+ or AC and is ideal for single wire, twin wire, tandem arc [DC+/AC] and other multi-arc systems using up to 1000A with single wire welding. Grain size according to EN-ISO 14174: 2-20.



| Classification | | |
|----------------|--------|-------------------------|
| | EN ISO | 14174: SA FB 1 55 AC H5 |
| AS 35 | AWS | A5.17: F6P8-EM12K |
| AS 35 | AWS | A5.17: F7A6-EM12K |
| AS 35Ni2 | AWS | A5.23: F7A10-ENi2-Ni2 |
| AS 37LN | AWS | A5.17: F7A8-EH12K |
| AS 37LN | AWS | A5.17: F7P8-EH12K |
| AS 40A | AWS | A5.23: F8A4-EA2-A2 |
| AS 40A | AWS | A5.23: F8P4-EA2-A2 |
| AS 66 | AWS | A5.23: F9A8-EF3-F3 |
| AS 66 | AWS | A5.23: F9P8-EF3/EG-F3 |
| AS 67 | AWS | A5.23: F8A10-EG-G |
| AS 67 | AWS | A5.23: F8P10-EG-G |
| AS Cr1Mo | AWS | A5.23: F8P4-EB2R-B2 |
| AS Cr2Mo | AWS | A5.23: F8P2-EB3-B3 |

| Flux Main Components | |
|----------------------|------|
| CaO + MgO | 40 % |
| CaF2 | 25 % |
| Al2O3 + MnO | 20 % |
| SiO2 + TiO2 | 15 % |

| Approvals | | | |
|-----------|-----------|----|-----|
| | ABS | DB | TÜV |
| AS 37LN | 5YQ420 H5 | ● | ● |
| AS 40A | | ● | |

Boniszewski Basicity 3.1

AS 589

SAW Fluxes

SAW Basic and Semi-basic Fluxes

Chemical analysis (Typical values in %)

| | | C | Mn | Si | Cr | Ni | Mo |
|----------------|----------|------|-----|-----|-----|------|-----|
| All weld metal | AS 35 | 0.07 | 0.9 | 0.2 | - | - | - |
| All weld metal | AS 35Ni2 | 0.07 | 0.9 | 0.3 | - | 2.3 | - |
| All weld metal | AS 35Ni3 | 0.06 | 0.9 | 0.2 | - | 3.3 | - |
| All weld metal | AS 37LN | 0.07 | 1.6 | 0.3 | - | - | - |
| All weld metal | AS 40A | 0.07 | 0.9 | 0.2 | - | - | 0.5 |
| All weld metal | AS 66 | 0.07 | 1.5 | 0.3 | - | 0.95 | 0.5 |
| All weld metal | AS 67 | 0.07 | 1.3 | 0.3 | - | 0.9 | 0.2 |
| All weld metal | AS Cr1Mo | 0.07 | 0.9 | 0.3 | 1 | - | 0.5 |
| All weld metal | AS Cr2Mo | 0.08 | 0.6 | 0.3 | 2.2 | - | 1 |

All-weld metal Mechanical Properties

| | Heat Treatment | Yield Strength (N/mm ²) | Tensile Strength (N/mm ²) | Elongation A5 (%) |
|----------|----------------|--|--|----------------------|
| AS 35 | As Welded | ≥ 360 | 450-550 | ≥ 28 |
| AS 35Ni2 | As Welded | ≥ 450 | 550-600 | ≥ 24 |
| AS 37LN | As Welded | ≥ 450 | 530-630 | ≥ 25 |
| AS 40A | As Welded | ≥ 470 | 550-680 | ≥ 24 |
| AS 66 | As Welded | ≥ 550 | 650-750 | ≥ 20 |
| AS 66 | 600°Cx2h | ≥ 540 | 630-730 | ≥ 22 |
| AS 67 | As Welded | ≥ 500 | 560-680 | ≥ 22 |
| AS 67 | 600°Cx2h | ≥ 470 | 540-660 | ≥ 24 |

All-weld metal Mechanical Properties - CV

| | Heat Treatment | Impact Energy (J) | | | | |
|----------|----------------|-------------------|--------|--------|--------|--------|
| | | 0 °C | -20 °C | -40 °C | -60 °C | -80 °C |
| AS 35 | As Welded | ≥ 160 | ≥ 100 | ≥ 50 | | |
| AS 35Ni2 | As Welded | ≥ 140 | ≥ 120 | ≥ 100 | ≥ 70 | ≥ 50 |
| AS 37LN | As Welded | ≥ 180 | | ≥ 100 | ≥ 70 | |
| AS 40A | As Welded | ≥ 120 | ≥ 100 | ≥ 50 | | |
| AS 66 | As Welded | ≥ 120 | ≥ 90 | ≥ 70 | ≥ 47 | |
| AS 66 | 600°Cx2h | ≥ 140 | ≥ 120 | ≥ 90 | ≥ 70 | |
| AS 67 | As Welded | | | ≥ 145 | ≥ 70 | |
| AS 67 | 600°Cx2h | | | ≥ 160 | ≥ 70 | |

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Typical applications

| | Materials |
|----------|--|
| AS 66 | ASME: X70, X80, N-A-XTRA 55, HY80, QIN EN: S(P)420-S(P)500; L245-L485; 20MnMoNi5-5, 15NiCuMoNb5 |
| AS 40A | ASME: X60, X65, ASTM A355 Gr. P1; A182M Gr. F1 EN: 16Mo3, S(P)355-S(P)460, L245-L450 |
| AS 37LN | ASME: A516 all Grades EN: S(P)235-S(P)420 |
| AS 35Ni3 | ASME: ASTM A333 Grade 3, ASTM A334 Grade 3; A352LC3; ASTM A203 D, E EN: 12Ni14, S(P)275-S(P)460 |
| AS Cr1Mo | ASME: A199 and A200 grade T11, A213 Grades T11, T12 EN: 13CrMo4-5, 13CrMoSi5-5 |
| AS 35 | ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360 |
| AS 35Ni2 | EN: 11MnNi5-3, 15NiMn5-3 |
| AS 67 | ASME: ASTM A131 AH40, DH40, EH40, X65, X70 EN: S(P)275-S(P)460 |

Redrying

300-350°Cx2-4h

Current Conditions

AC; DC+

Packaging data

| Packaging Type | PE |
|----------------|----|
| Weight (kg) | 25 |
| - | ● |