

ULTRACORE[®] FC & FCP 309L

FC 309L: E309LT0-1/-4, E309T0-1/-4 & FCP 309L: E309LT1-1/-4, E309T1-1/-4



ULTRACORE[®] FC and FCP 309L are designed for welding dissimilar metals - stainless and mild or low alloy - with unparalleled operator appeal. FC 309L is recommended for high deposition rates in the flat and horizontal welding positions, while FCP 309L has all position welding capability. For stainless flux-cored welding with industry leading arc performance, slag removal and reliability – choose ULTRACORE[®] FC and FCP 309L.

KEY FEATURES

- ▶ **Enhanced Operator Appeal** – Exceptional arc performance, easy slag removal and minimal spatter make achieving high quality welds effortless.
- ▶ **Superior Weld Performance** – Achieve weld deposits with flat to concave bead profiles and resistance to hot-cracking.
- ▶ **Q2 Lot[®] Controlled and Tested** – Certificate showing actual deposit chemistry and calculated ferrite number (FN) available online.
- ▶ **ProTech[®] Foil Bag** – Wire is sealed in a foil bag and cardboard box to prevent exposure to moisture and increase shelf-life.

APPLICATIONS

- ▶ Buffer Layers and Clad Steels – Overlays on CMn, mild steel or low alloy steels.
- ▶ Dissimilar Joints – Stainless types 410, 304L, 321, and 316L to mild and low alloy steels.

WELDING POSITIONS

FC 309L Flat and Horizontal
FCP 309L All Position

CONFORMANCE

AWS A5.22/A5.22M: 1995

FC 309L
 FCP 309L

E309LT0-1/-4, E309T0-1/-4
 E309LT1-1/-4, E309T1-1/-4

ASME SFA-5.22

Same as Above

ABS

CWB

SHIELDING GAS

100% CO₂
 75% Argon / 25% CO₂

DIAMETERS / PACKAGING

| Diameter in. (mm) | 25 lb (11.3 kg) Plastic Spool in Foil Bag | |
|----------------------|--|----------|
| | FC 309L | FCP 309L |
| 0.045 (1.1) | ED033006 | ED033010 |
| 1/16 (1.6) | ED033007 | ED033011 |

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AWS TEST RESULTS⁽¹⁾ - As Required per AWS A5.22/A5.22M:1995

| | Yield Strength ⁽²⁾ MPa (ksi) | Tensile Strength MPa (ksi) | Elongation (%) | Ferrite Number |
|---|--|-------------------------------|-------------------|-------------------|
| AWS Requirements FC 309L E309LT0-1/-4, E309T0-1/-4 FCP 309L E309LT1-1/-4, E309T1-1/-4 | Not Specified | 520 (75) 550 (80) | 35 min. | Not Specified |
| Test Results for FC 309L⁽³⁾ As-Welded with 100% CO ₂ As-Welded with 75% Argon / 25% CO ₂ | 440 (64) 435 (63) | 570 (83) 580 (84) | 36 37 | 16 17 |
| Test Results for FCP 309L⁽³⁾ As-Welded with 100% CO ₂ As-Welded with 75% Argon / 25% CO ₂ | 440 (64) 450 (65) | 570 (83) 580 (84) | 34 35 | 11.0 14.6 |

DEPOSIT COMPOSITION⁽¹⁾ - As Required per AWS A5.22/A5.22M: 1995

| | %C | %Mn | %Si | %S | %P | %Ni | %Cr | %Mo | %Cu |
|---|----------------------------|------------|-------------|--------------|--------------|--------------|--------------|-------------|-------------|
| AWS Requirements FC 309L E309LT0-1/-4, E309T0-1/-4 FCP 309L E309LT1-1/-4, E309T1-1/-4 | 0.4 max. ⁽⁴⁾ | 0.5 - 2.5 | 1.0 max. | 0.03 max. | 0.04 max. | 12.0 - 14.0 | 22.0 - 25.0 | 0.5 max. | 0.5 max. |
| Test Results for FC 309L⁽³⁾ As-Welded with 100% CO ₂ As-Welded with 75% Argon / 25% CO ₂ | 0.02 0.02 | 1.5 1.6 | 0.8 0.9 | 0.01 0.01 | 0.02 0.02 | 12.7 12.7 | 23.1 23.3 | 0.3 0.3 | 0.3 0.3 |
| Test Results for FCP 309L⁽³⁾ As-Welded with 100% CO ₂ As-Welded with 75% Argon / 25% CO ₂ | 0.02 0.02 | 0.9 1.1 | 0.6 0.7 | 0.01 0.01 | 0.02 0.02 | 13.6 13.6 | 23.6 23.6 | 0.2 0.2 | 0.3 0.3 |

⁽¹⁾ Typical all weld metal, DC+. NOTE: Certificates of actual results available online. ⁽²⁾ Measured with 0.2% offset. ⁽³⁾ See test results disclaimer below. ⁽⁴⁾ Requirement for E309T1-1 and E309T1-4 is 0.10% max. carbon.

TYPICAL OPERATING PROCEDURES

| Diameter, Polarity CTWD ⁽¹⁾ Shielding Gas ⁽²⁾ | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) | Deposition Rate kg/hr (lb/hr) | Efficiency (%) |
|---|--------------------------------------|--------------------|------------------------------|-----------------------------------|-------------------------------------|-------------------|
| FC 309L - Flat and Horizontal | | | | | | |
| 0.045 in. (1.1 mm), DC+ 3/4 in. (19 mm) 75% Argon / 25% CO ₂ | 6.4 (250) | 24 - 27 | 145 | 2.7 (5.9) | 2.4 (5.2) | 88 |
| | 8.9 (350) | 25 - 28 | 180 | 3.8 (8.3) | 3.3 (7.3) | 88 |
| | 11.4 (450) | 26 - 29 | 200 | 4.9 (10.7) | 4.3 (9.4) | 88 |
| 1/16 in. (1.6 mm), DC+ 1 in. (25 mm) 75% Argon / 25% CO ₂ | 3.6 (140) | 22 - 25 | 170 | 2.8 (6.3) | 2.5 (5.5) | 87 |
| | 6.4 (250) | 24 - 27 | 245 | 5.1 (11.2) | 4.4 (9.7) | 87 |
| | 7.6 (300) | 26 - 29 | 270 | 6.1 (13.4) | 5.3 (11.6) | 87 |
| FCP 309L - All Position | | | | | | |
| 0.045 in. (1.1 mm), DC+ 3/4 in. (19 mm) 75% Argon / 25% CO ₂ | 5.1 (200) | 24 - 27 | 130 | 2.1 (4.6) | 1.8 (3.9) | 85 |
| | 7.6 (300) | 25 - 28 | 155 | 3.2 (7.0) | 2.6 (5.8) | 83 |
| | 10.2 (400) | 26 - 29 | 190 | 4.2 (9.3) | 3.5 (7.8) | 84 |
| 1/16 in. (1.6 mm), DC+ 1 in. (25 mm) 75% Argon / 25% CO ₂ | 3.6 (140) | 23 - 26 | 170 | 2.8 (6.1) | 2.3 (5.0) | 82 |
| | 5.1 (200) | 25 - 28 | 210 | 3.9 (8.7) | 3.2 (7.1) | 82 |
| | 8.9 (350) | 26 - 29 | 290 | 6.9 (15.1) | 5.7 (12.5) | 83 |

⁽¹⁾ To estimate ESO, subtract 1/4 in. (6.0 mm) from CTWD. ⁽²⁾ For 100% CO₂ increase voltage by 2 volts.

TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

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