

SW-309L Cored

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF DISSIMILAR METALS
STAINLESS STEELS AND CARBON STEELS
OR STAINLESS STEELS AND LOW ALLOY METALS



SW-309L Cored

❖ Specification

| | |
|-----------------------|----------------------|
| AWS A5.22 | E309LT1-1/-4 |
| JIS Z3323 | TS309L-FB1 |
| EN ISO 17633-A | T 23 12 L P M21/C1 2 |

❖ Applications

SW-309L Cored is designed for welding of dissimilar metals such as Stainless steels and carbon steels or stainless steels and low alloy steels.

❖ Characteristics on Usage

1. SW-309L Cored is suitable for all position welding makes easier re-arcng ,beautiful bead appearance and better slag removability. This wire contains a high ferrite level in its austenite thus providing better weldability together superior Heat and corrosion resistance.
2. SW-309L Cored is suitable for dissimilar welding such as stainless steel to carbon steel or low-alloy steels, and for under-layer welding on cladded side groove of cladded stainless steel.

❖ Note on Usage

Use 100% CO₂ gas or Ar+20~25% CO₂ gas

❖ Packing

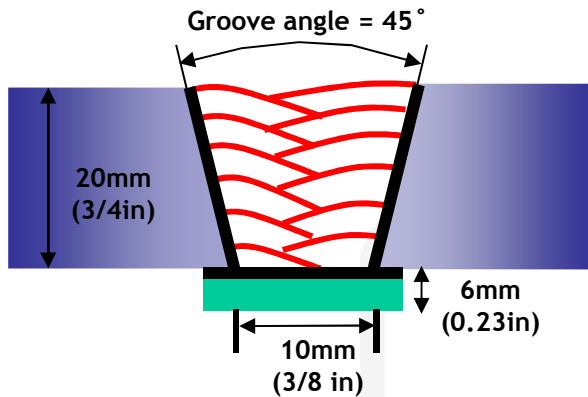
| | | | | |
|------------------------------|--------------------|--------------------|------------------|-----------------|
| Diameter | 0.9mm (0.035in) | 1.2mm (0.045in) | 1.4 (0.052in) | 1.6 (1/16in) |
| Spool *including ball pac | 5kg (11lbs) | 12.5kg (28lbs) | 15kg (33lbs) | 20kg (44lbs) |



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

| | |
|----------------------------|------------------------|
| Diameter(mm) | : 1.2mm(0.045in) |
| Shielding Gas | : 100% CO ₂ |
| Flow Rate(ℓ /min.) | : 20~22 |
| Amp./ Volt. | : 210/30 |
| Stick-Out(mm) | : 20(3/4 in) |
| Pre-Heat(°C) | : R.T . °C(°F) |
| Interpass Temp.(°C) | : ≤150°C(302°F) |
| Polarity | : DC(+) |

❖ Mechanical Properties of All weld metal

| Consumable | Tensile Test | | CVN Impact Test J(ft · lbs) | |
|------------------------|-----------------|-----------|--------------------------------|------------------|
| | TS (Mpa/ksi) | EL (%) | -20°C (-4°F) | -60°C (-76°F) |
| SW-309L Cored | 540(78) | 41.0 | 49(36.1) | 46(33.9) |
| AWS A5.22 E309LTX-X | ≥ 520 | ≥ 30 | Not Specified | |

❖ Chemical Analysis of All weld metal(wt%)

| Consumable | Shielding Gas | Chemical Composition (%) | | | | | | | | |
|------------------------|---------------------|--------------------------|------|-------------|-------|-------|---------------|---------------|-------|-------|
| | | C | Si | Mn | P | S | Ni | Cr | Mo | Cu |
| SW-309L Cored | 100%CO ₂ | 0.027 | 0.74 | 1.27 | 0.021 | 0.006 | 12.99 | 23.36 | 0.130 | 0.125 |
| AWS A5.22 E309LTX-X | | ≤0.04 | ≤1.0 | 0.5 ~2.5 | ≤0.04 | ≤0.03 | 12.0 ~14.0 | 22.0 ~25.0 | ≤ 0.5 | ≤ 0.5 |

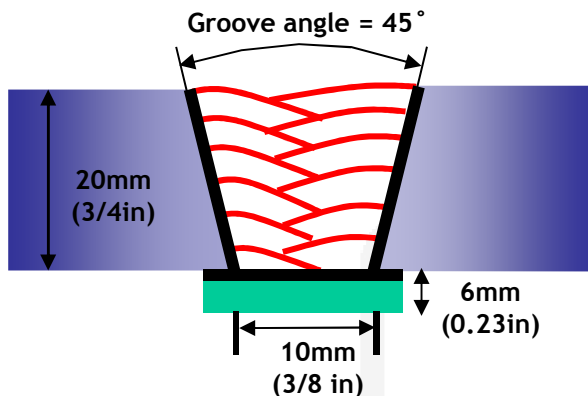
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

| | |
|----------------------------|---------------------------|
| Diameter(mm) | : 1.2mm(0.045in) |
| Shielding Gas | : Ar+200% CO ₂ |
| Flow Rate(ℓ /min.) | : 20~22 |
| Amp./ Volt. | : 210/29 |
| Stick-Out(mm) | : 20(3/4 in) |
| Pre-Heat(°C) | : R.T. . °C(°F) |
| Interpass Temp.(°C) | : ≤150°C(302°F) |
| Polarity | : DC(+) |

❖ Mechanical Properties of All weld metal

| Consumable | Tensile Test | | CVN Impact Test J(ft · lbs) | |
|------------------------|-----------------|-----------|--------------------------------|------------------|
| | TS (Mpa/ksi) | EL (%) | -20°C (-4°F) | -60°C (-76°F) |
| SW-309L Cored | 555(80) | 37 | 46(33.9) | 40(29.5) |
| AWS A5.22 E309LTX-X | ≥ 520 | ≥ 30 | Not Specified | |

❖ Chemical Analysis of the weld metal(wt%)







| Consumable | Shielding Gas | Chemical Composition (%) | | | | | | | | |
|------------------------|----------------------------|--------------------------|------|-------------|-------|-------|---------------|---------------|-------|-------|
| | | C | Si | Mn | P | S | Ni | Cr | Mo | Cu |
| SW-309L Cored | Ar+ 20% CO ₂ | 0.026 | 0.86 | 1.43 | 0.021 | 0.006 | 12.82 | 23.52 | 0.130 | 0.123 |
| AWS A5.22 E309LTX-X | | ≤0.04 | ≤1.0 | 0.5 ~2.5 | ≤0.04 | ≤0.03 | 12.0 ~14.0 | 22.0 ~25.0 | ≤0.5 | ≤0.5 |

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**Mechanical Properties
& Chemical Composition of All Weld Metal**

❖ **Bead Appearance**

| Horizontal Fillet(2F, PB) , Base : STS 304L(6mm,0.23in) | | Fillet Vertical up(3F, PF) , Base : STS 304L(6mm,0.23in) | |
|---|----------------------|--|--|
|  | |  |  |
| | 100% CO2(220A/30V) | | |
|  | | | |
| | Ar+20% CO2(220A/28V) | 100% CO2(160A/25V) | Ar+20% CO2(160A/24V) |
| Dissimilar welding Base : C/S+STS 304L(6T) | | | |
|  | |  | |
| | 100% CO2(220A/30V) | | Ar+20% CO2(220A/28V) |

❖ **δ – Ferrite No.**

| Consumable | Shielding Gas | Diagram | | | FERITSCOPE MP-30 * (FISCHER) |
|------------------|---------------|------------|--------|-----------|---------------------------------|
| | | Schaeffler | Delong | WRC(1992) | |
| SW-309L Cored | 100% CO2 | 11.2 | 20.4 | 14.9 | 18.5~19.5 |
| | Ar+20% CO2 | 12.0 | 21.6 | 16.8 | 18.0~19.0 |

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Welding Efficiency & Proper Welding Condition

❖ Deposition Rate & Efficiency

| Consumable (size) | Shielding Gas | Welding Conditions | | Wire Feed Speed m/min (in/min) | Deposition Efficiency(%) | Deposition Rate kg/hr(lb/hr) |
|----------------------|-----------------------|-----------------------|--------------|---|--|--|
| | | Amp. (A) | Volt. (V) | | | |
| 1.2mm (0.045 in) | 100%CO ₂ | 210 | 30 | 12(472) | 86~88 | 4.6(10.1) |
| | Ar-20%CO ₂ | 210 | 29 | 12(472) | 87~89 | 4.8(10.6) |
| 1.6mm (1/16 in) | 100%CO ₂ | 290 | 33 | 8.9(350) | 86~88 | 5.5(12.1) |
| | Ar-20%CO ₂ | 290 | 32 | 8.9(350) | 87~89 | 5.(12.6) |
| Remark | | | | | Deposition efficiency =(Deposited metal weight/Wire weight used)×100 | Deposition rate =(Deposited metal weight/Welding time,min.)×60 |

❖ Proper Current Range

| Consumable | Shielding Gas | Welding Position | Wire Dia. | |
|------------------|---|------------------|---------------------|--------------------|
| | | | 1.2mm (0.045 in) | 1.6mm (1/16 in) |
| SW-309L Cored | 100%CO ₂ or Ar-20~25%CO ₂ | F | 160~220Amp | 250~290Amp |
| | | HF | 160~220Amp | 250~290Amp |
| | | V-Up & OH | 140~180Amp | - |

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Approvals

| Consumables | Shielding Gas | KR | ABS | LR |
|--|--|---|--|--|
| SW-309L Cored | C1 | RW309LG(C) (-20 °C ≥ 34J) 1.2~1.6 | AWS A5.22 E309LT1-1 1.2~1.6 | SS/CMn 1.2~1.6 |
| | | BV | DNV | GL |
| | | 309L with KV at -20 °C (-20 °C ≥ 34J) 1.2~1.6 | 309L 1.2~1.6 | 4332S 1.2~1.6 |
| | | NK | CWB | TUV |
| | | KW309LG(C) 1.2~1.6 | AWS A5.22-95 E309LT1-1 0.9~1.6 | EN 12073 T 23 12 L P C2 0.9~1.6 |
| | | CE | DB | CCRS |
| EN 12073 T 23 12 L P C2 0.9~1.6 | T 23 12 L P C 2(1.4322) DIN EN ISO 17633-A 0.9~1.6 | AWS A5.22 E309LT1-1 1.2~1.6 | | |
| Consumables | Shielding Gas | CWB | TUV | CE |
| SW-309L Cored | M21 | AWS A5.22-95 E309LT1-4 0.9~1.6 | EN 12073 T 23 12 L P M2 0.9~1.6 | EN 12073 T 23 12 L P M2 0.9~1.6 |
| | | DB | - | - |
| | | T23 12 L P M 2(1.4322) DIN EN ISO 17633-A 0.9~1.6 | - | - |

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