

SF-71LF

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF MILD & 490MPa CLASS
HIGH TENSILE STEEL



❖ Specification

AWS A5.20

E71T-1C

JIS Z3313

T49J 0 T1-1 C A-U

❖ Applications

All position welding of ship buildings, machinery, bridges, building, vehicles using mild and higher strength steels.

❖ Characteristics on Usage

SF-71LF is a titania type flux cored wire for all position welding with CO₂. Compared with solid wire, spatter loss is low, bead appearance is a beautiful and arc is soft with good stability. Slag covering is uniform with good removal. As fume generation is lower than conventional flux cored wire

❖ Note on Usage

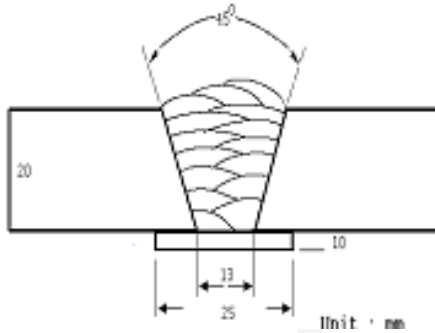
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates.
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.
3. Use 100% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

| | |
|---------------------|------------------------|
| Diameter(mm) | : 1.2mm |
| Shielding Gas | : 100% CO ₂ |
| Flow Rate(l /min.) | : 20~22 |
| Amp./ Volt. | : 280 / 31 |
| Stick-Out(mm) | : 20 |
| Pre-Heat(°C) | : R.T. |
| Interpass Temp.(°C) | : 150±15 |
| Polarity | : DC(+) |

❖ Mechanical Properties of all weld metal

| Consumable | Tensile Test | | | CVN Impact Test (Joule) | |
|----------------------|--------------|---------|-------|-------------------------|-------|
| | YS(MPa) | TS(MPa) | EL(%) | 0°C | -20°C |
| SF-71LF | 550 | 588 | 27 | 95 | 55 |
| AWS A5.20 E71T-1C | ≥ 390 | 490~670 | ≥ 22 | ≥ 27J at -20°C | |

❖ Chemical Analysis of all weld metal(wt%)

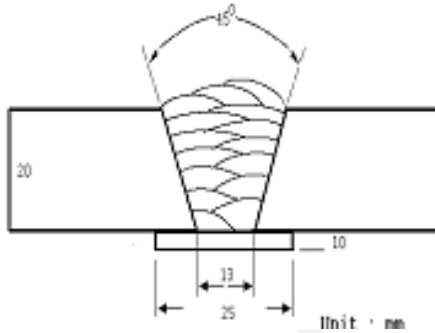
| Consumable | C | Si | Mn | P | S |
|----------------------|--------|-------|--------|--------|--------|
| SF-71LF | 0.04 | 0.50 | 1.45 | 0.010 | 0.008 |
| AWS A5.20 E71T-1C | ≤ 0.12 | ≤ 0.9 | ≤ 1.75 | ≤ 0.03 | ≤ 0.03 |



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

| | |
|----------------------------|------------------------|
| Diameter(mm) | : 1.4mm |
| Shielding Gas | : 100% CO ₂ |
| Flow Rate(ℓ /min.) | : 20~22 |
| Amp./ Volt. | : 300 / 32 |
| Stick-Out(mm) | : 20 |
| Pre-Heat(°C) | : R.T . |
| Interpass Temp.(°C) | : 150±15 |
| Polarity | : DC(+) |

❖ Mechanical Properties of all weld metal

| Consumable | Tensile Test | | | CVN Impact Test (Joule) | |
|----------------------|--------------|---------|-------|-------------------------|-------|
| | YS(MPa) | TS(MPa) | EL(%) | 0°C | -20°C |
| SF-71 | 545 | 585 | 27.5 | 92 | 49 |
| AWS A5.20 E71T-1C | ≥ 390 | 490~670 | ≥ 22 | ≥ 27J at -20°C | |

❖ Chemical Analysis of all weld metal(wt%)

| Consumable | C | Si | Mn | P | S |
|----------------------|--------|-------|--------|--------|--------|
| SF-71 | 0.04 | 0.53 | 1.46 | 0.010 | 0.008 |
| AWS A5.20 E71T-1C | ≤ 0.12 | ≤ 0.9 | ≤ 1.75 | ≤ 0.03 | ≤ 0.03 |

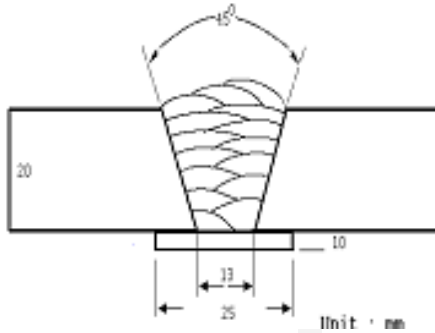
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

- Diameter(mm)** : 1.6mm
- Shielding Gas** : 100% CO₂
- Flow Rate(ℓ /min.)** : 20~22
- Amp./ Volt.** : 330 / 33
- Stick-Out(mm)** : 20
- Pre-Heat(℃)** : R.T .
- Interpass Temp.(℃)** : 150±15
- Polarity** : DC(+)

❖ Mechanical Properties of all weld metal

| Consumable | Tensile Test | | | CVN Impact Test (Joule) | |
|----------------------|--------------|---------|-------|-------------------------|------|
| | YS(MPa) | TS(MPa) | EL(%) | 0℃ | -20℃ |
| SF-71 | 555 | 595 | 27.8 | 95 | 52 |
| AWS A5.20 E71T-1C | ≥ 390 | 490~670 | ≥ 22 | ≥ 27J at -20℃ | |

❖ Chemical Analysis of all weld metal(wt%)

| Consumable | C | Si | Mn | P | S |
|----------------------|--------|-------|--------|--------|--------|
| SF-71 | 0.04 | 0.52 | 1.44 | 0.011 | 0.008 |
| AWS A5.20 E71T-1C | ≤ 0.12 | ≤ 0.9 | ≤ 1.75 | ≤ 0.03 | ≤ 0.03 |

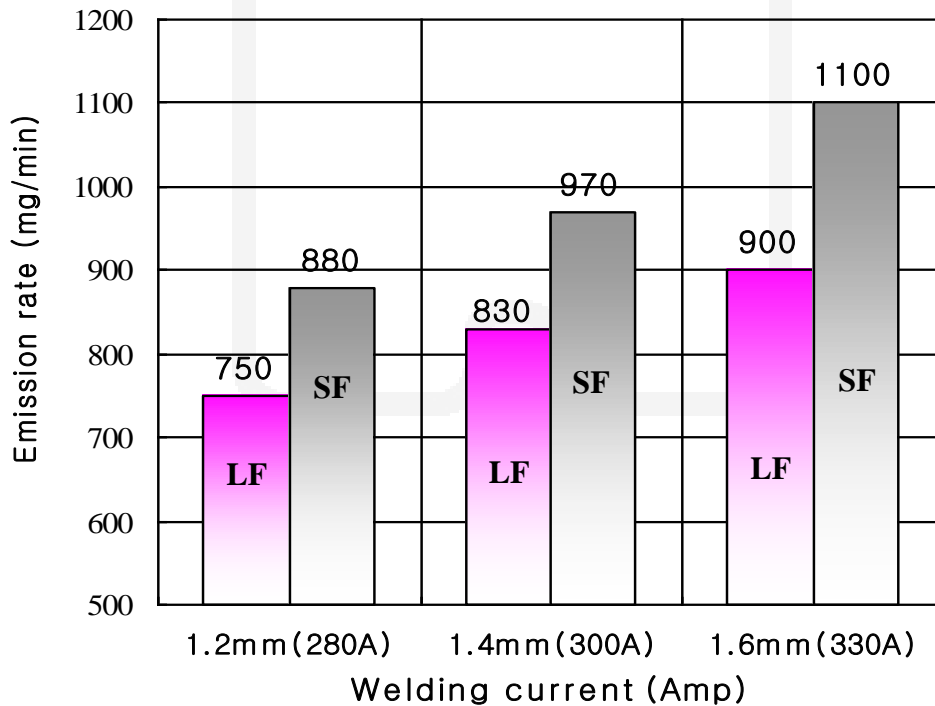
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Fume Generation Rate

❖ Welding Conditions

| | | | |
|---------------------------|------------------------|------------------------------------|-----------------|
| Diameter(mm) | : 1.2, 1.4, 1.6 | Amps(A) | : 280, 300, 330 |
| Shielding Gas | : 100% CO ₂ | Stick-Out(mm) | : 20 |
| Flow Rate(ℓ /min.) | : 20 | Welding Speed | : 30 cpm |
| Welding Position | : 1G | Current Type & Polarity | : DC(+) |
| Fume Suction time | : Total 3min. | Welding Time | : 30sec. |
| Torch Angle | : 90. (deg) | | |



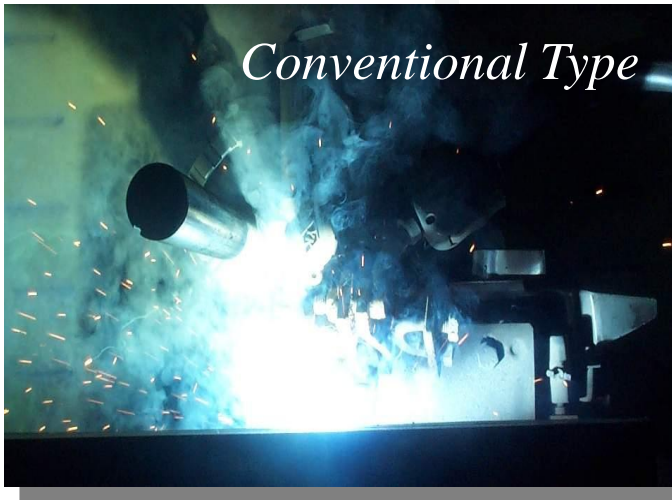


Fume Generation Rate

❖ Welding Conditions

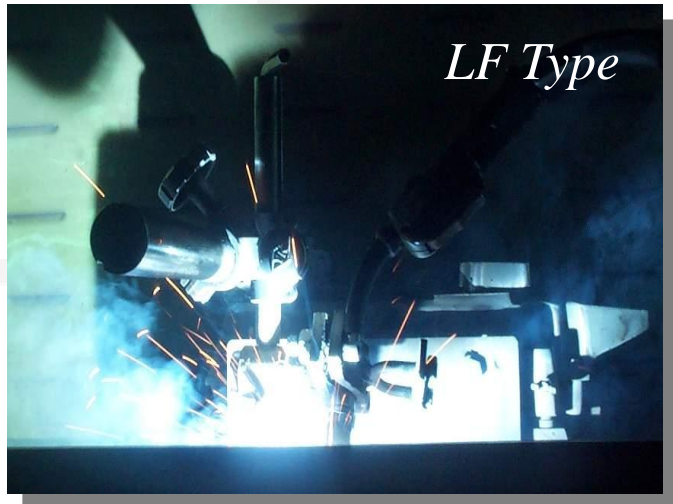
| | | | |
|---------------------------|------------------------|------------------------------------|------------|
| Diameter(mm) | : 1.2 | Amps(A) / Volts(V) | : 280 / 31 |
| Shielding Gas | : 100% CO ₂ | Stick-Out(mm) | : 20 |
| Flow Rate(ℓ /min.) | : 20 | Welding Speed | : 30 cpm |
| Welding Position | : 1G | Current Type & Polarity | : DC(+) |
| Fume Suction time | : Total 3min. | Welding Time | : 30sec. |
| Torch Angle | : 90. (deg) | | |

Conventional Type



SF-71

LF Type



SF-71 LF



Diffusible Hydrogen Content

❖ Welding Conditions

| | | | |
|---------------------------|------------------------|------------------------------------|------------|
| Diameter(mm) | : 1.2 | Amps(A) / Volts(V) | : 280 / 31 |
| Shielding Gas | : 100% CO ₂ | Stick-Out(mm) | : 20 |
| Flow Rate(ℓ /min.) | : 20 | Welding Speed | : 45 cpm |
| Welding Position | : 1G | Current Type & Polarity | : DC(+) |

❖ Hydrogen Analysis Using Gas Chromatography Method

| | | | |
|--------------------------------|-------------|---------------------------|--------------|
| Hydrogen Evolution Time | : 72 hrs | Analysis Temp. | : 25 °C |
| Evolution Temp. | : 25 °C | Exposure Condition | : 80%RH-25°C |
| Barometric Pressure | : 780 mm-Hg | | |

❖ Result(ml/100g Weld Metal)

| X1 | X2 | X3 | X4 |
|-----|-----|-----|-----|
| 5.8 | 5.4 | 5.9 | 5.2 |

Average Hydrogen Content 5.6 ml / 100g Weld Metal



Proper Welding Condition

❖ Proper Current Range

| Consumable | Shielding Gas | Welding Position | Wire Dia. (mm) | | |
|------------|---------------------|------------------|----------------|------------|------------|
| | | | 1.2mm | 1.4mm | 1.6mm |
| SF-71LF | 100%CO ₂ | F & HF | 120~300Amp | 150~350Amp | 200~400Amp |
| | | V-Up & OH | 120~260Amp | 180~280Amp | 180~280mp |
| | | V-Down | 200~300Amp | 220~320Amp | 250~300Amp |



Approvals

❖ AUTHORIZED APPROVAL DETAILS

| Welding Position | Register of shipping & Size(mm) | | | |
|------------------|---------------------------------|-----------------------|------------------------|--|
| | ABS | LR | DNV | NK |
| All V-Down | 2YSAH10, 1.2~1.6 | 2YSH10 1.2~1.6 | IYMSH10 1.2~1.6 | KSW52G(C)H10 KAW52MG(C) 1.2~ 1.6 |