

SC-81BF

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF 550MPa CLASS HIGH TENSILE STEEL

2023.11



❖ Specification

AWS A5.29	E81T1-Ni1C-J, -Ni1M-J H4
(AWS A5.29	E551T1-Ni1C-J, -Ni1M-J H4)
EN ISO 17632-A	T46 4 1Ni P C1/M21 1 H5

❖ Applications

All position welding of ship hulls, vehicles, bridges, chemical plant machinery and other metal fabrication

❖ Characteristics on Usage

SC-81BF is an all position flux cored wire designed for 100% CO₂ shielding gas or Ar-20~25% CO₂ shielding gas. You can get smooth arc, and low spatter, good weldability. The weld metal impact values at -40°C (-40°F) is excellent and has good bead appearance, slag covering is uniform and easy to remove.

❖ Note on Usage

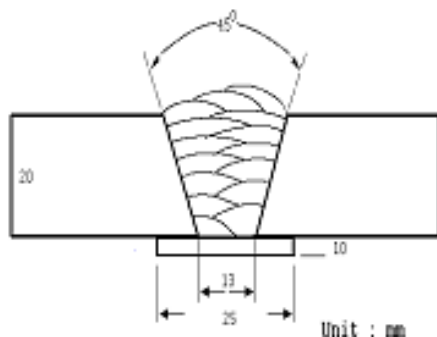
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.
2. Use 100% CO₂ or Ar+20~25% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.2mm(0.045in)
Shielding Gas	: 100%CO ₂ Ar+20%CO ₂
Amp./ Volt.	: 270~280 / 29~31
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Shield gas	Tensile Test			CVN Impact Test J(ft·lbs)
		YS MPa(lbs/in ²)	TS MPa((lbs/in ²)	EL(%)	-40℃ (-40℉)
SC-81BF	100% CO ₂	505 (73,000)	560 (81,000)	31.0	95(70)
	Ar+20%CO ₂	580 (84,000)	640 (93,000)	28.5	105(77)
AWS A5.29 E81T1-Ni1C-J, -Ni1M-J H4		≥ 470 (68,200)	550~690 (79,800~100,000)	≥ 19	≥ 27(20) at -40℃ (-40℉)

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shield gas	C	Si	Mn	P	S	Ni	B
SC-81BF	100% CO ₂	0.040	0.38	0.98	0.007	0.005	0.85	0.004
	Ar+20%CO ₂	0.045	0.50	1.15	0.007	0.005	0.83	0.004
AWS A5.29 E81T1-Ni1C-J, -Ni1M-J H4		≤ 0.12	≤ 0.80	≤ 1.75	≤ 0.03	≤ 0.03	0.8~1.1	-

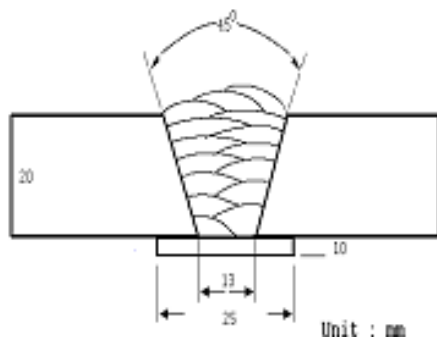
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.6mm(1/16 in)
Shielding Gas	: 100%CO₂ Ar+20%CO₂
Amp./ Volt.	: 320~330 /30~32
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Shield gas	Tensile Test			CVN Impact Test J(ft·lbs)
		YS MPa(lbs/in ²)	TS MPa((lbs/in ²)	EL(%)	-40℃ (-40℉)
SC-81BF	100% CO ₂	510 (74,000)	570 (83,000)	30.0	90(66)
	Ar+20%CO ₂	590 (86,000)	650 (94,000)	27.5	100(74)
AWS A5.29 E81T1-Ni1C-J, -Ni1M-J H4		≥ 470 (68,200)	550~690 (79,800~100,000)	≥ 19	≥ 27(20) at -40℃ (-40℉)

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shield gas	C	Si	Mn	P	S	Ni	B
SC-81BF	100% CO ₂	0.040	0.40	1.00	0.007	0.005	0.86	0.004
	Ar+20%CO ₂	0.045	0.51	1.16	0.007	0.005	0.85	0.004
AWS A5.29 E81T1-Ni1C-J, -Ni1M-J H4		≤ 0.12	≤ 0.80	≤ 1.75	≤ 0.03	≤ 0.03	0.8~1.1	-



Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Shield Gas	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
		Amp. (A)	Volt. (V)			
1.2mm (0.045in)	100%CO ₂	200	25	10.2(400)	86~88	3.0(6.6)
		250	27	13.3(525)	87~88	4.0(8.8)
		300	31	15.3(600)	88~89	5.5(12.1)
	Ar+ 20%CO ₂	200	26	10.2(400)	87~89	3.0(6.6)
		250	28	13.3(525)	88~89	4.1(9.0)
		300	32	15.3(600)	88~90	5.6(12.3)
1.6mm (1/16 in)	100%CO ₂	280	30	6.4 (250)	85~87	3.8(8.4)
		330	32	7.6 (300)	85~88	4.4(9.7)
		350	33	8.1 (320)	86~88	5.3(11.7)
	Ar+ 20%CO ₂	280	31	6.4 (250)	86~88	3.9(8.6)
		330	33	7.6 (300)	86~89	4.5(9.9)
		350	34	8.1 (320)	87~89	5.4(11.9)
Remark				-	Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time, min.)×60



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	: 1.6mm(1/16in)	Amps(A) / Volts(V)	: 250A / 26V
Shielding Gas	: 100%CO ₂ Ar+20%CO ₂	Stick-Out(mm)	: 20mm(0.79in)
Flow Rate(ℓ /min.)	: 20	Welding Speed	: 35 cm/min (13.8 in/min)
Welding Position	: 1G(PA)	Current Polarity	: DC(+)

❖ Diffusible Hydrogen Test Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs
Evolution Temp.	: 45 °C(113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(ml/100g Weld Metal)

Shield gas	X1	X2	X3	X4	Avg.
Ar+20% CO₂	3.6	3.8	3.8	3.9	3.8
100%CO₂	3.1	3.2	3.3	3.3	3.2

Average Diffusible Hydrogen Content 3.8 ml / 100g Weld Metal(Ar+20%CO₂)

Average Diffusible Hydrogen Content 3.2 ml / 100g Weld Metal(100%CO₂)



❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Current
1.2mm (0.045in)	100%CO ₂ Ar+20%CO ₂	Flat	110~280 Amp
		V-up Overhead	110~240 Amp
		V-down	110~280 Amp
1.6mm (1/16 in)	100%CO ₂ Ar+20%CO ₂	Flat	120~300 Amp
		V-up Overhead	120~280 Amp
		V-down	120~300 Amp

❖ F No. & A No.

F-No.	A-No.
6	10

SC-81MC

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF 550MPa CLASS HIGH TENSILE STEEL



❖ Specification

AWS A5.29	E81T1-Ni2C-J/Ni2M -J H4
(AWS A5.29M)	E551T1-Ni2C-J/Ni2M -J H4)
EN ISO 17632-A	T50 5 2Ni P C1/M21 1 H5

❖ Applications

All position welding for mining, construction machinery, bridge structures and storage tanks

❖ Characteristics on Usage

SC-81MC is a titania flux cored wire applicable for all-position welding by 100% CO₂ shielding gas or Ar-20~25% CO₂ shielding gas. You can get smooth arc, and low spatter, good weldability. The weld metal impact values at -51℃(-60°F) is excellent and has good bead appearance, slag covering is uniform and easy to remove.

❖ Note on Usage

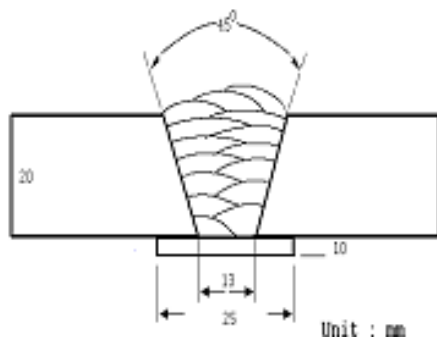
1. Proper preheating(50~150℃(150~302°F)) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates.
2. Use 100%CO₂ or Ar+20~25% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter(mm)	: 1.2mm(0.045 in)
Shielding Gas	: 100%CO ₂ , Ar+20%CO ₂
Amp./ Volt.	: 280~300 /30~31
Stick-Out(mm)	: 20~25 (0.79~0.98in)
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS MPa(lbs/in ²)	TS MPa((lbs/in ²)	EL (%)	-40℃ (-40℉)	-51℃ (-60℉)
SC-81MC	100% CO ₂	545(79,000)	590(86,000)	27.8	125(92)	94(69)
	Ar-20% CO ₂	595(86,000)	655(95,000)	26.4	111(82)	85(63)
AWS A5.29 E81T1-Ni2C/M-J H4		≥ 470(68,000)	550~690 (80,000~100,000)	≥ 19	≥ 27J at -51℃ (≥ 20ft · lbs at 60℉)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S	Ni
SC-81MC	100%CO ₂	0.026	0.22	1.02	0.008	0.004	1.95
	Ar-20%CO ₂	0.036	0.27	1.13	0.007	0.003	1.99
AWS A5.29 E81T1-Ni2C/M-J H4		≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	1.75~ 2.75

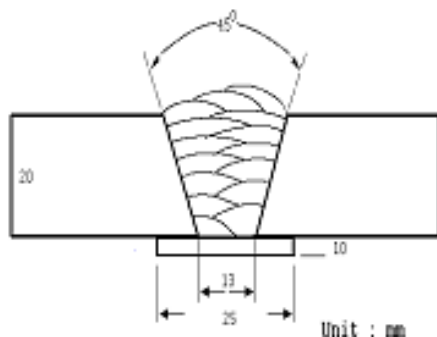
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter(mm)	: 1.6mm(1/16 in)
Shielding Gas	: 100%CO ₂ , Ar+20%CO ₂
Amp./ Volt.	: 320~330 /29~30
Stick-Out(mm)	: 20~25 (0.79~0.98in)
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS MPa(lbs/in ²)	TS MPa((lbs/in ²)	EL (%)	-40℃ (-40℉)	-51℃ (-60℉)
SC-81MC	100% CO ₂	543(79,000)	599(87,000)	28.2	120(89)	90(66)
	Ar-20% CO ₂	597(87,000)	648(94,000)	26.2	110(81)	80(59)
AWS A5.29 E81T1-Ni2C/M-J H4		≥ 470(68,000)	550~690 (80,000~100,000)	≥ 19	≥ 27J at -51℃ (≥ 20ft · lbs at 60℉)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S	Ni
SC-81MC	100%CO ₂	0.024	0.21	1.01	0.007	0.005	1.98
	Ar-20%CO ₂	0.035	0.28	1.12	0.007	0.004	2.02
AWS A5.29 E81T1-Ni2C/M-J H4		≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	1.75~ 2.75

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Welding Efficiency

❖ 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)			
1.6mm (1/16 in)	100%CO ₂	330	32	8.3(325)	86~88	5.3(12)
	Ar-20%CO ₂	330	30	8.3(325)	87~89	5.5(12)
Remark					Deposition efficiency =(Deposited metal weight/Wire weight used)×100	Deposition rate =(Deposited metal weight/Welding time,min.)×60



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	: 1.6mm(1/16in)	Amps(A) / Volts(V)	: 310 / 30
Shielding Gas	: 100%CO ₂ Ar+20%CO ₂	Stick-Out(mm)	: 20mm(0.79in)
Flow Rate(ℓ /min.)	: 20	Welding Speed	: 35 cm/min (13.8 in/min)
Welding Position	: 1G(PA)	Current Polarity	: DC(+)

❖ Diffusible Hydrogen Test Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs
Evolution Temp.	: 45 °C(113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(*ml*/100g Weld Metal)

	X1	X2	X3	X4
100% CO ₂	3.4	3.5	3.5	3.7
Ar-20%CO ₂	3.7	3.8	3.8	3.9

Average Hydrogen Content *3.6 ml / 100g Weld Metal (100% CO₂)*

Average Hydrogen Content *3.8 ml / 100g Weld Metal (Ar-20% CO₂)*



❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Current
1.6mm (1/16 in)	100%CO ₂ or Ar+20%CO ₂	Flat	180~380 Amp
		V-up Overhead	160~320 Amp
		V-down	180~360 Amp

❖ F No. & A No.

F-No.	A-No.
6	10

SC-110M Cored

METAL CORED ARC WELDING CONSUMABLE
FOR 760MPa CLASS HIGH TENSILE STEEL

2018. 02

HYUNDAI WELDING CO., LTD.



SC-110M Cored

❖ Specification

AWS A5.36	E110T15-M21A6-G
(AWS A5.36M)	E760T15-M21A5-G)
(AWS A5.28)	E110C-G)
EN ISO 18276-A	T 69 4 Mn2NiMo M M21 3 H5

❖ Applications

Single and multipass welding of high strength low alloy steel
Such as HY-80, and HY-100

❖ Characteristics on Usage

SC-110M is a metal cored wire which provides an exceptionally
smooth and stable arc, low spatter and minimal slag coverage.

❖ Note on Usage

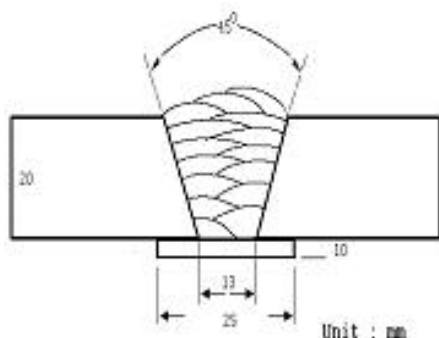
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. One-side welding defects such as hot cracking in may occur with wrong welding parameter such as high welding speed.
3. Use Ar + 20-25% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.2mm (0.045in)
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 280A/ 29V
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T .
Interpass Temp.	: 150±15℃ (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
SC-110M Cored	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)	-50℃ (-58°F)
	730(105)	800(116)	20	40(30)
AWS A5.36 E110T15-M21A6-G	≥ 680 (98)	760~900 (110~130)	≥ 15	≥27J at -50℃ (≥20ft·lbs at -58°F)

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni	Cr	Mo
SC-110M Cored	0.04	0.70	1.80	0.015	0.015	2.0	0.10	0.60
AWS A5.36 E110T15-M21A6-G	N/S (Not Specified) ^h							

* h : The electrode must have a minimum of one or more of the following: ≥0.5%Ni, ≥0.3%Cr, ≥0.2%Mo

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Welding Efficiency

❖ Deposition Rate & Efficiency

Wire Size	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
1.2mm (0.045in)	200	24	7.4(290)	90~92	2.7(5.9)
	250	28	9.8(390)	93~94	4.0(8.8)
	300	30	12.7(500)	94~95	5.7(12.5)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : Ar+20% CO₂



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	: 1.2mm (0.045in)	Amps / Volts	: 270A / 29V
Shielding Gas	: Ar +20% CO ₂	Stick-Out	: 20~25mm (0.79~0.98in)
Flow Rate	: 20 ℓ /min	Welding Speed	: 30 cm/min (12 in/min)
Welding Position	: 1G (PA)	Current Type & Polarity	: DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs
Evolution Temp.	: 45 °C (113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
4.0	3.8	4.1	4.1

Average Hydrogen Content **4.0 ml / 100g Weld Metal**

Recommended Preheating & Inter pass Temp

Thickness of plate mm(in)	Preheating Temp(°C)
< 10 (2/5 in)	> 20°C (68°F)
> 10~20 (2/5~3/4 in)	> 65°C (149°F)
> 20~40 (3/4 ~ 1-1/2)	> 110°C (230°F)
> 40 (1-1/2 in)	> 150°C (302°F)

❖ The purpose of this guide is to avoid cold cracking (by AWS D 1.1/D1.1M:2010, ANNEX I)

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Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.
			1.2mm (0.045in)
SC-110M Cored	Ar+20% CO ₂	F & HF	220~290Amp

❖ F No & A No

F No	A No
6	12

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SF-71

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

2022.02

HYUNDAI WELDING CO., LTD.

**❖ Specification**

<i>AWS A5.20</i>	E71T-1C
<i>(AWS A5.20M)</i>	E491T-1C)
<i>EN ISO 17632-A</i>	T42 0 P C1 1
<i>JIS Z3313</i>	T49J 0 T1-1 C A-U
<i>KS D 7104</i>	YFW-C50DR

❖ Applications

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

**❖ Characteristics
on Usage**

SF-71 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.

❖ Note on Usage

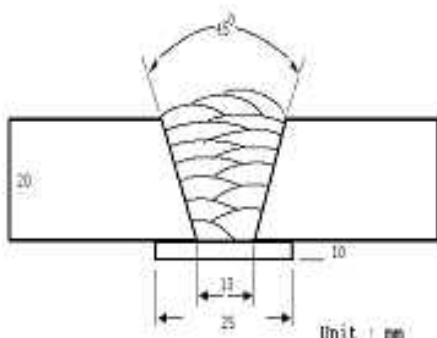
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.
3. Use 100% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.2mm (0.045in)
Shielding Gas	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 280A / 32V
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T .
Interpass Temp.	: 150±15℃ (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-1℃ (30°F)	-18℃ (0°F)
SF-71	548 (79,000)	582 (84,000)	28	86 (63)	50 (37)
AWS A5.20 E71T-1C	≥ 390 (56,000)	490~670 (70,000~ 97,000)	≥ 22	≥ 27J at -18℃ (≥ 20ft · lbs at 0°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71	0.04	0.49	1.29	0.010	0.009
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

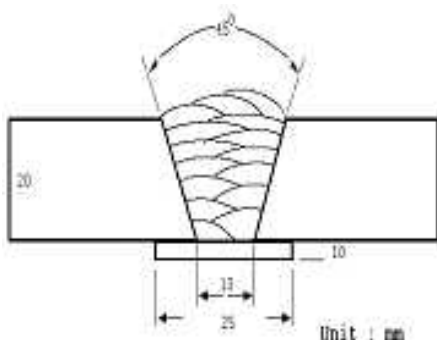
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.4mm (0.052in)
Shielding Gas	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 300A / 32V
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T .
Interpass Temp.	: 150±15℃ (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-1℃ (30°F)	-18℃ (0°F)
SF-71	538 (78,000)	575 (83,000)	27.5	87 (64)	52 (38)
AWS A5.20 E71T-1C	≥ 390 (56,000)	490~670 (70,000~ 97,000)	≥ 22	≥ 27J at -18℃ (≥ 20ft · lbs at 0°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71	0.041	0.52	1.29	0.010	0.008
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

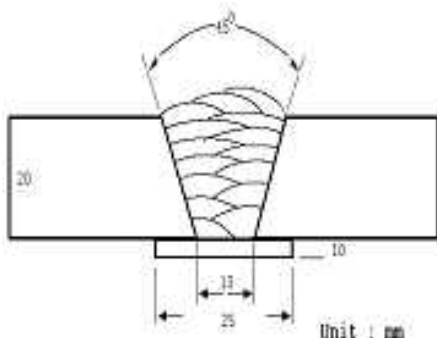
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.6mm (1/16in)
Shielding Gas	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 320~330A / 29~30V
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T .
Interpass Temp.	: 150±15℃ (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-1℃ (30°F)	-18℃ (0°F)
SF-71	540 (78,000)	580 (84,000)	27.5	85 (63)	56 (41)
AWS A5.20 E71T-1C	≥ 390 (56,000)	490~670 (70,000~ 97,000)	≥ 22	≥ 27J at -18℃ (≥ 20ft · lbs at 0°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71	0.04	0.50	1.30	0.011	0.009
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

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Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency %	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
SF- 71 1.2mm (0.045in)	200	26	10.2 (400)	84~87	3.4 (7.5)
	250	28	11.5 (450)	85~88	4.5 (9.9)
	300	33	15.3 (600)	86~88	5.2 (11.4)
SF- 71 1.4mm (0.052in)	250	28	7.6 (300)	85~87	3.9 (8.6)
	300	32	10.2 (400)	85~88	4.8 (10.6)
	330	36	12.8 (500)	86~89	5.8 (12.8)
SF- 71 1.6mm (1/16in)	280	31	6.4 (250)	85~88	4.2 (9.2)
	330	33	7.6 (300)	86~88	4.8 (10.6)
	350	34	8.1 (320)	87~89	5.3 (11.7)
	400	38	9.2 (360)	87~90	5.7 (12.5)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 100%CO₂

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Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.4mm (0.052in)	Amps(A) / Volts(V)	:	240A / 27V
Shielding Gas	:	100%CO ₂	Stick-Out	:	20~25mm (0.79~0.98in)
Flow Rate	:	20 ℓ /min	Welding Speed	:	30 cm/min (12 in/min)
Welding Position	:	1G (PA)	Current Type & Polarity	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	:	72 hrs
Evolution Temp.	:	45 °C (113°F)
Barometric Pressure	:	780 mm-Hg

❖ Result($\text{ml}/100\text{g Weld Metal}$)

X1	X2	X3	X4
6.0	6.4	5.9	6.2

Average Hydrogen Content $6.1 \text{ ml} / 100\text{g Weld Metal}$



Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.		
			1.2mm (0.045in)	1.4mm (0.052in)	1.6mm (1/16in)
SF-71	100%CO ₂	F & HF	120~300Amp	150~350Amp	150~360Amp
		V-Up & OH	120~260Amp	180~280Amp	180~280mp
		V-Down	200~300Amp	220~320Amp	250~320Amp

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Approvals

❖ AUTHORIZED APPROVAL DETAILS

Welding Position	Register of shipping & Size					
	KR	ABS	LR	BV	DNV	NK
All V-Down	2SMG, 2YSMG ©H10 1.2~1.6mm (0.045~1/16in)	2SAH10, 2YSA 1.2~1.6mm (0.045~1/16in)	2S, 2YSH10 1.2~1.6mm (0.045~1/16in)	SA2M,2YMHH A2,2YMHH 1.2~1.6mm (0.045~1/16in)	IYMSH15 1.2~1.6mm (0.045~1/16in)	KSW52Y40G ©H10 1.2~1.6mm (0.045~1/16in)

❖ F No & A No

F No	A No
6	1

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SF-71MC

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

HYUNDAI WELDING CO., LTD.



❖ Specification

AWS A5.36	E71T1-C1A2-CS2 E71T1-M21A2-CS2
AWS A5.36M	E491T1-C1A3-CS2 E491T1-M21A3-CS2
(AWS A5.20)	E71T-1C/-1M/-9C/-9M/-12C/-12M)
EN ISO 17632-A	T 46 2 P C1 1 H10 T 46 3 P M21 1 H10

❖ Applications

All position welding of ship hulls, vehicles, bridges, chemical plant machinery and other metal fabrication

❖ Characteristics on Usage

SF-71MC is a titania flux cored wire applicable for all-position welding by 100% CO₂ shielding gas or Ar – 20~25% CO₂ shielding gas.

Less spattering and good slag detachability shorten the time of bead grinding operation.

❖ Note on Usage

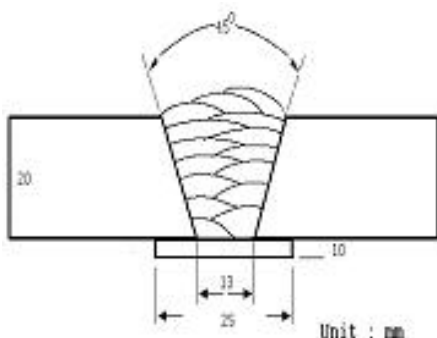
1. Proper preheating(50~150℃, 122~302°F) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use 100% CO₂ or Ar – 20~25% CO₂ shielding gas

**SF-71MC**

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.2mm (0.045in)
Shielding Gas	: 100% CO ₂ Ar-20%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 280A / 32V (100% CO ₂) 280A / 30V (Ar-20%CO ₂)
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T (°C, °F)
Interpass Temp	: 150±15°C (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS Mpa(Ksi)	TS Mpa(Ksi)	EL (%)	-20°C (-4°F)	-30°C (-22°F)
SF-71MC	100% CO ₂	510(74)	550(80)	28.0	95(70)	75(55)
	Ar-20% CO ₂	540(78)	605(88)	28.0	110(81)	90(66)
AWS A5.36 E71T1-C1(M21)A2-CS2		≥ 400 (58)	490~660 (70~95)	≥ 22	≥ 27J at -30°C (≥ 20ft · lbs at -20°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S
SF-71MC	100%CO ₂	0.040	0.40	1.20	0.010	0.012
	Ar-25%CO ₂	0.040	0.50	1.41	0.010	0.014
AWS A5.36 E71T1-C1A2(M21A3)-CS2		≤ 0.12	≤ 0.9	≤ 1.60	≤ 0.03	≤ 0.03

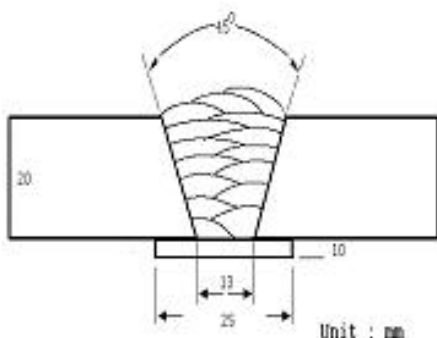
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**SF-71MC**

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.6mm (1/16in)
Shielding Gas	: 100% CO ₂ Ar-20%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 320A / 32V (100% CO ₂) 320A / 30V (Ar-20%CO ₂)
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T (°C, °F)
Interpass Temp	: 150±15°C (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS Mpa(Ksi)	TS Mpa(Ksi)	EL (%)	-20°C (-4°F)	-30°C (-22°F)
SF-71MC	100% CO ₂	500(73)	540(78)	28.5	90(66)	70(52)
	Ar-20% CO ₂	545(79)	600(87)	28.5	100(74)	85(63)
AWS A5.36 E71T1-C1(M21)A2-CS2		≥ 400 (58)	490~660 (70~95)	≥ 22	≥ 27J at -30°C (≥ 20ft · lbs at -20°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S
SF-71MC	100% CO ₂	0.040	0.41	1.23	0.011	0.012
	Ar-25% CO ₂	0.040	0.55	1.42	0.010	0.012
AWS A5.36 E71T1-C1A2(M21A3)-CS2		≤ 0.12	≤ 0.9	≤ 1.60	≤ 0.03	≤ 0.03

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Welding Efficiency

❖ 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	280	32	12.7(500)	86~88	4.8(11)
	Ar-20%CO ₂	280	30	12.7(500)	87~89	5.0(11)
1.6mm (1/16 in)	100%CO ₂	330	32	8.3(325)	86~88	5.3(12)
	Ar-20%CO ₂	330	30	8.3(325)	87~89	5.5(12)
Remark					Deposition efficiency =(Deposited metal weight/Wire weight used)×100	Deposition rate =(Deposited metal weight/Welding time,min.)×60

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**SF-71MC**

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	: 1.6mm (1/16 in)	Amps / Volts	: 260A / 28V
Shielding Gas	: 100%CO ₂ , Ar-20%CO ₂	Stick-Out	: 20~25mm (0.79~0.98in)
Flow Rate	: 20 ℓ/min	Welding Speed	: 30 cm/min (12 in/min)
Welding Position	: 1G (PA)	Current Type & Polarity	: DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs
Evolution Temp.	: 45 °C (113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(*ml*/100g Weld Metal)

X1	X2	X3	X4
6.8	6.9	6.5	6.8

Average Hydrogen Content *6.8 ml / 100g Weld Metal*

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**SF-71MC**

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.	
			1.2mm (0.045 in)	1.6mm (1/16 in)
SF-71MC	100%CO ₂ or Ar-20~25%CO ₂	F	100~280Amp	150~360Amp
		HF	100~280Amp	150~360Amp
		V-Up & OH	140~260Amp	180~300Amp
		V-Down	100~280Amp	150~360Amp

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Approvals

❖ Shipping Approvals

Welding Position	Shielding gas	Register of shipping & Size	
		ABS	LR
All V-Down	100%CO ₂	3YSA H10 1.2~1.6mm (0.045~1/16in)	3YS H10 1.2~1.6mm (0.045~1/16in)
All V-Down	Ar-25%CO ₂	3YSA H10 1.2~1.6mm (0.045~1/16in)	3YS H10 1.2~1.6mm (0.045~1/16in)

❖ F No & A No

F No	A No
6	1

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