HYUNDAI WELDING

Rev. 04

SC-EG3

ELECTRO GAS WELDING CONSUMABLE
FOR LOW TEMPERATURE SERVICE

2018. 02

HYUNDAI WELDING CO., LTD.

SC-EG3

❖ Specification

AWS A5.26 EG82T-NM2

EN ISO 17632-A T46 4 ZMn1.5NiMo M C1 2 H5

❖ Applications

Vertical-up butt welding of side shells and inner structures of bulk carriers in shipbuilding, box girder webs and plate girder in bridge, storage tank and other vertical welding lines

❖ Characteristics on Usage

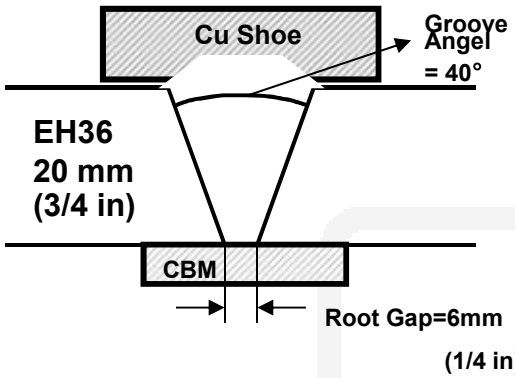
SC-EG3 is metal type flux cored wire to be used with CO2 shielding gas for electro gas arc welding at high speed.
Deposited weld metal toughness is good at low temperature range.
Welding arc is stable and bead appearance is good . It provides highly efficient welding by electro gas process.

❖ Note on Usage

Use 100% CO_2 gas.

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions



[Joint Preparation & Layer Details]

Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2
Flow Rate	:	30~35 ℓ /min
Amp./ Volt.	:	350A / 32V
Heat Input	:	112kJ/cm (284 kJ/in)
Polarity	:	DC(+)
Copper Shoe	:	28 mm(1.1 in)
Baking Material	:	DB-3(Dong-il)

❖ Mechanical Properties of all weld metal

CVN Impact Test			
Temp. (℃)	**CVN Impact Test J(ft · lbs)**		
	F.L – 2mm(5/64 in)	***Center***	***F.L. +2mm(5/64 in)***
-20℃(-4°F)	119(88)	121(89)	98(72)
-40℃(-40°F)	99(73)	86(63)	78(58)
-60℃(-76°F)	76(56)	78(58)	55(41)
AWS A5.26 EG82T-NM2 Spec. : ≥27 (-30℃)			

❖ Chemical Analysis of all weld metal(wt%)

Consumables	Tensile Test			C	Si	Mn	P	S	Mo	Ni
	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)							
SC-EG3	570 (83)	650 (94)	24.0	0.070	0.28	1.73	0.013	0.005	0.16	1.49
AWS A5.26 EG82T-NM2	**≥410 (60)**	**550~700 (80~100)**	**≥20**	**≤0.12**	**0.2~ 0.6**	**1.1~ 2.1**	**≤0.03**	**≤0.03**	**0.10- 0.35**	**1.1~ 2.0**

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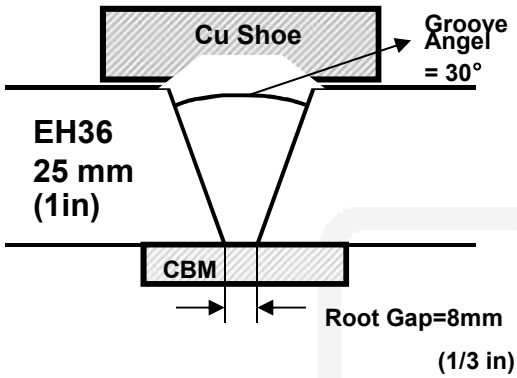
Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions



[Joint Preparation & Layer Details]

Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2
Flow Rate	:	30~35 ℓ /min
Amp./ Volt.	:	380A / 38V
Heat Input	:	170 kJ/cm (432 kJ/in)
Polarity	:	DC(+)
Copper Shoe	:	28 mm(1.1 in)
Baking Material	:	DB-3(Dong-il)

❖ Mechanical Properties of all weld metal

CVN Impact Test			
Temp. (℃)	**CVN Impact Test J(ft · lbs)**		
	F.L – 2mm(5/64 in)	***Center***	***F.L. +2mm(5/64 in)***
-20℃(-4°F)	121(89)	114(84)	101(75)
-40℃(-40°F)	99(73)	98(72)	81(60)
-60℃(-76°F)	68(50)	73(54)	52(38)
AWS A5.26 EG82T-NM2 Spec. : ≥27 (-30℃)			

❖ Chemical Analysis of all weld metal(wt%)

Consumables	Tensile Test			C	Si	Mn	P	S	Mo	Ni
	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)							
SC-EG3	575 (83)	652 (95)	23.8	0.068	0.27	1.72	0.012	0.005	0.15	1.48
AWS A5.26 EG82T-NM2	**≥410 (60)**	**550~700 (80~100)**	**≥20**	**≤0.12**	**0.2~ 0.6**	**1.1~ 2.1**	**≤0.03**	**≤0.03**	**0.10- 0.35**	**1.1~ 2.0**

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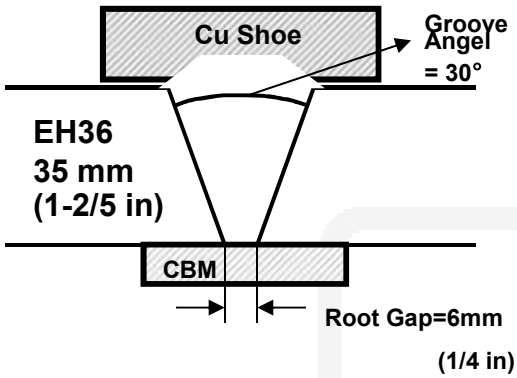
Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions



[Joint Preparation & Layer Details]

Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2
Flow Rate	:	30~35 ℓ /min
Amp./ Volt.	:	380A / 38V
Heat Input	:	247 kJ/cm (627 kJ/in)
Polarity	:	DC(+)
Copper Shoe	:	32(1-1/4 in)
Baking Material	:	DB-3(Dong-il)

❖ Mechanical Properties of all weld metal

CVN Impact Test			
Temp. (℃)	**CVN Impact Test J(ft · lbs)**		
	F.L – 2mm(5/64 in)	***Center***	***F.L. +2mm(5/64 in)***
-20℃(-4°F)	121(89)	111(82)	91(67)
-40℃(-40°F)	81(60)	73(54)	62(46)
-60℃(-76°F)	65(48)	68(50)	52(38)
AWS A5.26 EG82T-NM2 Spec. : ≥27 (-30℃)			

❖ Chemical Analysis of all weld metal(wt%)

Consumables	Tensile Test			C	Si	Mn	P	S	Mo	Ni
	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)							
SC-EG3	572 (83)	640 (93)	23.9	0.068	0.26	1.70	0.013	0.005	0.17	1.47
AWS A5.26 EG82T-NM2	**≥410 (60)**	**550~700 (80~100)**	**≥20**	**≤0.12**	**0.2~ 0.6**	**1.1~ 2.1**	**≤0.03**	**≤0.03**	**0.10- 0.35**	**1.1~ 2.0**

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Mechanical Properties & Chemical Composition of All Weld Metal

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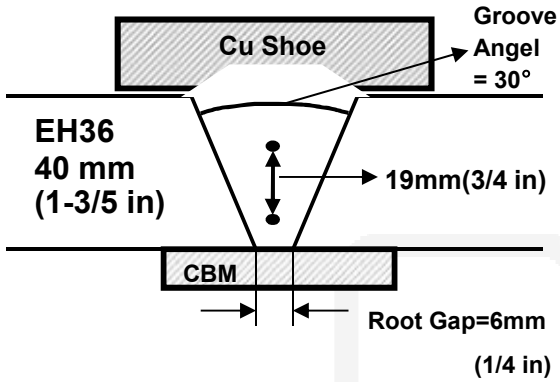

[Joint Preparation & Layer Details]

Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2
Flow Rate	:	30~35 ℓ /min
Amp./ Volt.	:	380A / 38V
Heat Input	:	271 kJ/cm (688 kJ/in)
Polarity	:	DC(+)
Copper Shoe	:	32(1-1/4 in)
Baking Material	:	DB-3(Dong-il)

❖ Mechanical Properties of all weld metal

CVN Impact Test			
Temp. ***(℃)***	**CVN Impact Test J(ft · lbs)**		
	F.L – 2mm(5/64 in)	***Center***	***F.L. +2mm(5/64 in)***
-20℃(-4°F)	99(73)	108(80)	88(65)
-40℃(-40°F)	86(63)	70(52)	72(53)
-60℃(-76°F)	59(44)	62(46)	56(41)
AWS A5.26 EG82T-NM2 Spec. : ≥27 (-30℃)			

❖ Chemical Analysis of all weld metal(wt%)

Consumables	Tensile Test			C	Si	Mn	P	S	Mo	Ni
	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)							
SC-EG3	556 (81)	641 (93)	23.8	0.067	0.28	1.71	0.013	0.005	0.15	1.46
AWS A5.26 EG82T-NM2	**≥410 (60)**	**550~700 (80~100)**	**≥20**	**≤0.12**	**0.2~ 0.6**	**1.1~ 2.1**	**≤0.03**	**≤0.03**	**0.10- 0.35**	**1.1~ 2.0**

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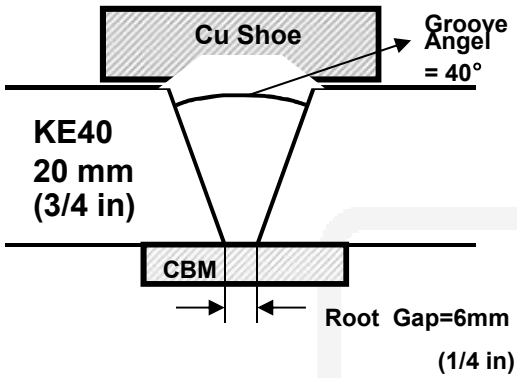
Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions



[Joint Preparation & Layer Details]

Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2
Flow Rate	:	30~35 ℓ /min
Amp./ Volt.	:	350A/ 32V
Heat Input	:	112 kJ/cm (284 kJ/in)
Polarity	:	DC(+)
Copper Shoe	:	28 mm(1.1 in)
Baking Material	:	BS-SG(MABA)

❖ Mechanical Properties of all weld metal

CVN Impact Test			
Temp. (℃)	**CVN Impact Test J(ft · lbs)**		
	F.L – 2mm(5/64 in)	***Center***	***F.L. +2mm(5/64 in)***
-20℃(-4°F)	102(75)	118(87)	99(73)
-40℃(-40°F)	89(66)	92(68)	82(61)
-60℃(-76°F)	72(53)	82(61)	63(46)
AWS A5.26 EG82T-NM2 Spec. : ≥27 (-30℃)			

❖ Chemical Analysis of all weld metal(wt%)

Consumables	Tensile Test			C	Si	Mn	P	S	Mo	Ni
	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)							
SC-EG3	575 (83)	662 (96)	23.8	0.069	0.26	1.74	0.013	0.005	0.17	1.49
AWS A5.26 EG82T-NM2	**≥410 (60)**	**550~700 (80~100)**	**≥20**	**≤0.12**	**0.2~ 0.6**	**1.1~ 2.1**	**≤0.03**	**≤0.03**	**0.10- 0.35**	**1.1~ 2.0**

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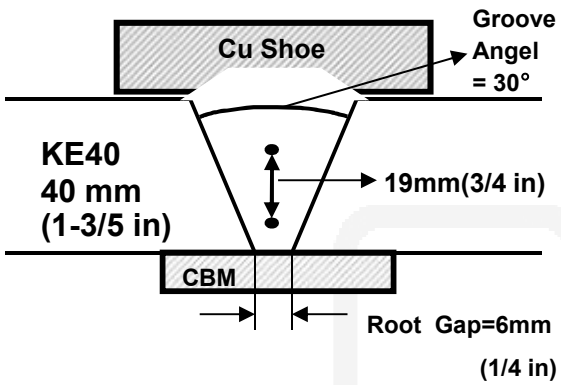
Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions



[Joint Preparation & Layer Details]

Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2
Flow Rate	:	30~35 ℓ /min
Amp./ Volt.	:	380A / 38V
Heat Input	:	271 kJ/cm (688 kJ/in)
Polarity	:	DC(+)
Copper Shoe	:	32(1-1/4 in)
Baking Material	:	BS-SG(MABA)

❖ Mechanical Properties of all weld metal

CVN Impact Test			
Temp. ***(℃)***	**CVN Impact Test J(ft · lbs)**		
	F.L – 2mm(5/64 in)	***Center***	***F.L. +2mm(5/64 in)***
-20℃(-4°F)	100(74)	105(77)	91(67)
-40℃(-40°F)	85(63)	89(66)	78(58)
-60℃(-76°F)	70(52)	75(55)	59(44)
AWS A5.26 EG82T-NM2 Spec. : ≥27 (-30℃)			

❖ Chemical Analysis of all weld metal(wt%)

Consumables	Tensile Test			C	Si	Mn	P	S	Mo	Ni
	YS Mpa(ksi)	TS Mpa(ksi)	EL (%)							
SC-EG3	557 (81)	653 (95)	23.6	0.068	0.28	1.71	0.012	0.005	0.16	1.44
AWS A5.26 EG82T-NM2	**≥410 (60)**	**550~700 (80~100)**	**≥20**	**≤0.12**	**0.2~ 0.6**	**1.1~ 2.1**	**≤0.03**	**≤0.03**	**0.10~ 0.35**	**1.1~ 2.0**

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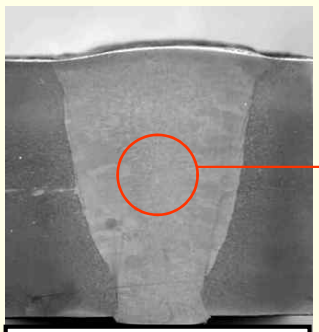
Bead Appearance & Micro Structure

❖ Bead Appearance

Before Slag removal

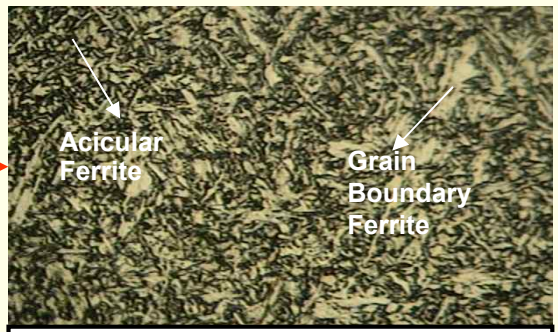
After Slag removal

❖ Macro & Micro Structure



EH36 (40T)

X1200



WELD METAL

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Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.6(1/16in)	**Amps / Volts**	:	360A / 35V
Shielding Gas	:	100%CO_2	**Stick-Out**	:	20~25mm (0.79~0.98in)
Flow Rate	:	25 ℓ /min			
Welding Position	:	1G (PA)	**Welding Speed**	:	30 cm/min (12 in/min)
			Current Type & Polarity	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

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

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
2.4	**2.6**	**2.5**	**2.5**

Average Hydrogen Content 2.5 ㎖ / *100g Weld Metal*

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Proper Welding Condition

❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Amp.(A) / Volt.(V)
			1.6mm(1/16 in)
SC-EG3	100%CO_2	V-Up	330~440A / 32~38V

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Approvals

❖ Shipping Approvals

Welding Position	Register of shipping & Size mm(in)						
	KR	ABS	LR	BV	DNV	GL	NK
V-Up	4Y40VH5 1.6 (1/16in)	5Y400H5 1.6 (1/16in)	4Y40H5 1.6 (1/16in)	AV5Y40HHH 1.6 (1/16in)	VY40H5NV2-4L, NV4-4L 1.6 (1/16in)	6Y40H5V 1.6 (1/16in)	KEW54 Y40G(C)H5 1.6 (1/16in)

* Consumable : SC-EG3 Cored / BS-SG(CO_2)

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