HYUNDAI WELDING

Rev. 00

Supercored 70NS

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

HYUNDAI WELDING CO., LTD.

Supercored 70NS

❖ Specification

AWS A5.18	***E70C-6M***
EN ISO 17632-A	***T 42 2 M M 3 H5***

❖ Applications

Supercored 70NS is used for welding in shipbuilding, machinery, bridge Construction, structural fabrication, automated of robotic welding

❖ Characteristics on Usage

Supercored 70Ns is a metal-cored wire which combines the high deposition rate of FCW with the high efficiencies of solid wire, provides exceptionally smooth and stable arc, low spatter and minimal slag coverage.

❖ Note on Usage

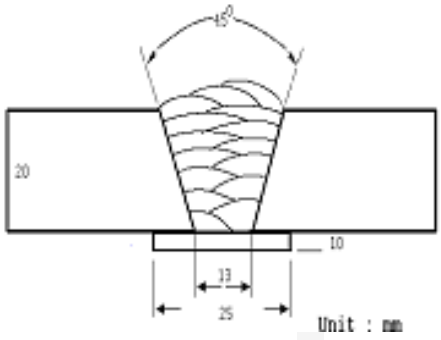
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. One-side welding defects such as hot cracking in may occur with wrong welding parameter such as high welding speed.
3. Use Ar + 20-25% CO_2 gas.

Supercored 70NS

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	***1.2mm***
Shielding Gas	:	Ar + 20%CO_2
Flow Rate(ℓ/min.)	:	20
Amp./ Volt.	:	280 / 29
Stick-Out(mm)	:	20~25
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
Supercored 70NS	YS(MPa)	TS(MPa)	EL(%)	-20℃	-30℃
	480	550	25.0	75	50
AWS A5.18 E70C-6M	≥ 400	≥ 490	≥ 22	≥27J at –30℃	

❖ Chemical Analysis of all weld metal(wt%)

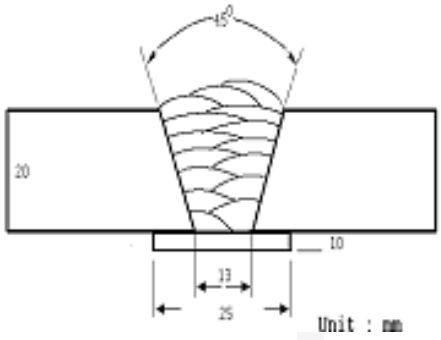
Consumable	C	Si	Mn	P	S
Supercored 70NS	0.05	0.55	1.45	0.011	0.010
AWS A5.18 E70C-6M	***≤ 0.12***	***≤ 0.9***	***≤ 1.75***	***≤ 0.03***	***≤ 0.03***

Supercored 70NS

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	***1.4mm***
Shielding Gas	:	Ar + 20%CO_2
Flow Rate(ℓ/min.)	:	20
Amp./ Volt.	:	300 / 30
Stick-Out(mm)	:	20~25
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
Supercored 70NS	YS(MPa)	TS(MPa)	EL(%)	-20℃	-30℃
	470	535	25.5	70	50
AWS A5.18 E70C-6M	≥ 400	≥ 490	≥ 22	≥27J at –30℃	

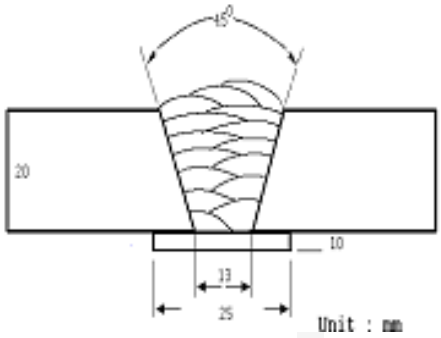
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
Supercored 70NS	0.05	0.54	1.40	0.011	0.010
AWS A5.18 E70C-6M	***≤ 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)	:	***1.6mm***
Shielding Gas	:	Ar + 20%CO_2
Flow Rate(ℓ/min.)	:	20
Amp./ Volt.	:	330 / 30
Stick-Out(mm)	:	20~25
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
Supercored 70NS	YS(MPa)	TS(MPa)	EL(%)	-20℃	-30℃
	475	540	25.5	72	52
AWS A5.18 E70C-6M	≥ 400	≥ 490	≥ 22	≥27J at –30℃	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
Supercored 70NS	0.05	0.55	1.50	0.012	0.010
AWS A5.18 E70C-6M	***≤ 0.12***	***≤ 0.9***	***≤ 1.75***	***≤ 0.03***	***≤ 0.03***

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
Supercored 70NS 1.2mm	200	24	90~92	2.7
	250	28	93~95	4.0
	300	30	95~96	5.4
	350	33	95~96	7.2
Supercored 70NS 1.6mm	350	32	93~95	6.0
	400	34	94~96	7.0
	450	36	95~96	8.1
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 80%Ar+20%CO_2

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.4**	**Amps(A) / Volts(V)**	:	300 / 30
Shielding Gas	:	Ar + 20%CO_2	**Stick-Out(mm)**	:	20~25
Flow Rate(ℓ /min.)	:	20	**Welding Speed**	:	30 cpm
Welding Position	:	1G	**Current Type & Polarity**	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

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

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
4.2	**3.8**	**4.0**	**4.1**

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

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
Supercored 70NS	Ar+20%CO_2	F & HF	230~300Amp	260~340Amp	290~360Amp

Approvals

❖ Shipping Approvals

Welding Position	Register of shipping & Size(mm)						
	KR	ABS	LR	BV	DNV	GL	NK
F,HF V-up	-	3SAH5, 3YSA 0.9~1.6	3S, 3YSH5 0.9~1.6	SA3M, SA3YMHHH 0.9~1.6	IIIYMSH5 0.9~1.6	3YH5S 0.9~1.6	-