HYUNDAI WELDING

Rev. 05

SR-134

SHIELDED METAL ARC WELDING CONSUMABLES
FOR WELDING OF 9% Ni STEELS

HYUNDAI WELDING CO., LTD.

SR-134

❖ Specification

AWS A5.11 ENiCrFe-4

❖ Applications

Welding of 9%Ni steel for cryogenic storage tanks for LNG, Liquified nitrogen, etc.

❖ Characteristics on Usage

SR-134 is an Ni-alloy electrode. Weld metal shows excellent strength and toughness at cryogenic temperatures and meets the specifications of API and NV for the welding of 9%Ni steel. With AC, it permits easy operation free from arc blow.

❖ Note on Usage

AC

❖ Packing

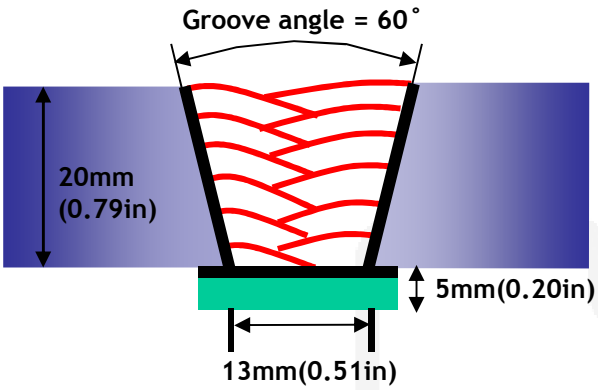
Size mm(in)		3.2(1/8)	4.0(5/32)	5.0(3/16)
Length mm(in)		350(14)	350(14)	350(14)
Amp.	F	80~120	100~150	140~190
	V-up & OH	65~110	90-140	

❖ Approval

Mechanical Properties & Chemical Composition of All Weld Metal (AWS Rules)

❖ Welding Conditions

Method by AWS Rules



[Joint Preparation & Layer Details]

Diameter(mm)	:	4.0 mm(5/32)
Polarity	:	AC
Amp./ Volt.	:	150 / 24
Pre-Heat(℃)	:	R.T .
Interpass Temp.℃(°F)	:	150±15(302±59)

❖ Mechanical Properties of the weld metal

Consumables	Tensile Test Results		CVN Impact Test Joule(ft·lbs)
SR-134	TS MPa(ksi)	El(%)	-196℃(-320°F)
	700(101)	38.0	60(44)
AWS A5.11 ENiCrFe-4	≥650(94)	≥ 20	Not Specified

❖ Chemical Analysis of the weld metal(wt%)

Consumables	Chemical Composition (%)									
	C	Si	Mn	P	S	Ni	Cr	Mo	Nb	Fe
SR-134	0.10	0.5	3.0	0.005	0.005	65.7	15..5	2.4	2.0	10.3
AWS A5.11 ENiCrFe-4	≤0.20	≤1.0	1.0~ 3.5	≤0.03	≤0.02	≥60.0	13.0~ 17.0	1.0~ 3.5	1.0~ 3.5	≤12.0

CTOD Test (9%Ni Steel)

❖Test plate

Item	CTOD Test
Base Metal Groove	ASTM A553 Type 1` 17.5t x 400W x 600L X-Groove (Top : 60°, Bottom : 90°)

❖ Welding Condition

Item	Position	Polarity	Current	Voltage	Preheat Temp.℃(°F)	Interpas Temp.℃(°F)
CTOD Test	V-up	AC	140	-	23(73.4)	40(104) - 135(275)

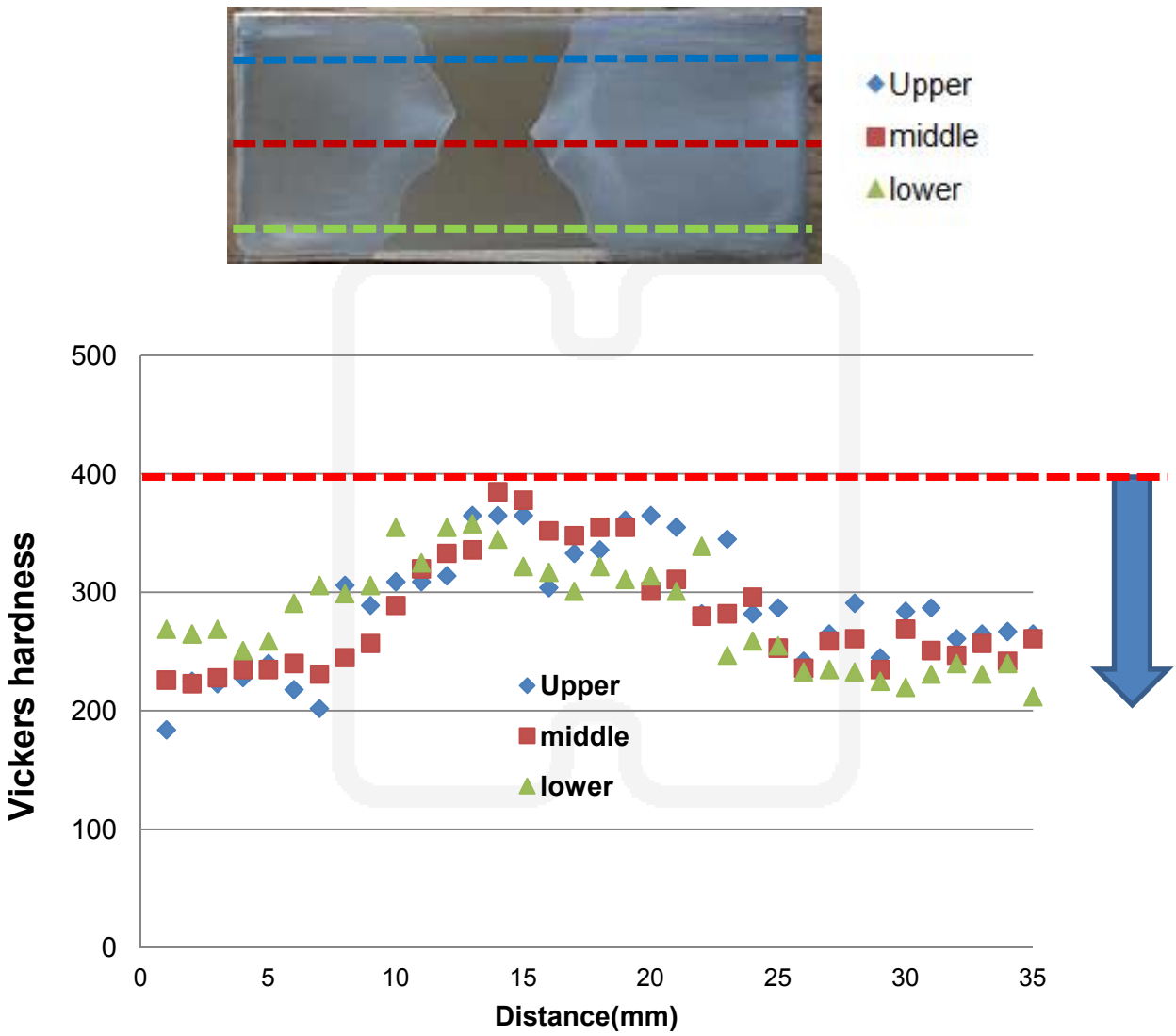
❖Test Result

Item	PWHT	Test Temp ℃(°F)	CTOD Vale mm(in)
Result	AW	-170(-274)	0.30(0.012)
Spec.	AW	-170(-274)	Min 0.17(0.007)

Specimen Type : BS7448 : Part 1 & Part 2
Location of machined notch : at the center of deposited metal
AW = As Welded

Hardness Test (9%Ni Steel)

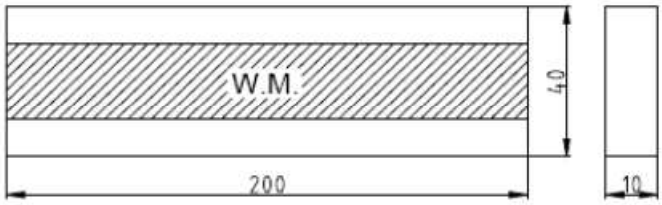
❖ Vickers Hardness Test (Hv10)



Base Metal 9%Ni Steel (17.4T)

Bending test (9%Ni Steel)

❖ Bending Test (Bending Radius: 180°)



(a) Face

(b) Root

Base Metal

9%Ni Steel (15T)

(a) Face

(b) Root

Base Metal

9%Ni Steel (33T)

Bead Appearance

❖ Bead Appearance

V-up (AC)	
SR-134 4.0mm(5/32in)