

# **Supershield 4**

SELF-SHIELD FLUX CORED ARC WELDING CONSUMABLE  
FOR MILD & 490MPa CLASS HIGH TENSILE STEEL

2020.12



## ❖ Specification

*AWS A5.20* E70T-4  
*(AWS A5.20M* E490T-4)

## ❖ Applications

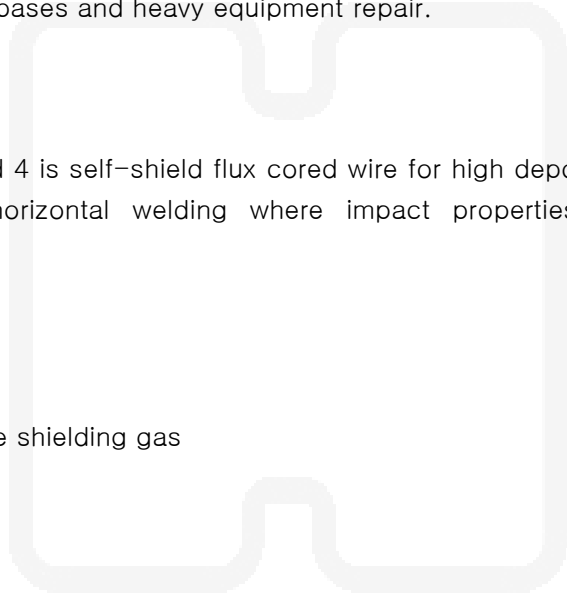
Only Flat, H-Fillet welding of general fabrication, structural fabrication, Machinery bases and heavy equipment repair.

## ❖ Characteristics on Usage

Supershield 4 is self-shield flux cored wire for high deposition rate flat and horizontal welding where impact properties are not required.

## ❖ Note on Usage

Do not use shielding gas

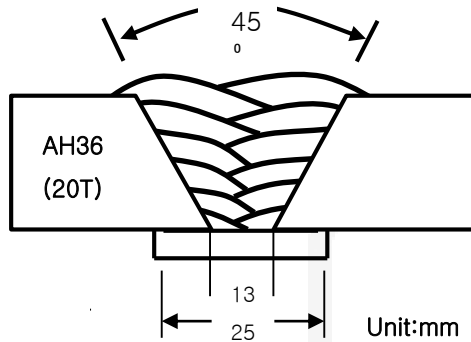




## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

<b>Welding Position</b>	: 1G(PA)
<b>Diameter</b>	: 2.0mm(5/64in)
<b>Shielding Gas</b>	: None
<b>Polarity</b>	: DC+
<b>Amp./ Volt.</b>	: 330 / 29
<b>Stick-Out</b>	: 35~40mm(1.4~1.6in)
<b>Pre-Heat</b>	: R.T .
<b>Interpass Temp.</b>	: 150±15℃ (302±59°F)

### ❖ Mechanical Properties of all weld metal

Consumable	Tensile Test		
	Tensile specimen artificially aged at 105°C for 48hr, as permitted by AWS A5.20		
Supershield 4	YS MPa (lbs/in <sup>2</sup> )	TS MPa (lbs/in <sup>2</sup> )	EL(%)
		442(64,000)	569(83,000)
<b>AWS A5.20 E70T-4</b>	<b>≥ 390 (56,000)</b>	<b>490~670 (70,000~97,000)</b>	<b>≥ 22</b>

### ❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Al
<b>Supershield 4</b>	0.201	0.34	0.35	0.010	0.003	1.12
<b>AWS A5.20 E70T-4</b>	≤ 0.30	≤ 0.60	≤ 1.75	≤ 0.03	≤ 0.03	≤ 1.80

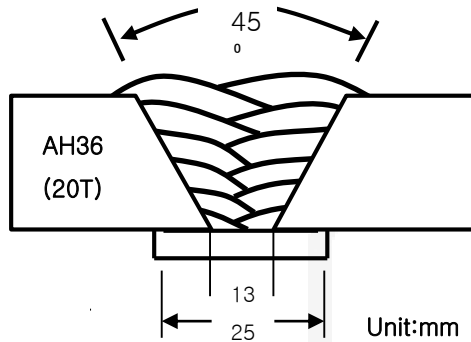
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING CO., LTD. affect the results obtained in applying this type of information. These variables include, but are not limited to, welding procedure, shielding gas, plate chemistry and temperature, weldment design, fabrication methods and service requirements.



## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

<b>Welding Position</b>	: 1G(PA)
<b>Diameter</b>	: 2.4mm(3/32in)
<b>Shielding Gas</b>	: None
<b>Polarity</b>	: DC+
<b>Amp./ Volt.</b>	: 350 / 30
<b>Stick-Out</b>	: 35~40mm(1.4~1.6in)
<b>Pre-Heat</b>	: R.T.
<b>Interpass Temp.</b>	: 150±15℃ (302±59°F)

### ❖ Mechanical Properties of all weld metal

Consumable	Tensile Test		
	Tensile specimen artificially aged at 105°C for 48hr, as permitted by AWS A5.20		
Supershield 4	YS MPa (lbs/in <sup>2</sup> )	TS MPa (lbs/in <sup>2</sup> )	EL(%)
		450(65,000)	580(84,000)
AWS A5.20 E70T-4	≥ 390 (56,000)	490~670 (70,000~97,000)	≥ 22

### ❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Al
Supershield 4	0.210	0.36	0.38	0.011	0.003	1.21
AWS A5.20 E70T-4	≤ 0.30	≤ 0.60	≤ 1.75	≤ 0.03	≤ 0.03	≤ 1.80

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## Welding Efficiency

### ❖ Deposition Rate & Efficiency

Wire Size	Welding Conditions		Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)		
2.0mm (5/64in)	260	28	81~83	4.4 (9.7)
	290	29	81~83	5.3 (11.6)
	320	29	82~84	6.1 (13.4)
	350	30	82~84	7.0 (15.4)
2.4mm (3/32in)	300	29	82~84	5.4 (11.9)
	350	30	82~84	6.6 (14.5)
	400	31	84~86	8.1 (17.8)
	450	31	84~86	9.6 (21.1)
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

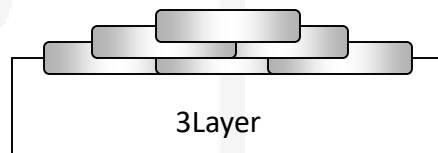
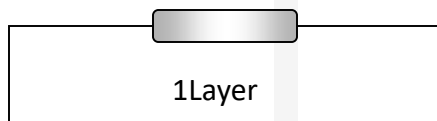


## Hardness of all weld metal

### ❖ Welding Conditions

<b>Diameter</b>	: 2.4mm(3/32in)	<b>Stick-Out</b>	: 35~40mm(1.4~1.6in)
<b>Shielding Gas</b>	: None	<b>Heat Input (Kj/cm)</b>	: 44.5
<b>Current Type &amp; Polarity</b>	: DC(+)	<b>Weld length</b>	: 200 mm(7.87in)
<b>Amp.(A) / Volt.(V)</b>	: 350 / 29	<b>Position of hardness test</b>	: Center of weld bead

### ❖ Test Specimens



### ❖ Result (Hv)

Remark	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
<b>1Layer</b>	<b>226</b>	<b>215</b>	<b>228</b>	<b>210</b>	<b>209</b>	<b>211</b>	<b>212</b>	<b>205</b>	<b>213</b>	<b>208</b>
<b>3Layer</b>	<b>191</b>	<b>197</b>	<b>190</b>	<b>198</b>	<b>198</b>	<b>195</b>	<b>192</b>	<b>183</b>	<b>195</b>	<b>188</b>

**Hardness of Vickers 180~230**



## Proper Welding Condition

### ❖ Proper Current Range

Wire Size	Welding Position	Amp.	Volt.
2.0mm (5/64in)	F & HF	260	28~29
		290	29~31
		320	29~31
		350	30~32
2.4mm (3/32in)	F & HF	300	29~30
		350	30~32
		400	31~32
		450	32~34

### ❖ F No & A No

F No	A No
6	-