

# **Supercored 420MC**

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



## Supercored 420MC

### ❖ Specification

**AWS A5.36**

E71T1-C1A0-CS1  
E71T1-M21A0-CS1

**AWS A5.36M**

E491T1-C1A2-CS1  
E491T1-M21A2-CS1

**(AWS A5.20**

E71T-1C/-1M)

**EN ISO 17632-A**

T 42 2 P C1 1 H10  
T 46 2 P M21 1 H10

### ❖ Applications

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

### ❖ Characteristics on Usage

Supercored 420MC is a titania flux cored wire applicable for all-position welding by 100% CO<sub>2</sub> shielding gas or Ar-20~25% CO<sub>2</sub> shielding gas.

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

### ❖ Note on Usage

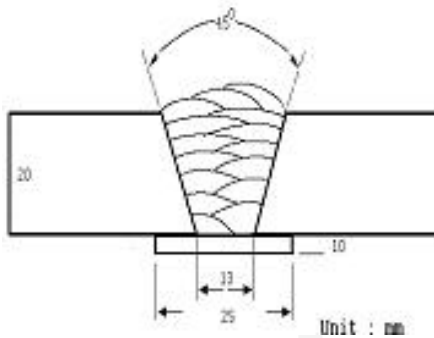
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use 100% CO<sub>2</sub> or Ar-20~25% CO<sub>2</sub> shielding gas



## 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>	: 1.2mm (0.045in)
<b>Shielding Gas</b>	: 100% CO <sub>2</sub> Ar-20%CO <sub>2</sub>
<b>Flow Rate</b>	: 20 ℓ /min
<b>Amp./ Volt.</b>	: 280A / 32V (100% CO <sub>2</sub> ) 280A / 30V (Ar-20%CO <sub>2</sub> )
<b>Stick-Out</b>	: 20~25mm (0.79~0.98in)
<b>Pre-Heat</b>	: R.T (°C, °F)
<b>Interpass Temp</b>	: 150±15°C (302±59°F)
<b>Polarity</b>	: 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 (%)	0°C (32°F)	-20°C (-4°F)
Supercored 420MC	100% CO <sub>2</sub>	520(76)	570(83)	28.0	85(63)	60(44)
	Ar-20% CO <sub>2</sub>	575(83)	630(91)	26.0	106(78)	82(61)
AWS A5.36 E71T1-C1A0(M21A0)-CS1		≥ 400 (58)	490~660 (70~95)	≥ 22	≥ 27J at -20°C (≥ 20ft · lbs at 0°F)	

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

Consumable	Shielding gas	C	Si	Mn	P	S
Supercored 420MC	100%CO <sub>2</sub>	0.040	0.40	1.20	0.010	0.004
	Ar-20%CO <sub>2</sub>	0.040	0.50	1.41	0.010	0.005
AWS A5.36 E71T1-C1A0(M21A0)-CS1		≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

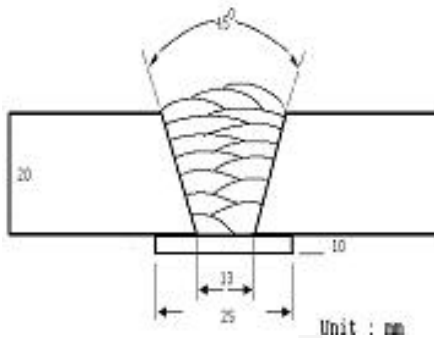
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING 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>	: 1.6mm (1/16in)
<b>Shielding Gas</b>	: 100% CO <sub>2</sub> Ar-20%CO <sub>2</sub>
<b>Flow Rate</b>	: 20 ℓ /min
<b>Amp./ Volt.</b>	: 320A / 32V (100% CO <sub>2</sub> ) 320A / 30V (Ar-20%CO <sub>2</sub> )
<b>Stick-Out</b>	: 20~25mm (0.79~0.98in)
<b>Pre-Heat</b>	: R.T (°C, °F)
<b>Interpass Temp</b>	: 150±15°C (302±59°F)
<b>Polarity</b>	: 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 (%)	0°C (32°F)	-20°C (-4°F)
Supercored 420MC	100% CO <sub>2</sub>	520(76)	580(84)	30.0	92(68)	76(56)
	Ar-20% CO <sub>2</sub>	560(81)	625(91)	28.0	116(86)	93(69)
AWS A5.36 E71T1-C1A0(M21A0)-CS1		≥ 400 (58)	490~660 (70~95)	≥ 22	≥ 27J at -20°C (≥ 20ft · lbs at 0°F)	

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

Consumable	Shielding gas	C	Si	Mn	P	S
Supercored 420MC	100%CO <sub>2</sub>	0.045	0.50	1.35	0.011	0.004
	Ar-20%CO <sub>2</sub>	0.048	0.60	1.50	0.012	0.004
AWS A5.36 E71T1-C1A0(M21A0)-CS1		≤ 0.12	≤ 0.9	≤ 1.75	≤ 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 <sub>2</sub>	280	32	12.7(500)	86~88	4.8(11)
	Ar-20%CO <sub>2</sub>	280	30	12.7(500)	87~89	5.0(11)
1.6mm (1/16 in)	100%CO <sub>2</sub>	330	32	8.3(325)	86~88	5.3(12)
	Ar-20%CO <sub>2</sub>	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

## Proper Welding Condition

### ❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.	
			1.2mm (0.045 in)	1.6mm (1/16 in)
Supercored 420MC	100%CO <sub>2</sub> or Ar-20~25%CO <sub>2</sub>	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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## Diffusible Hydrogen Content

### ❖ Welding Conditions

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

### ❖ Hydrogen Analysis Using Gas Chromatography Method

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

### ❖ Result(ml/100g Weld Metal)

	X1	X2	X3	X4
<b>100% CO<sub>2</sub></b>	<b>6.6</b>	<b>6.7</b>	<b>6.4</b>	<b>6.3</b>
<b>Ar-20%CO<sub>2</sub></b>	<b>7.6</b>	<b>7.9</b>	<b>7.4</b>	<b>7.5</b>

**Average Hydrogen Content 6.5 ml / 100g Weld Metal (100% CO<sub>2</sub>)**

**Average Hydrogen Content 7.6 ml / 100g Weld Metal (Ar-20% CO<sub>2</sub>)**

### ❖ F No & A No

F No	A No
6	1