

Flux Cored Wire (FCW)



Welding Consumables Selection

Product name	Specification	Characteristic description
GMX70	E70T-1C	CO ₂ , DC+, high deposition rate titania type, only for flat and horizontal fillet welding positions.
GMX71	E71T-1C	CO ₂ , DC+, titania type, good for full positions.
GMX71M	E71T-1M	(75~80%Ar+20~25%CO ₂) mixing gas, DC+, titania type, good for full positions.
GMX71Ni	E71T-9C(J)	CO ₂ , DC+, titania type, good for full positions (less than 1.6mm).
MXC760C	E70C-6C	CO ₂ , DC+, good for flat and horizontal fillet welding positions.
MXC760	E70C-6M	(75~80%Ar+20~25%CO ₂) mixing gas, DC+, composite type, good for flat and horizontal fillet welding positions.

Recommended welding parameters

Wire diameter (mm)	Current (A)	Voltage(V)	Wire stick out (mm)
1.2	120~350	20~30	20~25
1.4	160~380	22~34	
1.6	200~450	24~36	

GOODWELD produces two types of High Tensile Strength Steels using FCAW wire.

One is GMX which is flux cored type and the other is MXC which is composite type with metal cored. Both types can use either CO_2 or $\text{CO}_2 + \text{Ar}$ as shielding gas.

The characteristics are described as follows:

GMX type :

It is a slag type FCAW wire. Almost flux is converted into slag through welding operation, high performance characteristics ability such as arc stable and low welding spatter, easy slag removal and good bead appearance no matter CO_2 or $\text{CO}_2 + \text{Ar}$ is used as shielding gas. It is suitable for full positions welding.

MXC type :

It is a non slag composite type metal cored wire with high deposition efficiency; it has similar high performance characteristics ability such as arc stable and low welding spatter as GMX type wire especially when mixing gas is used. Like solid wire, a slight amount of slag is produced after welding but it is more easy to remove. The application is similar to solid wire, suitable for all thickness steels and good for flat and horizontal positions.

Deposition Rate

For comparing similar mechanical level welding materials, flux cored wire not only has the deposition rate 1~5 times higher than traditional coated electrodes and 10~20% higher than solid wires, with lower spatters. It is widely preferred by welders.

The following welding notes are references for flux cored wire welding :

1. Flux cored wire is more soft than solid wire; proper adjustment of wire feed roller pressure is necessary and important for preventing wire deformation or damage to cause unstable feeding.
2. Backhand welding technique is recommended for heavy work root pass to get good penetration. Forehand welding technique is recommended for thin work or when appearance is important.
3. Vertical downward position is not recommended for heavy work root pass.
4. Welding parameters listed in WPS shall be followed but the range shall be limited to the product recommended range so as to prevent hot cracking.
5. The selection of proper wire size should be in accordance with work size.
6. The polarity illustration :
 - DCEP (DC+) : Electrode positive or DC reverse polarity.
 - DCEN (DC-) : Electrode negative or DC straight polarity.

GMX 70

AWS A5.20M E490T-1C
A5.20 E70T-1C
JIS Z3313 T49J2T1-0CA- H10

Product Features:

- High titania oxide type flux cored arc welding wire, high deposition efficiency.
- High deposition efficiency and Deep penetration, suitable for flat butt and horizontal fillet welding.
- Good crack resistance and mechanical properties.
- Good arc stability, less spatter loss.
- Easy slag removal.

Applications:

- Suitable for welding of mild and 490 N/mm² high tensile strength steel structures on shipbuilding, buildings, bridges, machinery, heavy thickness steel castings and pressure vessels.

Typical chemical composition of all-weld metal (wt%)

C	Si	Mn	P	S
0.06	0.44	1.5	0.022	0.008

Typical mechanical properties of all-weld metal

Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation %	Impact value (-20°C) J
563	605	26.2	77.1

Welding parameters

Diameter (mm)		1.2	1.4	1.6
Polarity		DC+	DC+	DC+
Ampere (A)	Flat, horizontal fillet and horizontal position	120~350	160~380	200~450
Shielding Gas		CO ₂	CO ₂	CO ₂

- © Note: 1. Wire extension : 15~25mm (standard range).
2. Shielding gas flow rate : 20~25 L/min.
3. Refer to page A40 FCW welding notes.

Product Features:

- Titania oxide type CO₂ Gas shield flux cored arc welding wire.
- Good bead appearance.
- Good crack resistance and mechanical properties.
- Good arc stability, less spatter loss and easy slag removal.

Applications:

- Suitable for welding of mild and 490 N/mm² high tensile strength steel structures on shipbuilding, buildings, bridges, machinery, heavy thickness steel castings and pressure vessels.

Typical chemical composition of all-weld metal (wt%)

C	Si	Mn	P	S
0.04	0.40	1.33	0.020	0.010

Typical mechanical properties of all-weld metal

Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation %	Impact value (-20°C) J
555	592	26	59

Welding parameters

Diameter (mm)		1.2	1.4	1.6
Polarity		DC+	DC+	DC+
Ampere (A)	Flat, horizontal position	120~350	160~380	200~450
	Vertical upward position	120~250	150~260	180~280
	Vertical downward position	200~280	220~280	250~280
Shielding Gas		CO ₂	CO ₂	CO ₂

- © Note: 1. Wire extension : 15~25mm (standard range).
2. Shielding gas flow rate : 20~25 L/min.
3. Refer to page A40 FCW welding notes.



GMX 71M

AWS A5.20M E491T-1M
A5.20 E71T-1M
JIS Z3313 T49J2T1-1MA-H10

Product Features:

- Titania oxide type flux cored wire for welding with Ar+CO₂ mixed shielding gas.
- Good bead appearance.
- Good crack resistance and mechanical properties.
- Good arc stability, less spatter loss and easy slag removal.

Applications:

- Suitable for welding of mild and 490 N/mm² high tensile strength steel structures on shipbuilding, buildings, bridges, machinery, heavy thickness steel castings and pressure vessels.

Typical chemical composition of all-weld metal (wt%)

C	Si	Mn	P	S
0.04	0.35	1.28	0.020	0.010

Typical mechanical properties of all-weld metal

Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation %	Impact value (-20°C) J
560	591	28.4	71

Welding parameters

Diameter (mm)		1.2	1.6
Polarity		DC+	DC+
Ampere (A)	Flat, horizontal position	120~350	200~450
	Vertical upward position	120~250	180~280
	Vertical downward position	200~280	250~280
Shielding Gas		80%Ar+20%CO ₂	80%Ar+20%CO ₂

- © Note: 1. Wire extension : 15~25mm (standard range).
2. Shielding gas flow rate : 20~25 L/min.
3. Refer to page A40 FCW welding notes.

Product Features:

- Titania oxide type flux cored wire for welding of mild and 490N/mm² high tensile strength steel with CO₂ shielding gas.
- Good bead appearance.
- Few spatters and easy slag removal.
- Ni element contained for improving low temperature impact toughness and crack resistance.

Applications:

- Suitable for welding of mild and 490 N/mm² high tensile strength steel structures on shipbuilding, buildings, bridges, machinery, heavy thickness steel castings and pressure vessels.

Typical chemical composition of all-weld metal (wt%)

C	Si	Mn	P	S	Ni
0.05	0.42	1.32	0.020	0.007	0.44

Typical mechanical properties of all-weld metal

Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation %	Impact value (-30°C) J	Impact value (-40°C) J
620	639	27.0	103.6	80

Welding parameters

Diameter (mm)		1.2	1.6
Polarity		DC+	DC+
Ampere (A)	Flat, horizontal position	120~350	200~450
	Vertical upward position	120~250	180~280
	Vertical downward position	200~280	250~280
Shielding Gas		CO ₂	CO ₂

- © Note: 1. Wire extension : 15~25mm (standard range).
2. Shielding gas flow rate : 20~25 L/min.
3. Refer to page A40 FCW welding notes.



MXC 760C

AWS A5.18M E48C-6C
A5.18 E70C-6C

Product Features:

- Composite wire for welding of mild and 490 N/mm² high tensile strength steel with CO₂ shielding gas.
- High welding performance, almost no spatter loss.
- Very few slag and easy removed, more higher deposition efficiency than similar strength level solid wires.
- Low hydrogen contained in weld metal to get good mechanical properties, crack resistance and impact toughness.

Applications:

- Suitable for welding of mild and 490 N/mm² high tensile strength steel structures on shipbuilding, buildings, bridges, machinery, heavy thickness steel castings and pressure vessels.

Typical chemical composition of all-weld metal (wt%)

C	Si	Mn	P	S
0.05	0.65	1.5	0.013	0.008

Typical mechanical properties of all-weld metal

Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation %	Impact value (-30°C) J
510	578	29.6	78

Welding parameters

Diameter (mm)		1.2	1.6
Polarity		DC+	DC+
Ampere (A)	Flat, horizontal position	120~350	200~450
	Vertical upward position	120~250	180~280
	Vertical downward position	200~280	250~280
Shielding Gas		CO ₂	CO ₂

- © Note: 1. Wire extension : 15~25mm (standard range).
2. Shielding gas flow rate : 20~25 L/min.
3. Refer to page A40 FCW welding notes.

Product Features:

- Composite wire for welding of mild and 490 N/mm² high tensile strength steel with Ar + CO₂ mixed shielding gas.
- High welding performance, almost no spatter loss.
- Very few slag and easy removed, more higher deposition efficiency than similar strength level solid wires.
- Low hydrogen contained in weld metal to get good mechanical properties, crack resistance and impact toughness.

Applications:

- Suitable for welding of mild and 490 N/mm² high tensile strength steel structures on shipbuilding, buildings, bridges, machinery, heavy thickness steel castings and pressure vessels.

Typical chemical composition of all-weld metal (wt%)

C	Si	Mn	P	S
0.06	0.39	1.48	0.010	0.010

Typical mechanical properties of all-weld metal

Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation %	Impact value (-30°C) J
482	540	29.2	62

Welding parameters

Diameter (mm)		1.2	1.6
Polarity		DC+	DC+
Ampere (A)	Flat, horizontal position	120~350	200~450
	Vertical upward position	120~250	180~280
	Vertical downward position	200~280	250~280
Shielding Gas		80%Ar+20%CO ₂	80%Ar+20%CO ₂

- © Note: 1. Wire extension : 15~25mm (standard range).
2. Shielding gas flow rate : 20~25 L/min.
3. Refer to page A40 FCW welding notes.