

## Characteristics and Applications:

TN-28 is an iron-powder low hydrogen type electrode for the welding of low temperature service steel. Due to consist of 2.5% Ni, the impact toughness at -60°C is excellent. TN-28 is an excellent all-position electrode with stable arc, small spatter and good slag protection. TN-28 produces weld metals with less hydrogen, excellent resistance to brittle fracture and good mechanical properties. The deposition rate will be increased because of much iron powder contained in the coating. Its features make the product being applied to shipbuilding, structural fabrication, bridge structure, pressure vessel and suitable for high carbon steels, low Mn alloy steels, high tensile (540-610 N/mm<sup>2</sup>) steels, cast steels, low temperature steel pipes, aluminum killed steels, ASTM A352 Gr.LC2/A420 Gr.WPL9/A707 Gr.L4/A757 Gr.B2N.

## Notes on usage:

1. Be sure to clean up the contaminations on the base metal to avoid porosity and crack.
2. Dry the electrodes at 350-400°C for 60 minutes before use.
3. Take the back-step method to prevent blowholes at the arc starting.
4. Maintain short arc length. Moving range should be controlled within 3 times of the wire's dia when you are welding with weave method.
5. Do not exceed the range of proper currents. That might decrease the impact toughness.
6. Pre-heat at 50~100°C while in welding thick plate.

## Typical chemical composition of weld metal (wt%):

	C	Mn	Si	P	S	Ni	Mo	Cr	V	Nb	Cu
AWS	≤0.12	≤1.25	≤0.80	≤0.03	≤0.03	2.00-2.75	-	-	-	-	-
EN ISO	-	≤1.4	-	-	-	1.8-2.6	≤0.02	≤0.2	≤0.05	≤0.05	≤0.3
Typical value	0.05	1.03	0.21	0.01	0.004	2.4	0.002	0.025	0.015	0.004	0.005

## Typical mechanical properties of weld metal:

	Yield strength MPa(ksi)	Tensile strength MPa(ksi)	Elongation %	Charpy V-Notch J (ft-lbf) -60°C (-75°F)	PWHT
AWS	≥460(67)	≥550(80)	≥19	≥27(20)	605°C x1hr
EN ISO	≥460(67)	530-680(77-99)	≥17	≥47(35)	-
Typical value	550(80)	630(91)	30	70(52)	605°C x1hr

## Welding position



## Sizes and recommended operating range (AC or DC<+>):

Diameter (mm)		3.2	4.0	5.0
Length (mm)		350	450	450
Current (Amps)	F	100-140	140-180	180-230
	V&OH	80-110	130-160	-

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