

# TNM-9

AWS A5.11 ENiCrMo-6  
EN ISO 14172 E Ni 6620

## Characteristics and Applications:

TNM-9 is designed for AC and DC welding with chemical composition of 65Ni, 14.5Cr, 7Fe, 7Mo, 3Mn, 1.5W, 1.5Nb. It is suitable for all-position welding with excellent weldability for electrodes 3.2mm and less in size and for 5%Ni & 9%Ni steel joining of storage tank application of LNG or liquefied Nitrogen, stabilized, non-stabilized Austenitic (Cr Ni) steels and cryogenic Ni steel with quenching and tempering. Proper base metals are including ASTM B333/334/353/522/553.

## Notes on usage:

1. Be sure to clean up the contaminations on the base metal, groove and pass to pass with stainless steel brush.
2. Dry the electrodes at 350~400°C for 60 minutes before use. Take out a batch of half day consumption and keep at 100~150°C during welding process.
3. Use back-step method to prevent arc starting from blowholes and hold for 3-5 seconds at every end-up.
4. Maintaining short arc length as possible is highly recommended to prevent porosity problem.
5. Do not exceed the range of recommended current. Over heat input might decrease the impact value.
6. Crater should be ground smoothly or by crater treatment.

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

	C	Mn	Si	Cr	Mo	Ni	Nb+Ta	W	Fe
AWS	≤0.10	2.0-4.0	≤1.0	12.0-17.0	5.0-9.0	≥55.0	0.5-2.0	1.0-2.0	≤10.0
EN ISO	≤0.10	2.0-4.0	≤1.0	12.0-17.0	5.0-9.0	≥55.0	(Nb)0.5-2.0	1.0-2.0	≤10.0
Typical value	0.04	3.1	0.4	14.0	7.00	67	1.30	1.50	5.00

## Typical mechanical properties of weld metal:

	Yield strength MPa(ksi)	Tensile strength MPa(ksi)	Elongation %	Charpy V-Notch J (ft-lbf) -196°C (-320°F)
AWS	-	≥620(90)	≥35	-
EN ISO	≥350(51)	≥620(90)	≥32	-
Typical value	440(64)	700(102)	43	70(52)

## Welding position:



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

Diameter (mm)	2.6	3.2	4.0	4.8
Length (mm)	300	300   350	350	350
Current (Amps)	F	90-120	110-130	160-200   200-250
	V&OH	70-90	80-110	110-150   -

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