Thermanit MTS 911

Solid wire, creep resistant

Classifications

EN ISO 21952-A	AWS A5.28 / SFA-5.28
GZ CrMoWVNb 9 1 1	ER90S-G (ER90S-B9(mod.))

Characteristics and typical fields of application

Thermanit MTS 616 is a solid filler wire electrode for gas metal arc welding. The 9Cr-1.8W-0.5Mo-V-Nb type weld metal exhibits a fully tempered martensitic microstructure with favorable mechanical properties in post weld heat treated condition. The range of application covers joint welding of similar alloyed creep strength enhanced ferritic steels like ASTM grade 92 tube, pipe, plate and forgings used in the thermal power industry. Thanks to the controlled Mn+Ni content, the A_{c1} Temperature is certainly above 780 ºC.
The chemical composition of Thermanit MTS 616 is optimized in order to provide a high creep resistant and ductile weld metal after post weld heat treatment along with low level of trace elements.

Base materials

Similar alloyed creep resistant steels and castings like
1.4901 – X10CrWMoVNb9-2
ASTM A213 Gr. T 92; A355 Gr. P92; A187 F92, A369 FP92; A1017 Gr 92
KA-STBA29; KA-STPA29
NF 616

Typical analysis

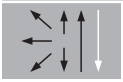
	C	Si	Mn	Cr	Ni	Mo	W	V
wt.-%	0.1	0.3	0.5	9	0.5	1.0	1	0.2

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$	Tensile strength R_m	Elongation A (L_0=5d_0)	Impact energy ISO-V KV J
	MPa	MPa	MPa	20 °C
s	620 (≥ 560)	760 (≥ 720)	18 (≥ 15)	60 (≥ 41)

s heat treated, tempered (760 °C / 4 h / Argon + 2.5 % CO_2)

Operating data



Polarity	DC +
Shielding gas (EN ISO 14175)	M12 (M13)

Dimension mm
1.2

Preheat and interpass temperature should be controlled between 200 and 300 ºC. In order to optimize impact energy, a multi-layer welding technique that ensures small layer thickness and low heat input is recommended. In order to optimize impact energy a welding technique that ensures small layer thickness and low heat input is recommended. After welding the weld seam must be cooled below 100 ºC in order to complete the martensitic transformation prior to PWHT which is typically carried out between 750 and 770 ºC for at least 2 h The un-tempered martensitic microstructure is very sensitiv to cold and stress corrosion cracking. Residual welding and external stresses must be reduced to a minimum. Any exposure to moisture must be avoided in the as welded condition. Keeping a temperature above the dew point or storage in humidity controlled atmosphere is highly recommended bridging the gap between welding and final PWHT. For heavy wall components conducting a dehydrogenating heat treatment between 260 and 400 ºC before cooling down to room temperature can be recommended.

Approvals

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