Thermanit 19/15

Solid wire, high-alloyed, austenitic stainless

Classifications

EN ISO 14343-A	AWS A5.9 / SFA-5.9
G 20 16 3 Mn N L	ER316LMn

Characteristics and typical fields of application

Solid wire of G 20 16 3 Mn N L / ER316L (mod.) type for joining and surfacing applications with matching and similar austenitic CrNi(N) and CrNiMo(Mn,N)-steels. Corrosion resistance similar to low-carbon CrNiMo(Mn,N)-steels and cast steel grades. Seawater resistant, good resistance to nitric acid, selective attack max. 200 µm. Non-magnetic (permeability in field of 8000 A/m max. µr 1.01). Particularly suited for corrosion conditions in urea synthesis plants for welding work on steel X2CrNiMo18-12. Resulting all-weld metal microstructure is austenite with max. 0.6% ferrite. Max. service temperature 350ºC.

Base materials

1.3941 (G)X4CrNi18-3, 1.3945 X2CrNiN18-13, 1.3948 X4CrNiMnMoN19-13-8, 1.3952 (G)X2CrNiMoN18-14-3 1.3953 (G)X2CrNiMo18-15, 1.3955 GX12Cr18-11, 1.3965 X8CrMnNi18-8, 1.4315 X5CrNiN19-9, 1.4429 X2CrNiMoN17-13-3 1.4561 X1CrNiMoTi18-13-2, 1.6903 10CrNiTi18-10
Cryogenic 3.5 – 5% Ni-steels
UNS S31653, AISI 316LN

Typical analysis

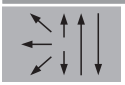
	C	Si	Mn	Cr	Ni	Mo	N
wt.-%	0.03	0.5	7.5	20.5	15.5	3.0	0.18

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	%	-196°C
u	430 (≥ 320)	650 (≥ 510)	30 (≥ 25)	≥ 47

u untreated, as-welded – shielding gas Ar + 2.5% CO_2

Operating data



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

Dimension mm
1.0
1.2

Suggested heat input max. 1.5 kJ/mm and interpass temperature max. 100ºC.
When cladding high temperature and cast steel grades, preheating is according to the parent material (150ºC). In case if excessive hardening of the parent material, stress relieving can be performed at 510ºC for max. 20 h, annealing above 530ºC only prior to the final pass.
Shielding gas: Ar + 2 – 3% CO_2, Ar + 1 – 2% O_2

Approvals

TÜV (10267), DB (43.132.12), DNV, CE