Thermanit 686

Solid wire high-alloyed, nickel-base

Classifications

EN ISO 18274	AWS A5.14 / SFA-5.14
S Ni 6686 (NiCr21Mo16W4)	ERNiCrMo-14

Characteristics and typical fields of application

Solid wire of S Ni 6686 (NiCr21Mo16W4) / ERNiCrMo-14 type for joining and surfacing work with matching / similar corrosion resistant materials as well as with matching and similar heat resistant alloys. For joining and surfacing work on cryogenic austenitic CrNi(N)-steels and cast steel grades and on cryogenic Ni-steels suitable for quenching and tempering. High resistance to corrosive environment. Resistant to stress corrosion cracking. Service temperature limit max. 500ºC in sulfurous atmospheres, otherwise heat resistant up to 900ºC. Good toughness at subzero temperatures as low as -196ºC. High corrosion resistance in reducing and oxidizing environments.

Base materials

2.4602 NiCr21Mo14W, 2.4605 NiCr23Mo16Al, 2.4606 NiCr21Mo16W, 2.4819 NiMo16Cr15W
UNS N06022, N06059, N06686, N10276
Alloy 22, Alloy 59, Alloy 686, Alloy C-276
16Mo3

Typical analysis

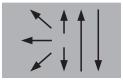
	C	Si	Mn	Cr	Ni	Mo	W	Fe	Al
wt.-%	0.01	0.08	< 0.5	22.8	Bal.	16.0	3.8	< 1.0	0.3

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	%	20°C
u	450	760	30	50

u untreated, as-welded – shielding gas Ar + 30% He + 2% H_2 + 0.1% CO_2

Operating data



Polarity	DC+	Dimension mm
Shielding gas (EN ISO 14175)	I1 Ar + 30% He + 2% H2 + 0.1% CO2	1.0 1.2

To minimize the risk of hot cracking when welding fully austenitic and nickel-base alloys, heat input and interpass temperature must be low and there must be as little dilution as possible from the parent metal. Suggested heat input is max. 1.0 kJ/mm and interpass temperature max. 100ºC.
Post-weld heat treatment generally not needed. In special cases, solution annealing can be performed at 1180ºC followed by water quenching.
For MIG welding: Polarity DC+. Shielding gas: Ar + 30% He + 2% H_2 + 0.1% CO_2 and pulsed arc. Gas flow: 15 – 20 l/min.
For automatic TIG welding: Polarity DC-. Shielding gas: Ar. Gas flow: 5 – 12 l/min.

Approvals

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