

Heat-resistant and corrosion-resistant alloys

Nimofor 6928 – alloy B-2			Nicrofer 3220 HT – alloy 800 HT			Nicrofer 6023 – alloy 601		
Sheet/strip	Tube/pipe	Rod/bar	Sheet/strip	Tube/pipe	Rod/bar	Sheet/strip	Tube/pipe	Rod/bar

DESIGNATIONS AND SPECIFICATIONS

D	Designation	NiMo28	X 8 NiCrAlTi 32 21	NiCr23Fe
	Material N.	2.4617	1.4959	2.4851
	VdTÜV	436	310	-
USA	UNS	N 10665	N 08811	N 06601
	ASTM(B) ASME(SB)	333	409	168
GB	Designation BS	-	-	-
	BS	-	-	-
F	AFNOR	NiMo 28	-	NC 23 FeA

CHEMICAL COMPOSITION (%)

Nickel	Balance	30 - 32	58 - 63
Chromium	0.4 - 1	19 - 22	22 - 24
Iron	1.5 - 2	Balance	Balance
Silicon	Max. 0.08	0.2 - 0.6	Max. 0.5
Others	Mo: 26 - 30 Co: Max. 1	Al: 0.3 - 0.6	Al: 1.1 - 1.6
Titanium	-	0.3 - 0.6	0.1 - 0.4
Carbon	Max. 0.01	0.06 - 0.1	0.03 - 0.08

MECHANICAL PROPERTIES (N/mm², %)

Temperature (°C)	Rp 0.2	Rp 1.0	Rm	A5	Rp 0.2	Rp 1.0	Rm	A5	Rp 0.2	Rp 1.0	Rm	A5
20	Min. 350	Min. 380	Min. 760	Min. 40	Min. 170	Min. 200	Min. 500	Min. 35	Min. 300	Min. 330	Min. 650	Min. 30
100	Min. 315	Min. 355	-	-	Min. 140	Min. 160	-	-	440	-	750	40
200	Min. 285	Min. 325	-	-	Min. 115	Min. 135	-	-	430	-	740	70
300	Min. 270	Min. 310	-	-	Min. 95	Min. 115	-	-	400	-	730	35
400	Min. 255	Min. 295	-	-	Min. 85	Min. 105	-	-	370	-	700	35
500	Min. 230	-	-	-	Min. 80	Min. 100	-	-	350	-	670	40
600	-	-	-	-	Min. 75	Min. 95	-	-	320	-	580	40

CREEP PROPERTIES (N/mm²)

Temperature (°C)	Rp 1.0/10 ⁴	Rm/10 ⁴	Rp 1.0/10 ⁵	Rm/10 ⁵	Rp 1.0/10 ⁴	Rm/10 ⁴	Rp 1.0/10 ⁵	Rm/10 ⁵	Rp 1.0/10 ⁴	Rm/10 ⁴	Rp 1.0/10 ⁵	Rm/10 ⁵
700	-	-	-	-	59	73	40	57	-	-	-	-
800	-	-	-	-	30	41	19	26	-	-	-	-
900	-	-	-	-	13	18	6.7	11.2	-	-	-	-
950	-	-	-	-	8.2	12	3.9	7.2	-	-	-	-
1000	-	-	-	-	4.4	7.9	1.9	4	-	-	-	-

PHYSICAL PROPERTIES AT ROOM TEMPERATURE OR AS INDICATED

Density	g/cm ³	9.2	8.0	8.1
Specific heat	J/Kg K	377	472	450
Thermal conductivity	W/m K	11.4	11.5	11.3
Electrical resistivity	μΩ	137	101	119
Thermal expansion	10 ⁻⁶ /K	11.1	16.2	14.6
20-300°C				
Modulus of elasticity	kN/mm ²	217	194	207

FABRICATION CHARACTERISTICS

Formability	Good	Good	Good
Weldability	Good	Satisfactory	Satisfactory

WELDING PRODUCTS

Filler wire	Nimofor S 6928 - FM B-2	Nicrofer S 7020 - FM 82	S 6020 - FM 625	Nicrofer S 6023 - FM 601 ¹	S 7020 - FM 82
Covered electrode	2.4616	2.4648	2.4621	2.4648	2.4648
	EL-NiMo29	AWS ENiMo-7	EL-NiCr19Nb	EL-NiCr20Mo9Nb	EL-NiCr19Nb
			AWS ENiCrMo-3	AWS ENiCrMo-3	

MATERIAL DESCRIPTION, MAIN CHARACTERISTICS

Nickel-molybdenum alloy with very low carbon and silicon contents to ensure good corrosion behaviour even in the welded condition. Excellent resistance to stress-corrosion cracking, pitting and knifeline attack. Particularly resistant to reducing media, such as hydrochloric acid, even at high temperature.

Grade of Nicrofer 3220 H - alloy 800 with higher total aluminum and titanium contents, for maximum creep strength in the temperature range 700-1000°C (1290-1830°F). Not for long-time service below 700°C (1290°F).

Nickel-chromium-iron alloy with aluminum and titanium additions. Particularly high resistance to oxidation up to about 1150°C (2100°F). Good carburization resistance.

1) Up to 10 mm thickness and cover layer