

Corrosion-resistant alloys

VDM LC-Nickel 99.2 – alloy 201				Nicrocorros – alloy 400			Nicrocorros Al – alloy K-500		
	Sheet/strip	Tube/pipe	Rod/bar	Sheet/strip	Tube/pipe	Rod/bar	Sheet/strip	Tube/pipe	Rod/bar

DESIGNATIONS AND SPECIFICATIONS

D	Designation	LC-Ni 99			NiCu30Fe				NiCu30Al
	Material N.	2.4068			2.4360				2.4375
	VdTUV	345	345	345	263	263	263	-	-
USA	UNS	N 02201			N 04400				N 05500
	ASTM(B) ASME(SB)	162	161/163	160	127	163/165	164	-	-
GB	Designation BS	NA12			NA13				NA18
	BS	3072/3073	3074	3076	3072/3073	3074	3076	3072/3073	3074 3076
F	AFNOR	-			NU 30				NU 30 AT

CHEMICAL COMPOSITION (%)

Nickel		Min. 99			Min. 63			Min. 63
Manganese		Max. 0.3			Max. 1.25			Max. 1.5
Aluminum		-			Max. 0.5			2.3 - 3.15
Iron		Max. 0.4			1 - 2.5			0.5 - 2
Magnesium		Max. 0.05			-			-
Copper		Max. 0.25			28 - 34			27 - 33
Titanium		-			Max. 0.3			0.35 - 0.85
Carbon		Max. 0.02			Max. 0.15			Max. 0.25

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. 80	Min. 105	Min. 340	Min. 40	Min. 175	Min. 205	Min. 450	Min. 30	Min. 690	-	Min. 965	Min. 20
100	Min. 70	Min. 95	290	40	Min. 150	220	420	30	740	-	1050	24
200	Min. 65	Min. 90	275	40	Min. 135	210	390	30	700	-	1025	23
300	Min. 60	Min. 85	260	45	Min. 130	190	380	30	660	-	975	23
400	Min. 55	Min. 80	240	55	Min. 130	180	370	30	640	-	880	10
500	Min. 50	Min. 75	210	60	Min. 130 ¹	-	360 ¹	30 ¹	-	-	-	-
600	Min. 40	Min. 65	150	75	Min. 400 ²	-	Min. 580 ²	Min. 18 ²	Min. 620 ³	-	Min. 895 ³	Min. 20 ³

CREEP PROPERTIES (N/mm²)

Temperature (°C)	Rp 1.0/10 ³	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
300	110	260	95	238	-	-	-	-	-	-	-	-
400	75	159	60	145	150	280	130	240	770	-	-	-
500	35	85	23	55	75	125	62	75	260	-	-	-
600	10	45	6	25	17	45	8	20	60	-	-	-
650	7	33	3	19	7	23	3	3	-	-	-	-

PHYSICAL PROPERTIES AT ROOM TEMPERATURE OR AS INDICATED

Density	g/cm ³	8.9	8.8	8.5
Specific heat	J/Kg K	456	430	420
Thermal conductivity	W/m K	79	26	17.4
Electrical resistivity	μΩ	8.5	51.3	61
Thermal expansion	10 ⁻⁶ /K	14.3	15.8	14.9
20-300°C				
Modulus of elasticity	kN/mm ²	207	182	179

FABRICATION CHARACTERISTICS

Formability	Excellent	Excellent	Good
Weldability	Good	Good	annealed: good age-hardened: not applicable

WELDING PRODUCTS

Filler wire	VDM Nickel S 9604 - FM 61	Nicrocorros S 6530 - FM 60	Nicrocorros S 6530 - FM 60
Covered electrode	2.4156	2.4366	2.4366
	EL-NiTi 3 AWS ENi-1	EL-NiCu30Mn AWS ENiCu-7	EL-NiCu30Mn AWS ENiCu-7

MATERIAL DESCRIPTION, MAIN CHARACTERISTICS

Commercially pure wrought nickel with reduced carbon content (0.02% max). The reduced carbon content avoids graphite precipitation at temperatures above 315°C (600°F). German pressure vessel regulations permit this material to be used at temperatures up to 600°C (1110°F), and up to 450°C (840°F) for caustic soda evaporators.

Nickel-copper alloy. High strength and toughness over a wide temperature range. Excellent resistance to flowing seawater. Good resistance to hydrofluoric acid, non-oxidizing dilute acids, alkalis and salt solutions, organic acids dry gases such as chlorine and to hydrogen chloride. Not susceptible to chloride-induced stress-corrosion cracking. Pressure vessel regulations permit this material to be used at temperatures up to approx. 425°C (800°F).

Nickel-copper alloy, age-hardenable through aluminum and titanium additions. This material combines the excellent corrosion resistance of Nicrocorros - alloy 400 with much higher mechanical properties. Its high tensile strength is maintained at temperatures up to 650°C (1200°F). Nicrocorros Al - alloy K-500 features low permeability and is non-magnetic.