



MATERIAL No.: ALLOY 400/ N04400/ 2.4360

DESCRIPTION

EN symbol (short)	NiCu30Fe	Density kg/dm³	8,8
Alloy	400	Hardness (soft annealed) HB	<=150
UNS	N 04400	Composition	Nickel Copper alloy
AFNOR	Nu 30	Category	Corrosion resisting steels and alloys
BS	Na13	Structure	cubic-face-centered grid
Registered work's label	Monel® 400 Nicros®alloy 400	Corrosion	good resistance to tensile corrosion
		Additional characteristics	good mechanical properties up to 1022°F

Description This chemically stable and high-temperature resistant nickel and copper alloy 2.4360 (alloy 400) is used in the chemical industry.

CHEMICAL COMPOSITION

		C	Mn	S	Si	Al	Fe	Ni	Cu	Ti
2.4360	Min %						1,00	63,00	28,00	
	Max %	0,15	2,00	0,020	0,50	0,50	2,50		34,00	0,30

(Key to Steel 2010)

alloy 400 N 04400	Min %							63,00	28,00	
	Max %	0,30	2,00	0,024	0,50		2,50		34,00	

ASTM B 725

PHYSICAL PROPERTIES

Property		Value				
Density: kg/dm³		8,8				
Hardness: (soft annealed) HB		<=150				
Temperature T	Specific heat	Thermal conductivity	Electric resistance	Modulus of elasticity	Expansion rate from 70°F bis T	

°C/F (°C/F)	J / kgK (Btu / lb °F)	W/mK (Btu·in / ft ² ·h·°F)	μΩ · cm (Ω circ mill / ft)	kN/mm ² (10 ³ ksi)	10 ⁻⁶ / K (10 ⁻⁶ / °F)
-130		22			11,5
20/68 (93/200)	430/(0,102) --- /(0,105)	26/(150) ---/(170)	51,3/(310) ---- /(330)	182/(26,4) --- /(26,1)	--- /(7,7)
200/392 (204/400)	465 --- /(0,110)	33 --- /(190)	55,5 --- /(335)	177 --- /(25,7)	15,5 --- /(8,6)
400/(752) (427/800)	490	40 --- /(240)	58,5 --- /(360)	16 --- /(23,5)	16,9 --- /(8,9)
600/1112 (649/1200)		48,5 --- /(290)	61,8 --- /(380)		16,6 --- /(9,3)
800/1600 (871/1600)		56 --- /(340)	65,5 --- /(400)		17,4 --- /(9,8)
900/1800		58	67,5		17,5

MECHANICAL PROPERTIES (20°C / 68°F)

Mechanical properties (minimal values)	annealed ASTM	Stress-relief annealing ASTM	hard ASTM
Yield strength Rp 0,2 -N/mm²	195	275-415	620
Yield strength Rp 1,0	220		
Elongation %	35	20	5
Notched impact strength ISO-V (Average value at room temperature)	> 150 J/cm ²		> 100 J/cm ²
Tensile strength Rm N/mm²	480	550-600	690-760
Hardness HB	<=150	about 170	about 210
Remarks		Consider delivery condition and thickness	Consider delivery condition and thickness

TEMPERATURE INFORMATION

Application area	
Operation temperature	14 °F to 1022 °F
Explanation report	pressured containers from 14°F to 950°F to 1000°F according to ASME Boiler -und Pressure Vessels Code
Solution heat treatment	
Working temperature	1292 °F to 1652 °F
Explanation report	air cooling

Soft annealing	
Working temperature	1292 °F to 1652 °F
Explanation report	preferably 1500°F
Processing information	air cooling
Solution heat treatment	
Working temperature	2192 °F to 1472 °F
Explanation report	1670°F only slight modulations -slight hot bending from 2192°F to 1900°F
Processing information	air cooling

STANDARDS / INFORMATION

Standards	Description
ASTM B 163	Standard Specifications for seamless nickel and nickel alloy condensers and heat-exchanger tubes
ASTM B 164	Standard Specification for Nickel-Copper Alloy Rods, Bars, and Wires
ASTM B 564-06	Standard Specification for Nickel Alloy Forging
ASTM B 725	Standard Specification for Welded Nickel and Nickel Copper Alloy Pipe
DIN 17443 (09/2002)	nickel- forgeable alloy with copper
DIN 17750 (2002/09)	ribbons and sheet metal out of nickel with nickel-wrought alloy properties
DIN 17751 (2002/09)	tubes out of nickel with nickel-wrought alloy properties
DIN 17752 (2002/09)	rod made from nickel with nickel-wrought alloy properties

PROCESS INFORMATION

Cold forming	mind cold-work hardening , intermittent annealing required for great modifications
Chip removing process	process in annealed state, slow cutting rate, low-strain annealed result in better processing conditions
Welding	
- Material classification acc. CEN ISO/TR 15608	42
- Type	well weldable WIG plasma welding manual arc welding MIG/MAG

- Add. material	covered rod electrode: 2.4366, joint / overlay welding: 2.4377
- Hints	No translation!

MAIN FIELDS OF APPLICATION

Details of application	chemically stable and high-temperature resistant nickel and copper alloy Material can be used in contact with fluorine, hydrofluoric acid and hydrogen fluoride and their compounds good mechanical and corrosion properties
Certifications	pressured container from 14°F to 797°F, NACE MR 01-75
Power engineering	tubes for steam generators
offshore plants	Sea water desalination plant
offshore plants	splash water protection
petrochemical industry	atmospheric distillation of petroleum

RANGE OF PRODUCTS

Product type	Product
Plates / Sheets	plates/sheets plate/sheet cuts
Rotating components	fittings from bar
Fittings	welded elbows welded reductions Welded T-pieces seamless elbows seamless reductions seamless T-pieces
Flanges / Collars / Flared tube ends	flared tube end collars various flanges (weld neck flange, blind flange etc.) weld neck flange/blind flange
Pipes / Tubes	welded pipes/tubes welded square pipes/tubes seamless pipes/tubes
Bar steel	flat steel section steel round bar steel hexagon steel

[Pipe/Tube/Fitting/Flange/Valve/Plate](#)

Stainless Steel/Nickel Alloy/Duplex

