



Alloy 800H / 1.4876

Alloy 800H is an austenitic, heat resistant nickel-iron-chromium solid solution alloy with controlled levels of carbon, aluminum, titanium, silicon and manganese and controlled content of (Al + Ti).

Material Data Sheet

Werkstoffnummer	1.4876 / 1.4958
Alloy	Alloy 800h
EN material name	X10NiCrAlTi32-20
UNS	N 08810
ASTM	ASME ASTM B409
	ASME SB409
	ASTM A240
	ASME SA240
ISO	FeNi32Cr21AlTi-HC
VdTUV Data Sheet	412, 434

Main fields of application of alloy 800H

Heat exchanger pipes at high temperatures quench systems High temperature areas in power plants Refineries (E.g. flares) Laboratory Equipment Furnace construction

Chemical composition of alloy 800H

C	Si	Mn	P	S	Cr
≤ %	≤ %	≤ %	≤ %	≤ %	%
0.01	0,1	0,50	0,025	0,015	22,0-24,0

Ni	Al	Cu	Al+Ti	Fe
%	%	≤ %	≤ %	≤ %
30.0-32.0	0.2-0.4	0,50	max 0.7	rest

Comparison of the different Alloy 800 grades

Alloy 800	800L	800	800H	800ht/hp
Werkstoffnummer	1.4558	1.4876	1.4876/ 1.4958	1.4959
UNS Number	N08880	N08880	N08810	N08811
Operating Temperature [C°]:	<550	<600	600-950	700-1000
Advantages	Corrosion resisting	Corrosion and heat resisting	Heat resisting, resistant to oxidation, carburization, nitration	Heat resisting, resistant to oxidation, carburization, nitration
Heat treatment	Soft annealed (920-980°C)	Soft annealed (920-980°C)	Solution annealed (1150°C)	Solution annealed(1150-1200°C)
Al+Ti content [%]	<=1,0	<=1,0	<=0,7	0,85-1,2
C content	<0,025	0,04-0,08	0,06-0,08	0,06-0,10
Ductility	very good	good	good	less good
VdTUV		412	412/434	412
DIN			17459/17460	
SEW	310/ 400	310/ 470	310	310
Comment		Recommended for temperatures below 600°C	Stocked at Hempel, also useable for <700°C	Below 700 °C (1290 °F), gamma prime (γ') precipitates combined with loss of ductility.

Characteristics

- Good creep resistance at temperatures above 600 ° C.
To avoid a weakening in strength between 500 and 700 ° C the content of Al + Ti is limited to max.0.7%
- Good resistance to oxidizing, reducing and nitriding atmospheres and at varying oxidizing and carburizing conditions
- Metallurgical stability in long-term use at high temperatures

Caution: If temperature 500-700 ° C is passed often during the process, 800h should be preferred. Alloy 800HT may show detrimental phases.

Hot forming

The material is hot formed within a temperature range of 900 and 1200 ° C and afterwards quenched rapidly in water or air. Hot bending is carried out at 1000 to 1150 ° C.

The annealing takes place at 1200 ° C.

Holding time about 60 min. / 100 mm thickness.

After hot forming, heat treatment for optimum creep strength is recommended.

Cold forming

The material has a higher work-hardening rate than austenitic stainless steels. The workpiece should be available in the annealed condition. For strong cold forming intermediate annealing is necessary.

For more than 10% deformation, annealing should be performed.

Heat treatment

The solution annealing is carried out at 1150 ° C. It should be cooled quickly under water.

With thicknesses less than about 1.5 mm rapid air cooling can be done.

Mechanical properties of 1.4876 / 1.4958

The following properties at room and elevated temperatures are in annealed condition and in accordance with the VdTÜV-Blatt. Varying values may be found in literature (e.g. VdTÜV sheet).

At RT

Yield: 170N/mm²

Tensile: 450-700N/mm²

Creep rupture strength of 100.000h value (included VdTÜV safety value 1,5)

		800h				800ht/hp			
According to		VdTÜV 412	VdTÜV 412	VdTÜV 434	VdTüv 434	ASME UNS N08810	ASME UNS N08810	ASME UNS N08811	ASME UNS N08811
(Al+ti)%		<=0,7 or 1,0	<=0,7 or 1,0	<=0,7	<=0,7	<=1,0	<=1,0	<=1,2	<=1,2
t°C	T°F	N/mm ²	ksi	N/mm ²	ksi	N/mm ²	ksi	N/mm ²	ksi
593	1100		11,5		11,5	80	11.5	89	13
600	1112	76	11	76	11	76		84	
648	1200		7		7,5		7.5		8.5
650	1202	49	7	51	7.5	50		56	
700	1292	31	4.5	35	5	33		38	
704	1300		4.5		5	32	5	37	5.5
750	1382	20	3	24	3.5	22		24	
760	1400		2.5		3		3		3.5
800	1472	13	1.8	16	2.2	15		17	
815	1500		1.5		2	13	1.9	15.2	2.2
850	1562	7	1	10	1.6	10		11.7	
871	1600		0.7		1.3	8	1.2	10	1.5
898	1650		0.4		1	7	1	7.5	1.1
900	1652	2,7	0.4	7	1	7		7.5	
926	1700				0.8	5	0.7		
950	1742			5	0.7	4.5			
953	1750				0,6	4.5	0.6		
981	1800				0,5	3.5	0.5		
1000	1832								

For exact values, we recommend the VdTÜV Blatt

Filler metal (for welding with alloy 800H)

The following fillers are recommended:

FM 82

Werkstoff-Nr. 2.4806

SG/UP-NiCr20Nb

AWS A5.14 ERNiCr-3

Covered electrode

Werkstoff-Nr. 2.4648

EL-NiCr19Nb

AWS A5.11 ENiCrFe-3 mod.

Delivery program

Plates in Oberhausen

Standard format: Super-format 2000X6000mm (We can also cut)

Thickness: 2,0/3,0/4,0/5,0/6,0/8,0/10/12/15/20/25/30/38,1mm

Standards: VdTÜV 412 und 434/ ASTM & ASME/ EN 10204 3.1 (3.2 on request)

Services Available :

Water jet cutting / plasma cutting / shear cutting

Bars in Oberhausen:

Ranges Ø12-120mm

Other sizes can be produced within a short delivery time.

Rings and forgings can be manufactured also within a short delivery time.

Services: Sawing / forging (external)

Strip in Oberhausen

2mm Strip

Services: Slitting (external) / producing welded tube (external)

Fittings:

Fittings/ Flanges and other parts are available within short delivery times (1-6 Weeks)

Our special services:

Tailor made packages, material consulting, plates, bars, strip and pre-material for forging in stock

Material with similar field of application

Alloy 602ca / 2.4633

Alloy 600/ 2.4816

Alloy 601/ 2.4851

Further literature

NiDi- Corrosion and Heat-resisting Nickel Alloys by G. Sorell

NiDi- Practical Guidelines for the Fabrication of High Performance Austenitic Stainless Steels (16001)

Book: Nickel alloys and high-alloy special stainless steels:

Properties - Manufacturing - Application , Ulrich Heubner, Jutta Klöwer , Expert Verlag

Material Outlet by Hempel

ECONOXX.com offers buyers a new and uncomplicated procurement channel, which also includes small quantities and materials in special alloys at favourable conditions.

Gehe zu

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Services



Waterjet cutting



Laser cutting



Plasma cutting



Shear cutting

Weight Calculator