

ASTM B625 / ASME SB625

SPECIFICATION FOR UNS N08904, UNS N08925, UNS N08031, UNS N08932, UNS N08926, AND UNS R20033 PLATE, SHEET, AND STRIP

This specification covers alloys UNS N08904, UNS N08925, UNS N08031, UNS N08932, UNS N08926, and UNS R20033 plate, sheet, and strip in the annealed temper.

A. Terminology :-

1. Plate — material 3/16 in. (4.76 mm) and over in thickness and over 10 in. (254 mm) in width.
2. Sheet — material under 3/16 in. (4.76 mm) in thickness and 24 in. (609.6 mm) and over in width. Material under 3/16 in. (4.75 mm) in thickness and in all widths with No. 4 finish.
3. Strip — material under 3/16 in. (4.76 mm) in thickness and under 24 in. (609.6 mm) in width.

B. Chemical Composition :-

1. The material shall conform to the composition limits specified in Table 1.
2. If a product analysis is subsequently made, the material shall conform to the composition limits with the product analysis variation specified in Table 2.

Table 1

Elements	UNS N08904	UNS N08925	UNS N08932	UNS N08031	UNS N08926	UNS R20033
Carbon, max	0.02	0.02	0.02	0.015	0.02	0.015
Manganese, max	2.0	1.0	2.0	2.0	2.0	2.0
Phosphorus, max	0.045	0.045	0.025	0.02	0.03	0.02
Sulfur, max	0.035	0.03	0.01	0.01	0.01	0.01
Silicon, max	1.0	0.5	0.4	0.3	0.5	0.5
Nickel	23.00–28.00	24.00–26.00	24.0–26.0	30.0–32.0	24.00–26.00	30.0–33.0
Chromium	19.00–23.00	19.00–21.00	24.0–26.0	26.0–28.0	19.00–21.00	31.0–35.0
Molybdenum	4.0–5.0	6.0–7.0	4.5–6.5	6.0–7.0	6.0–7.0	0.50–2.0
Copper	1.0–2.0	0.8–1.5	1.0–2.0	1.0–1.4	0.5–1.5	0.30–1.20
Nitrogen	...	0.10–0.20	0.15–0.25	0.15–0.25	0.15–0.25	0.35–0.60
Iron	balance	balance	balance	balance	balance	balance

Table 2

Elements	Tolerances over the max limit or under the min limit, %				
	UNS N08932, UNS N08904, UNS N08925	UNS N08031	UNS N08926	UNS R20033	
Carbon	0.005	0.005	0.005	0.005	
Manganese	0.04	0.04	0.04	0.04	
Phosphorus	0.005	0.005	0.005	0.005	
Sulfur	0.005	0.003	0.003	0.003	
Silicon	0.05	0.03	0.03	0.05	
Chromium	0.2	0.3	0.25	0.3	
Nickel	0.2	0.3	0.25	0.3	
Molybdenum	0.1	0.15	0.15	0.05	
Copper	0.1	0.04	0.04	0.1	
Nitrogen	...	0.01	0.01	0.03	

C. Mechanical Properties and other Requirements :-

1. Tensile and Hardness Requirements— The material shall conform to the mechanical property requirements specified in Table 3.

Table 3

Alloy	Form	Tensile Strength, min, ksi (MPa)	Yield Strength (0.2% offset) , min, psi (MPa)	Elongation in 2 in. or 50.8 mm, or 4D, min, %	Rockwell Hardness (or equivalent) ^A
UNS N08904	sheet	71 (490)	31000 (215)	35	70–90 HRB
	strip	71 (490)	31000 (215)	35	70–90 HRB
	plate	71 (490)	31000 (215)	35	70–90 HRB
UNS N08925	sheet	87 (600)	43000 (295)	40	...
	strip	87 (600)	43000 (295)	40	...
	plate	87 (600)	43000 (295)	40	...
UNS N08932	plate	87 (600)	44000 (305)	40	...
UNS N08031	sheet	94 (650)	40000 (276)	40	...
	strip	94 (650)	40000 (276)	40	...
	plate	94 (650)	40000 (276)	40	...
UNS N08926	sheet	94 (650)	43000 (295)	35	...
	strip	94 (650)	43000 (295)	35	...
	plate	94 (650)	43000 (295)	35	...
UNS R20033	sheet	109 (750)	55000 (380)	40	...
	strip	109 (750)	55000 (380)	40	...
	plate	109 (750)	55000 (380)	40	...

^A Hardness values are shown for information only and shall not constitute a basis for acceptance or rejection as long as the other mechanical properties are met.

D. Test Methods :-

The chemical composition and mechanical properties of the material as enumerated in this specification shall, in case of disagreement, be determined in accordance with the following methods:

Test	ASTM Designation
Chemical Analysis	E 38, E 353 ^{A, B}
Tension	E 8
Brinell Hardness	E 10
Rockwell Hardness	B 18
Hardness Conversion	E 140
Rounding Procedure	E 29
Method of Sampling	E 55

^A Iron shall be determined arithmetically by difference.

^B Methods E 38 are to be used only for elements not covered by Test Methods E 353.

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