

Pure Tungsten WS-3 Sheet 4202

Description of Product This specification covers rolled tungsten sheet produced from pressed and sintered powder metallurgy sheet bar.

Chemical Characteristics¹⁾ (Mass fraction in % [cg/g]; ppm [μ g/g])

The chemical composition of the tungsten powder used in producing sheet bar shall conform to the following limits:

W (By Difference)	min.	99.95	%
Al	max.	0.002	%
Cr	max.	0.002	%
Cu	max.	0.002	%
Mg	max.	0.002	%
Mn	max.	0.002	%
Pb	max.	0.002	%
Si	max.	0.002	%
Sn	max.	0.002	%
Ti	max.	0.002	%
Ca	max.	0.003	%
Fe	max.	0.003	%
Ni	max.	0.003	%
C	max.	0.005	%

Structure All sheet .030 thickness and above will be supplied in a stress-relieved condition. Sheets less than .030 will be supplied in the as rolled condition unless otherwise requested.



WS-3

1) Information on testing methods on request.

Physical Characteristics

Thickness Tolerance:

THICKNESS (INCHES)	UP TO 12 INCHES WIDE (INCHES)	OVER 12 THROUGH 24 INCHES WIDE (INCHES)
0.005 to 0.008	± 0.0007	
Over 0.008 to 0.011	± 0.001	
Over 0.011 to 0.015	± 0.0012	
Over 0.015 to 0.020	± 0.0015	
Over 0.020 to 0.040	± 0.002	
Over 0.040 to 0.187	± 5 %	± 5 %

Width Tolerance:

THICKNESS* (INCHES)	SLIT (INCHES)				SHEARED (INCHES)
	.250 THRU .500	OVER .500 THRU 6	OVER 6 THRU 12	OVER 12 THRU 24	.500 THRU 12
0.005 to 0.009	± .010	± .010	± .015	----	± .031
0.010 to 0.015	± .010	± .010	± .015	----	± .031
0.016 to 0.020		± .015	± .031	----	----
0.021 to 0.039		± .031	± .031	----	----
0.040 to 0.060		± .031	± .062	± .062	----
0.061 to 0.187					± .125

*For thickness 0.040 to 0.187 inches; sheet will be sheared, abrasive cut, band saw cut, or water jet cut to the tolerances shown.

Bedsheet is sold as a useable width, therefore any cracks or delaminations on the edges are acceptable as long as a 6, 12 or 24 inch minimum width can be yielded from the material.

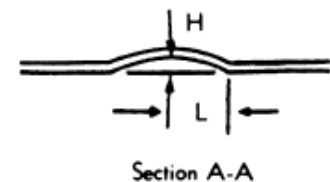
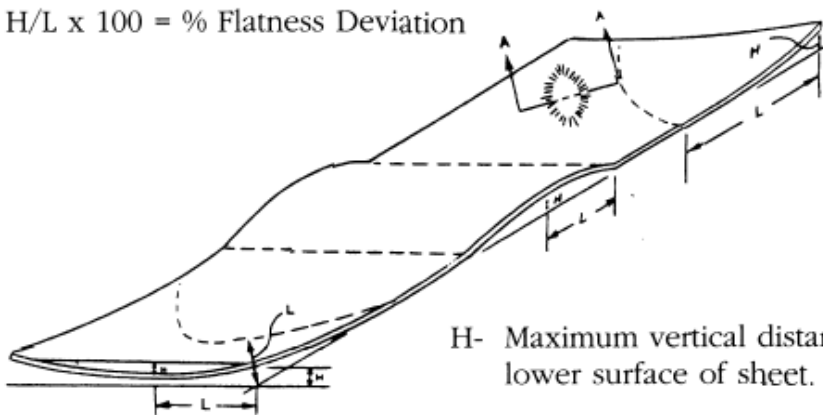
Length Tolerance

For specified lengths, the tolerance for all sizes is + .0625 - 0 inch per foot of length. Edge Straightness-Maximum camber is .0625 inch per foot of length.

Flatness Tolerance

The total deviation from flatness will not exceed 4 % maximum, as determined by the following formula:

$$H/L \times 100 = \% \text{ Flatness Deviation}$$



H- Maximum vertical distance between flat surface and lower surface of sheet.

L- Minimum horizontal distance between highest point on sheet and point contact with flat surface.

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Surface Condition	Sheet is supplied with a bright finish from 0.005 inch through 0.011 thickness and a uniform matte finish will normally be supplied for sheet thicker than 0.011. The sheet will be of uniform quality, clean, and free from foreign matter. It will be free from edge delaminations as determined by visual examination, with the exception of bedsheet width. Normal shear tears are not considered as delaminations.
Hazards identification in Advertising (Directive 67/548/EEC Article 26, Directive 1999/45/EC Article 13 and REGULATION (EC) No 1272/2008 Article 48)	none.
Identification	The material will be identified with appropriate specification number, ingot or lot number, and nominal size. Shipping containers will be marked with the name of the customer and the purchase order number.
Rejection	H.C. Starck must receive written notification of rejected material with the reason for rejection. The right is reserved to inspect rejected material at customer plant for claim validation. The material may be returned only after proper authorization.

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