

## PURE MOLYBDENUM ASL Arc-Cast Sheet 3202 Low Carbon

**Description of Product** This specification covers rolled sheet of carbon-deoxidized molybdenum produced from sheet bar consolidated by the H.C. Starck consumable electrode vacuum-arc-casting process.

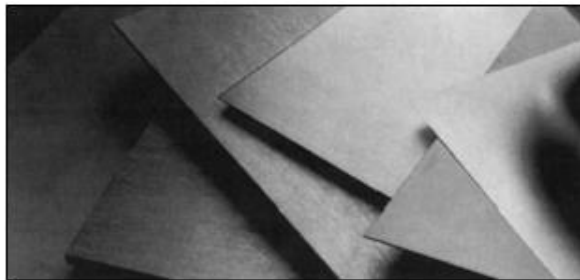
**Chemical Characteristics<sup>1)</sup>**  
(Mass fraction in % [cg/g]; ppm [ $\mu$ g/g])

The chemical composition of the sheet bar used to produce rolled sheet shall conform to the following limits:

Mo(By Difference)	min.	99.97	%
O	max.	0.002	%
Ni	max.	0.002	%
N	max.	0.002	%
C	max.	0.010	%
Fe	max.	0.010	%
Si	max.	0.010	%

**Structure** Sheet will be supplied in a stress-relieved condition unless otherwise requested.

**Mechanical Properties** Tensile tests will be conducted at room temperature (65°F – 85°F) using in a strain rate of 0.002 to 0.005 in/in/min. through 0.6 % offset and 0.02 to 0.05 in/in/min. to fracture. Tensile properties will be determined on specimens taken transverse to the final rolling direction. Test specimens will be prepared and tested according to ASTM Specification No. E-8, utilizing a gage length of 2 inches.



ASL

1) Information on testing methods on request.

Number PD-7028  
Issue 3-10/08/2021

**Physical Characteristics**

Tensile properties shall meet the following minimum values:

Thickness (Inches)	Tensile Strength (psi Minimum)	Yield Strength (0.2 % Offset) (psi Minimum)	Elongation (% Minimum)
0.005 to 0.010	110.000	90.000	5
Over 0.010 to 0.020	110.000	90.000	6
Over 0.020 to 0.060	105.000	85.000	10
Over 0.060 to 0.100	100.000	80.000	14
Over 0.100 to 0.187	100.000	80.000	18

Bend tests will be conducted on specimens, at least 1 inch wide x 2 inches long, taken from the sheet with the major axis transverse to the final rolling direction.

Bend Radius    Bend Severity 90°  
2T                to 0.065 in.

T indicates the sheet thickness. Bend radius is equivalent to one half of the mandrel (or insert) diameter. Testing is performed at room temperature (65°F – 85°F).

**Thickness Tolerance:**

THICKNESS (INCHES)	UP TO 12 INCHES WIDE (INCHES)	OVER 12 THROUGH 24 INCHES WIDE (INCHES)
0.005 to 0.007	± 0.0005	± 0.0006
Over 0.007 to 0.008	± 0.0006	± 0.0007
Over 0.008 to 0.010	± 0.0007	± 0.0008
Over 0.010 to 0.018	± 0.0008	± 0.0009
Over 0.018 to 0.025	± 0.0010	± 0.0015
Over 0.025 to 0.030	± 0.0012	± 0.0015
Over 0.030 to 0.187	± 4 %	± 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	OVER 12 THRU 24
0.005 to 0.009	± 0.005	± 0.005	± 0.010	± 0.031	± 0.031	± 0.062
0.010 to 0.019	± 0.010	± 0.010	± 0.010	± 0.031	± 0.031	± 0.062
0.020 to 0.034		± 0.015	± 0.015	± 0.031	± 0.031	± 0.062
0.035 to 0.059		± 0.031	± 0.031	± 0.031	± 0.062	± 0.062
0.060 to 0.069			± 0.031	± 0.031	± 0.062	± 0.062
0.070 to 0.187					± 0.062	± 0.062

\*For thickness 0.070 to 0.187 inches; sheet will be sheared, abrasive cut, band saw cut, or water jet cut to the tolerances shown.

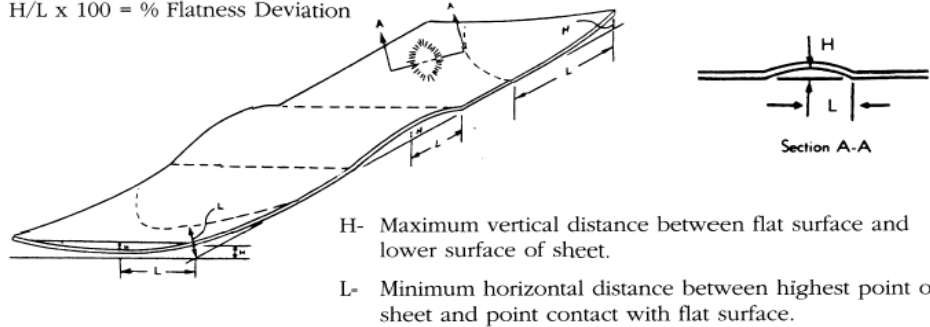
Bedsheet is sold as a useable width, therefore any cracks or delaminations on the edges are acceptable as long as a 6, 12 or 24 inch minimum width can be yielded from the material.

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



the following formula:

**Surface Condition**

Sheet is supplied with a matte or bright finish to 0.060 inch thickness. A matte finish will normally be supplied for sheet 0.060 inch thick and heavier. 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 (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.

H.C. Starck Inc.  
 1801 Tungsten Road  
 Euclid, OH 44117-1117 USA  
 Phone +1 (216) 692 3990

The conditions of your use and application of H.C. Starck products, technical assistance, and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, is your responsibility. Therefore, you are encouraged to test our products and review any technical assistance and/or information you may receive from H.C. Starck with your own resources, and determine to your own satisfaction whether H.C. Starck products are suitable for your intended uses and applications. This application-specific analysis should include at minimum testing to determine suitability for the intended use from a technical as well as health, safety, and environmental standpoint. Any technical assistance and/or information provided by H.C. Starck is given without any express or implied warranty or guarantee. You agree and understand and hereby expressly release H.C. Starck from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance and/or information, except as may be contained otherwise in a written agreement between you and H.C. Starck. Any statement or recommendation not contained herein or in a written agreement between you and H.C. Starck is unauthorized and shall not bind H.C. Starck. Nothing herein shall be construed as a recommendation to use any H.C. Starck products in a manner violative of the intellectual property rights of any third party. No license is implied or granted under or to H.C. Starck intellectual property. All product deliveries are based on the then current product specification and H.C. Starck's Conditions of Sale. IN NO EVENT WILL H.C. STARCK BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.