

## PURE MOLYBDENUM PB Powder Metallurgy Bar

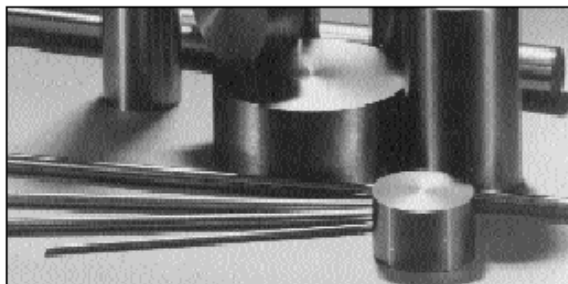
**Description of Product** This specification covers molybdenum wrought bar produced from pressed and sintered powder metallurgy billet.

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

The chemical composition of the molybdenum powder used for producing billets shall conform to the following limits:

Mo(By Difference)	min.	99.95	%
C	max.	0.005	%
Al	max.	0.002	%
Ca	max.	0.003	%
Cr	max.	0.005	%
Cu	max.	0.002	%
Fe	max.	0.005	%
Mg	max.	0.001	%
Mn	max.	0.001	%
Ni	max.	0.002	%
Pb	max.	0.002	%
Si	max.	0.003	%
Sn	max.	0.003	%
Ti	max.	0.002	%

**Structure** Material can be supplied in the recrystallized condition upon request.



**Powder metallurgy Bar**

1) Information on testing methods on request.

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**Mechanical Properties** The hardness will be determined to conform to the following (measured at mid-radius location):

Inches	Diameter		Hardness, DPH (10 kg)	
	Inches	mm	Minimum	
	1/8 to 7/8	3.2 - 22.2	230	
Over	7/8 to 1 1/8	22.2 - 28.6	225	
Over	1 1/8 to 1 7/8	28.6 - 47.6	215	
Over	1 7/8 to 2 3/8	47.6 - 60.3	210	
Over	2 3/8 to 4	60.3 - 101.6	200	

Tensile properties of the bar can be supplied, at additional cost, if requested at time of purchase.

Inches	Diameter		Diameter Variation				Out-of-Round	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
	1/8 to 9/32	3.2 - 7.1	+0.002	-0.002	+ .05	- .05	0.004	0.10
Over	9/32 to 13/32	7.1 - 10.3	+0.003	-0.003	+ .08	- .08	0.006	0.15
Over	13/32 to 5/8	10.3 - 15.9	+0.010	-0.005	+ .25	- .13	0.012	0.30
Over	5/8 to 7/8	15.9 - 22.2	+0.015	-0.005	+ .38	- .13	0.015	0.38
Over	7/8 to 1 22.2	- 25.4	+0.020	-0.005	+ .51	- .13	0.015	0.38
Over	1 to 1 3/8	25.4 - 34.9	+0.020	-0.010	+ .51	- .25	0.018	0.46
Over	1 3/8 to 11/2	34.9 - 38.1	+0.020	-0.015	+ .51	- .38	0.020	0.51
Over	1 1/2 to 15/8	38.1 - 41.3	+0.025	-0.015	+ .64	- .38	0.020	0.51
Over	1 5/8 to 2 41.3	- 50.8	+0.030	-0.020	+ .76	- .51	0.025	0.64
Over	2 to 2 1/2	50.8 - 63.5	+0.032	-0.032	+ .81	- .81	0.025	0.64
Over	2 1/2 to 31/4	63.5 - 82.6	+0.032	-0.032	+ .81	- .81	0.027	0.69
Over	3 1/4 to 31/2	82.6 - 88.9	+0.045	-0.045	+1.14	-1.14	0.040	1.02
Over	3 1/2 to 4 88.9	- 101.6	+0.062	-0.062	+1.57	-1.57	0.050	1.30

Special finished bars can be supplied with a tolerance of  $\pm 0.002$  inch for 2 inches diameter or smaller sizes, and  $\pm 0.003$  inch for larger size bars.

Maximum variation from straightness will be 0.050 inch per foot.

Maximum variation in cut length will be + 1/4 inch, -0.

**Special and Surface/  
Internal Condition**

Bars can be supplied to ASTM 387-90 (additional charge).  
Bars will be supplied with chemically or mechanically cleaned surfaces.  
Minor surface imperfections, revealed by dye penetrant inspection, may be removed by conditioning, provided such removal does not reduce dimensions below specified tolerance limits. Special finished bars will be supplied with a surface finish of 90 RMS or better.  
The internal integrity of bars >1.25 diameter will be determined by ultrasonic inspection and shall satisfy H.C. Starck Ultrasonic Specification No. H.C. Starck-032 (latest version).

**Identification**

Bar will be identified with an appropriate lot number. Each shipping container will be marked with the name of the customer and the purchase order number.

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**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.

**Reports** A product certification report that details pertinent chemical, mechanical, structural and physical integrity features will be provided.

**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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