

## MOLYBDENUM ALLOY PSBT P/M TZM Powder Metallurgy Billet

**Description of Product** This specification covers molybdenum alloy (Molybdenum + 0.5 % Titanium + 0.1 % Zirconium) pressed and sintered billet.

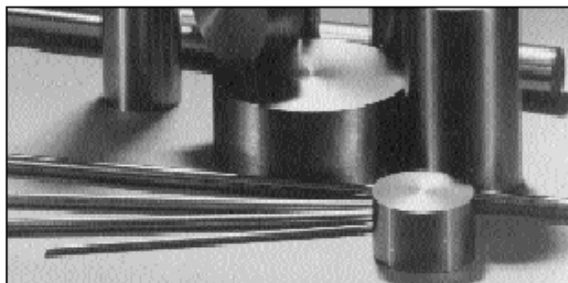
### Chemical Characteristics<sup>1)</sup>

(Mass fraction in % [cg/g]; ppm [ $\mu$ g/g])

Mo(By Difference)	min.	99.2	%
C	0.010	- 0.040	%
*N (witness billet)	max.	0.005	%
*O (witness billet)	max.	0.050	%
Fe	max.	0.010	%
Ni	max.	0.005	%
Si	max.	0.005	%
Ti	0.40	- 0.55	%
Zr	0.06	- 0.12	%

**Physical Properties** Density: The as-sintered density will be 94 % minimum, based on 10.13 g/cm<sup>3</sup>. No defect will exceed a No. 8 FBH as determined by ultrasonic inspection.

\*Per ASTM 387, deviations from these limits shall not be cause for rejection. Analysis shall be conducted on a 2" x 3" witness billet (approximate dimensions) made from the same master lot of powder and sintered with the production billet.



**Powder metallurgy TZM products**

### Dimensional Tolerances

Billet surface will be in the pressed and sintered condition. A machined surface can be supplied at additional cost.

1) Information on testing methods on request.

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Diameter		Tolerance		
Inches	mm	Inches	mm	
Less than 4 inches	< 101.7	± 1/8 inch	± 3.2	
4 to 7"	101.6 - 177.8	± 3/16 inch	± 4.8	
7 to 10"	177.8 - 254.0	± 1/4 inch	± 6.4	
10 to 15"	254 - 381	± 3/8 inch	± 9.6	
15 to 24"	381 - 610	± 3/4 inch	± 19.1	
Greater than 24"	610	± 1 inch	± 25.4	

Length: Maximum variation in cut lengths will be -0 to +1/4 inches, uncut lengths dependant on billet diameter.  
Straightness: Maximum variation from straightness will be 1/32" (.031) in 6 inches.

**Identification** Billet will be identified with an appropriate heat number.

**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** Shipments will be accompanied by documents indicating the specification number, the number of pieces, lot number, billet size and the net weight of each billet size.

**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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