

## H.C. Starck Molybdenum Alloy TZM ABT, Arc-Cast Bar

Category : Metal , Nonferrous Metal , Molybdenum Alloy , Refractory Metal

### Material Notes:

Description of Product: This specification covers carbon-deoxidized TZM alloy (molybdenum + 0.5% titanium + 0.08% zirconium) wrought bar produced from ingots consolidated by the H.C. Starck consumable electrode vacuum-arc-casting process. Structure: Bar will be supplied in a stress-relieved condition, Material can also be supplied in the recrystallized condition. Information provided by H.C. Starck.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_HC-Starck-Molybdenum-Alloy-TZM-ABT-Arc-Cast-Bar.php](http://www.lookpolymers.com/polymer_HC-Starck-Molybdenum-Alloy-TZM-ABT-Arc-Cast-Bar.php)

| Mechanical Properties | Metric                                      | English                                     | Comments                                               |
|-----------------------|---------------------------------------------|---------------------------------------------|--------------------------------------------------------|
| Hardness, Vickers     | <= 215                                      | <= 215                                      | mid-radius, recrystallized bar, all sizes; DPH (10 kg) |
|                       | @Load 10.0 kg                               | @Load 22.0 lb                               |                                                        |
|                       | 235 - 285                                   | 235 - 285                                   | mid-radius; DPH (10 kg)                                |
|                       | @Load 10.0 kg,<br>Diameter 73.03 - 88.9 mm  | @Load 22.0 lb,<br>Diameter 2.875 - 3.50 in  |                                                        |
|                       | 240 - 290                                   | 240 - 290                                   | mid-radius; DPH (10 kg)                                |
|                       | @Load 10.0 kg,<br>Diameter 47.63 - 73.03 mm | @Load 22.0 lb,<br>Diameter 1.875 - 2.875 in |                                                        |
| Tensile Strength      | 245 - 300                                   | 245 - 300                                   | mid-radius; DPH (10 kg)                                |
|                       | @Load 10.0 kg,<br>Diameter 28.57 - 47.63 mm | @Load 22.0 lb,<br>Diameter 1.125 - 1.875 in |                                                        |
|                       | 250 - 310                                   | 250 - 310                                   | mid-radius; DPH (10 kg)                                |
|                       | @Load 10.0 kg,<br>Diameter 22.2 - 28.57 mm  | @Load 22.0 lb,<br>Diameter 0.875 - 1.125 in |                                                        |
|                       | 260 - 320                                   | 260 - 320                                   | mid-radius; DPH (10 kg)                                |
|                       | @Load 10.0 kg,<br>Diameter 3.17 - 22.2 mm   | @Load 22.0 lb,<br>Diameter 0.125 - 0.875 in |                                                        |
| Tensile Strength      | >= 586 MPa                                  | >= 85000 psi                                | ASTM E-8                                               |
|                       | @Diameter 73.03 - 88.9 mm                   | @Diameter 2.875 - 3.50 in                   |                                                        |
|                       | >= 621 MPa                                  | >= 90000 psi                                | ASTM E-8                                               |
|                       | @Diameter 47.63 - 73.03 mm                  | @Diameter 1.875 - 2.875 in                  |                                                        |
|                       | >= 689 MPa                                  | >= 100000 psi                               | ASTM E-8                                               |

| Mechanical Properties   | Metric<br>@Diameter 28.57 -<br>47.63 mm       | English<br>@Diameter 1.125 -<br>1.875 in      | Comments |
|-------------------------|-----------------------------------------------|-----------------------------------------------|----------|
| Tensile Strength, Yield | >= 758 MPa                                    | >= 110000 psi                                 | ASTM E-8 |
|                         | @Diameter 22.2 - 28.57 mm                     | @Diameter 0.875 - 1.125 in                    |          |
|                         | >= 793 MPa                                    | >= 115000 psi                                 | ASTM E-8 |
|                         | @Diameter 3.17 - 22.2 mm                      | @Diameter 0.125 - 0.875 in                    |          |
|                         | >= 517 MPa                                    | >= 75000 psi                                  | ASTM E-8 |
|                         | @Diameter 73.03 - 88.9 mm,<br>Strain 0.200 %  | @Diameter 2.875 - 3.50 in,<br>Strain 0.200 %  |          |
|                         | >= 552 MPa                                    | >= 80000 psi                                  | ASTM E-8 |
|                         | @Diameter 47.63 - 73.03 mm,<br>Strain 0.200 % | @Diameter 1.875 - 2.875 in,<br>Strain 0.200 % |          |
|                         | >= 586 MPa                                    | >= 85000 psi                                  | ASTM E-8 |
|                         | @Diameter 28.57 - 47.63 mm,<br>Strain 0.200 % | @Diameter 1.125 - 1.875 in,<br>Strain 0.200 % |          |
| Elongation at Break     | >= 655 MPa                                    | >= 95000 psi                                  | ASTM E-8 |
|                         | @Diameter 22.2 - 28.57 mm,<br>Strain 0.200 %  | @Diameter 0.875 - 1.125 in,<br>Strain 0.200 % |          |
|                         | >= 689 MPa                                    | >= 100000 psi                                 | ASTM E-8 |
|                         | @Diameter 3.17 - 22.2 mm,<br>Strain 0.200 %   | @Diameter 0.125 - 0.875 in,<br>Strain 0.200 % |          |
|                         | >= 5.0 %                                      | >= 5.0 %                                      | ASTM E-8 |
|                         | @Diameter 73.03 - 88.9 mm                     | @Diameter 2.875 - 3.50 in                     |          |
|                         | >= 10 %                                       | >= 10 %                                       | ASTM E-8 |
|                         | @Diameter 28.57 - 47.63 mm                    | @Diameter 1.125 - 1.875 in                    |          |
|                         | >= 10 %                                       | >= 10 %                                       | ASTM E-8 |
|                         | @Diameter 47.63 - 73.03 mm                    | @Diameter 1.875 - 2.875 in                    |          |
|                         | >= 15 %                                       | >= 15 %                                       | ASTM E-8 |
|                         | @Diameter 22.2 - 28.57 mm                     | @Diameter 0.875 - 1.125 in                    |          |

| Mechanical Properties | <sup>&gt;= 18 %</sup><br>Metric | <sup>&gt;= 18 %</sup><br>English | Comments |
|-----------------------|---------------------------------|----------------------------------|----------|
|                       | @Diameter 3.17 - 22.2 mm        | @Diameter 0.125 - 0.875 in       |          |

| Component Elements Properties | Metric          | English         | Comments      |
|-------------------------------|-----------------|-----------------|---------------|
| Carbon, C                     | 0.010 - 0.030 % | 0.010 - 0.030 % |               |
| Iron, Fe                      | <= 0.010 %      | <= 0.010 %      |               |
| Molybdenum, Mo                | >= 99.25 %      | >= 99.25 %      | by difference |
| Nickel, Ni                    | <= 0.0020 %     | <= 0.0020 %     |               |
| Nitrogen, N                   | <= 0.0020 %     | <= 0.0020 %     |               |
| Oxygen, O                     | <= 0.0030 %     | <= 0.0030 %     |               |
| Silicon, Si                   | <= 0.010 %      | <= 0.010 %      |               |
| Titanium, Ti                  | 0.40 - 0.55 %   | 0.40 - 0.55 %   |               |
| Zirconium, Zr                 | 0.060 - 0.12 %  | 0.060 - 0.12 %  |               |

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