

# HAO Tungsten Alloys Technical Information

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**Table 1 – Typical Properties and Standards of Wolfram Grades**

Grade	JZ 190	JZ 1925	JZ 195	JZ 390	JZ 3925	JZ 395	JZ 397
Aerospace Industry Standards							
ASTM B777-15	Non-magnetic Class 1	Non-magnetic Class 2	Non-magnetic Class 3	Magnetic Class 1	Magnetic Class 2	Magnetic Class 3	Magnetic Class 4
AMS7725E	Type 1 Class 1	Type 1 Class 2	Type 1 Class 3	Type 2 Class 1	Type 2 Class 2	Type 2 Class 3	Type 2 Class 4
<b>Typical Properties*</b>							
Nominal % Tungsten	90	92.5	95	90	92.5	95	97
Binder	Ni/Cu	Ni/Cu	Ni/Cu	Ni/Fe	Ni/Fe	Ni/Fe	Ni/Fe
Nominal Density g/cm <sup>3</sup> lb/in <sup>3</sup>	17.1 0.62	17.5 0.63	17.9 0.65	17.1 0.62	17.5 0.63	18.1 0.65	18.5 0.67
0.2% Proof Stress MPa ksi	675 100	650 95	680 100	645 95	645 95	660 95	660 95
Tensile Strength MPa ksi	805 116	830 120	805 116	875 126	900 130	910 131	915 132
% Elongation on 25mm (1")	7	9	4	25	27	22	12
Hardness, HRC	24	24	24	27	24	24	25

\*Properties may vary according to size and shape of part and production conditions. Figures shown are rounded and are typical for coupons (to fig.19 of ASTM E8) measured in accordance with ASTM B777-15; they are offered without warranty or guarantee. Values may be altered without notice and do not constitute a specification and should not be used for design purposes without reference to HAO CARBIDE CO.,LTD It is for the customer to satisfy itself of the suitability of the products for its own particular purposes and environmental conditions.

## Applications

HAO tungsten alloys can be used in a variety of applications including radiation shielding, balancing, ballast and anti-vibration devices.

For more specific advice about which HAO grades are most suitable for your application please contact us.

**Table 2 - HAO Tungsten Alloy Compared to Other Materials**

	Typical Density g/cm <sup>3</sup>	Typical Density lbs/in <sup>3</sup>
Aluminium	2.7	0.10
Steel	7.8	0.28
Brass	8.4	0.30
Lead	11.3	0.41
HAO HE 395*	18.1	0.65
Depleted Uranium	19.0	0.69

\* See footnote above