ELMET TECHNOLOGIES
Your Edge in Performance Metals

TEL: 207-333-6100 / 1-800-343-8008
1560 LISBON STREET, LEWISTON, ME 04240

ACCREDITED TO AS 9100, ISO 9001
CAGE 7AWJ9

Tungsten Heavy Alloy ("WHA") PRODUCTS

Elmet Technologies presses and sinters high quality tungsten heavy alloy (WHA) blocks, rods, and shaped parts. All material is made in the USA at Elmet's fully integrated facility in Lewiston, Maine. Elmet has a large and growing inventory of standard molds and sizes that can be sold "rough as sintered" or machined to provide tighter tolerances. Sintered WHA blanks can be further rolled or swaged by Elmet to produce plates, sheets, and rods. Elmet also precision machines WHA parts for use as ballast weights, radiation shields, boring bars, ordnance components, and other components that require high density and good ductility.

CHEMICAL COMPOSITION AND AS-SINTERED MECHANICAL PROPERTIES

STANDARD GRADES

Grade	ET90	ET90NM	ET92.5	ET92.5NM	ET93	ET95	ET95NM	ET97
ASTM B-777	Class 1	Class 1	Class 2	Class 2	-	Class 3	Class 3	Class 4
AMS 7725E	Class 1 Type 2	Class 1 Type 1	Class 2 Type 2	Class 2 Type 1	-	Class 3 Type 2	Class 3 Type 1	Class 4 Type 2
MIL-T-21014D	Class 1	Class 1	Class 2	Class 2	-	Class 3	Class 3	Class 4
W content, wt.%	90	90	92.5	92.5	93	95	95	97
Ni content, wt.%	7.0	8.9	5.3	6.7	5.6	3.5	4.4	2.1
Fe content, wt.%	3.0	1.1	2.2	0.8	1.4	1.5	0.6	0.9
Density, g/cm^3	17.0	17.0	17.5	17.5	17.7	18.0	18.0	18.5
UTS, ksi	≥ 110	≥ 94	≥ 110	≥ 94	≥ 110	≥ 105	≥ 94	≥ 100
UTS, MPa	≥ 758	≥ 648	≥ 758	≥ 648	≥ 758	≥ 724	≥ 648	≥ 689
YS, ksi	≥ 75	≥ 75	≥ 75	≥ 75	≥ 75	≥ 75	≥ 75	≥ 75
YS, MPa	≥ 517	≥ 517	≥ 517	≥ 517	≥ 517	≥ 517	≥ 517	≥ 517
Elongation, %	≥ 5	≥ 2	≥ 5	≥ 2	≥ 5	≥ 3	≥ 1	≥ 2
Hardness, HRC	≤ 32	≤ 32	≤ 33	≤ 33	≤ 33	≤ 34	≤ 34	≤ 35
Mag. perm.	> 1.05	≤ 1.05	> 1.05	≤ 1.05	> 1.05	> 1.05	≤ 1.05	> 1.05

Other alloy compositions and properties may be available as special order

All products comply with: DFARS 252.225-7001 Buy American Act; DFARS 252.225-7009 Specialty Metals; DFARS 252.225-7052 Magnet and Tungsten. All products are compliant with EU RoHS Directive 2015/863 and with Regulation (EC) No. 1907/2006 of The European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Mercury or mercury-containing compounds were not intentionally added or came in direct contact with hardware or supplies furnished under this purchase order. Pursuant to Section 1502 ("the Provision") of the Dodd-Frank Wall Street Reform and Consumer Protection Act ("Act") (Pub. L. 111-203, 124 Stat. 1376, July 21, 2010), also referred to as the "Conflict Minerals Act", Elmet Technologies only purchases "DRC conflict-free" minerals from smelters on the Conflict-Free Smelter Program (CFSP) Compliant Smelter list. Material free from radiation contamination.

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CAPABILITIES FOR CUSTOM SIZED MATERIAL

Blocks, sintered	Other sizes with up to 6” to 7” in Width and Height are available with a special mold fee Lengths up to 20” are possible (larger sizes can be limited by weight) The length dimension of some standard mold sizes (above) can be easily reduced It is possible to cut/slice standard sizes into smaller pieces (added cutting fee)
Rods, sintered	0.500 to 4.0” in diameter is possible, with special mold fee, with lengths up to 24” Larger diameters are available for shorter lengths, contact us to discuss your requirements
Rods, swaged	0.25 to 1.0” in diameter Lengths up to 48” (30” is common for swaged rod)
Plate, hot rolled	0.25 to 1.0” in thickness Widths up to 18” and Lengths up to 45”
Disks, sintered	Elmet has several standard disk sizes available: Disk - 5.1" diameter x 1.65" tall with tolerances of +/-.125” Disk - 3.87" diameter x 1.25" tall with tolerances of +/-.125” 5.25" diameter x 1.65" tall x 0.925" diameter hole with tolerances of +/-.125” 4.1" diameter x 1.31" tall x 1.25"Dia hole with tolerances of +/-.125”

Prices

Elmet Technologies WHA pricing is subject to change based on raw material markets and other factors. Please contact your Elmet sales representative or the factory for confirmation of the latest pricing and lead-times.

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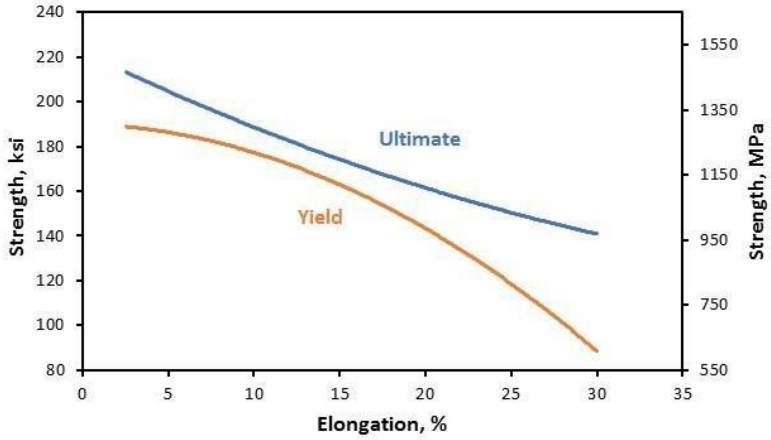
AS-SWAGED WHA ROD MECHANICAL PROPERTIES

Elmet Technologies can adjust swaging and heat-treating conditions to produce WHA rods with specific combinations of strength and ductility.



OPTIONS FOR TYPE OF FINISH

Elmet Technologies offers tungsten heavy alloy in two finish options to meet various customer requirements:

1) Rough as sintered (the way the material come out of our sintering furnaces)
2) Turned, ground or machined to tighter tolerances

Rough As Sintered Finish Tolerances typically in the +.375”/-0” range	
Turned or Ground Finish Tolerances typically in the +/- .030” range