ANVILOY® TUNGSTEN HEAVY ALLOYS *Product card*

ANVILOY® Tungsten Heavy Alloys are a versatile material with a wide range of valuable characteristics. They are often used for many different purposes, such as radiation shielding, high-stiffness uses, and mass property uses.

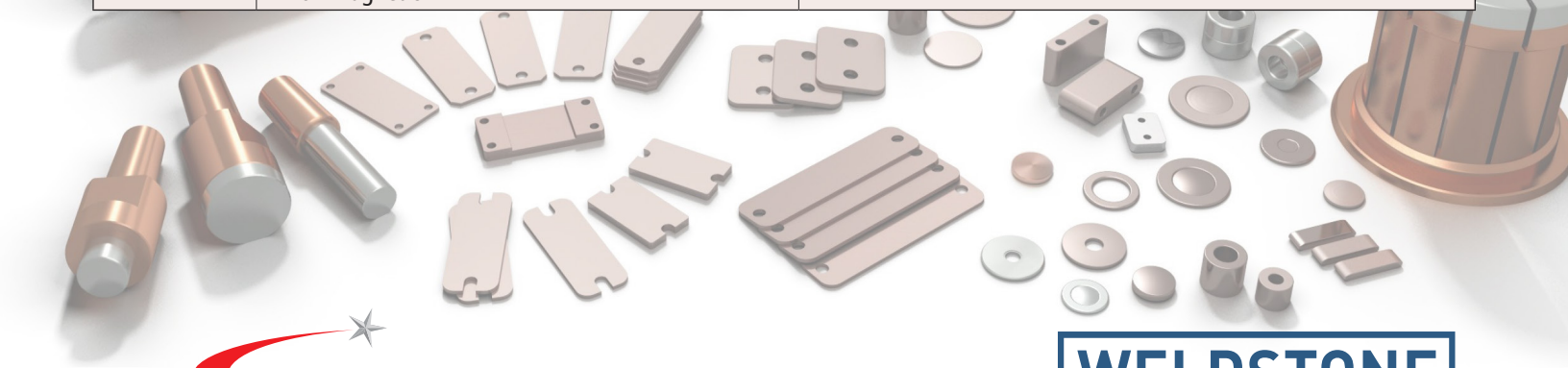
Below is a table that describes alloy characteristics, including minimum values for elongation. It should be noted that mechanical properties of alloys will differ depending on size, and that a number of additional processing options may exist outside of the information below.

Despite tungsten's fragile reputation and narrow capacity for machinability, **ANVILOY®** Tungsten Heavy Alloys are highly ductile when given the correct post-sintering heat treatment. **ANVILOY®** Tungsten Heavy Alloys are perfectly capable of surpassing the ideal minimum values of known standards. They may also be used for cold working processes that require higher strength and hardness levels.

ANVILOY® Grades		170F	175F	180F	185F	170C	175C	180C
Density/Composition Classification	AMS 7725E	CL 1/Type 2	CL 2/Type 2	CL 3/Type 2	CL 4/Type 2	CL 1/Type 1	CL 2/Type 1	CL 3/Type 1
	ASTM B777-15	Class 1	Class 2	Class 3	Class 4	Class 1	Class 2	Class 3
Tensile Properties, Typ. (as-sintered state)	UTS ksi	125	125	125	130	110	110	110
	0.2% OYS ksi	83	85	90	95	80	80	80
	EL, minimal %	5	5	3	2	2	2	1
Magnetic Permeability	ASTM A342	>1.05	>1.05	>1.05	>1.05	<1.01	<1.01	<1.01
Density, Nominal	g/cc	17.0	17.5	18.0	18.5	17.0	17.5	18
	lb/in^3	.614	.632	.650	.669	.614	.632	.650
Hardness, Typical	HRC	28	28	29	30	28	28	29
W Content, Nominal	% by weight	90	92.5	95	97	90	92.5	95
Modulus, Nominal	$X10^6$ psi	50	52	54	56	50	52	54
Binder Elements		Ni & Fe	Ni & Fe	Ni & Fe	Ni & Fe	Ni & Cu	Ni & Cu	Ni & Cu

To achieve the best results, one must carefully pick the right alloy. Start with the information listed below to find the best alloy for the job. Also note that better density, radiation, attenuation, and elastic modulus come at the cost of high ductility and toughness. Always examine mechanical requirements before choosing an alloy, and remember that mechanical requirements are strain-rate sensitive.

Grades	Characteristics	Applications
W90NiFe	• High ductility • High formability	• Stress service • High in-crack resistance • Can be press-formed or rolled into different shapes • Over twice as dense as steel
W92.5NiFe	• Balanced density • Balanced ridigity • Durable	• High stiffness & long extension tooling • Mobile radiation shielding - damage resistant & high radiation attenuation • Defense applications
W95NiFe	• Excellent radiation attenuation • Great for small, precision machined balance weights	• Mobile radiation shielding • Withstands rigorous handling & impact
W97NiFe	• High maximum limit for W in tungsten heavy alloys before ductility becomes limited	• High density applications • Fixed radiation shielding - low stress impact • Strongest radiation shielding potential out of all Dense Alloys
W90NiCu	• Greatest ductility of any low permeability or nonmagnetic grades	• X-ray shielding around electron optics • Uses requiring minimal distortion of local magnetic field geometry • Horizontal oil & gas drilling applications
W92.5NiCu	• Intermediate W content • Good balance between density & mechanical properties in a low permeability grade	• Low magnetic permeability
W95NiCu	• High density • Non-magnetic	• Lower ferromagnetic response than most stainless steels (~1.01)



ASTARAS

WELDSTONE
COMPONENTS GROUP

Americas

Astaras, Inc.
6901 Bryan Dairy Road, Suite 160
Largo, FL 33777
Contact: Jim Brown
jimb@astaras.net
(727) 295-6989

www.anviloy.com

Europe, Asia, Australia

Weldstone GmbH
Kunstmuehlstrasse 12 D-83026
Rosenheim, Germany
Andreas Endemann, Thomas Hoehn
hello@weldstone.com
49 8031-94 13 99-0