

**AN INNOVATIVE TOOL MATERIAL FOR DIE CASTING OR EXTRUDING**

# ANVILOY® 1150



**A MONEY SAVING ALTERNATIVE TO H-13 TOOL STEEL**

Anviloy® 1150 is a tungsten based material developed primarily for die casting and difficult extrusions. To produce Anviloy® 1150, CMW uses special high temperature powder metallurgy processes. A low coefficient of thermal expansion, good thermal conductivity and good material properties at elevated temperatures combine for superior performance in a variety of demanding applications. This unusual combination of properties results in less thermal fatigue and soldering in the die cast or extrusion.

Tungsten, as the base metal, is a special metal mined as wolframite or scheelite, with a high melting point and low coefficient of thermal expansion. CMW adds certain other elements to the tungsten to enhance machinability, ductility and strength, which makes it Anviloy® 1150. Good thermal conductivity provides an additional benefit to increase cooling in difficult to cool areas and can increase production rates. Material properties established during the production of Anviloy® 1150 eliminate the problems often associated with heat treatment of other standard tool materials. ***An innovative material for die casting or extruding that will save you time and money.***

**BENEFITS**

- » Minimizes heat checking *(thermal fatigue)*
- » Reduces soldering *(sticking)*
- » Low erosion rate
- » Provides additional cooling
- » Readily machinable
- » Worn parts are easily re-machined into smaller diameter core pins or larger extrusion dies
- » Requires no pre-machining or post-machining heat treatment
- » Easily welded and repaired with Anviloy® Weld Rod
- » Anviloy® Weld Rod can be very effective to repair and build-up tool steel

**RESULTS**

- » Longer die and core life
- » Less production downtime
- » Better surface finishes on product
- » Fewer rejects
- » Lower cost per piece
- » Less porosity in heavy sections
- » Faster cycle times

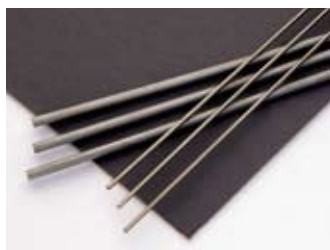
**HIGH DENSITY METALS**

	<b>ANVILOY® 1150</b>	<b>H-13</b>
<b>TYPICAL ROOM TEMPERATURE MECHANICAL PROPERTIES</b>		
Ultimate Tensile Strength, psi (MPa)	140,000 (965)	233,000 (1610)
Yield Strength, 0.2% offset, psi (Mpa)	125,000 (862)	192,000 (1320)
Elongation, % in 2 inches	3.0	13.1
Hardness, HRC	34	45
Modulus of Elasticity, psi x 10 <sup>6</sup> psi (GPa)	49.0 (338)	30.5 (210)
<b>ELEVATED TEMPERATURE TENSILE PROPERTIES</b>		
UTS, psi (MPa) at 1000 °F (537 °C)	113,000 (779)	142,000 (979)
UTS, psi (MPa) at 1200 °F (648 °C)	105,000 (724)	85,000 (586)
UTS, psi (MPa) at 1500 °F (815 °C)	75,000 (517)	20,500 (141)
<b>COEFFICIENT OF THERMAL EXPANSION, IN/IN °F (CM/CM °C)</b>		
68 - 750 °F (20 - 400 °C)	2.52 x 10 <sup>-6</sup> (4.54 x 10 <sup>-6</sup> )	6.8 x 10 <sup>-6</sup> (12.2 x 10 <sup>-6</sup> )
68 - 1450 °F (20 - 790 °C)	2.92 x 10 <sup>-6</sup> (5.26 x 10 <sup>-6</sup> )	7.5 x 10 <sup>-6</sup> (13.5 x 10 <sup>-6</sup> )
<b>THERMAL CONDUCTIVITY, BTU/(H•FT•°F) [W/(M•K)]</b>		
	74.0 (128)	19.8 (34.3)
<b>DENSITY, LB/IN<sup>3</sup> (G/CM<sup>3</sup>)</b>		
	0.623 (17.25)	0.280 (7.76)



Using TIG (GTAW) to repair base material using Anviloy® Weld Rod

Typical casting using Anviloy® material for some die components



**ANVILOY® USES** » Anviloy® 1150 can be used in conjunction with tool steel in the design and use of die casting and extrusion dies allowing for differences in thermal expansion. The thermal conductivity of Anviloy® 1150 increases cooling in critical areas to minimize porosity and other production issues. CMW stocks Anviloy® 1150 round bars in 1/2 inch to 2-1/2 inch diameters by up to 12 inches long. CMW also stocks Anviloy® Weld Rod in .062 inch and .0125 inch diameter by 7 inch minimum long rods. Other sizes and shapes of Anviloy® 1150 are available.

Both Anviloy® 1150 and tool steel accept repairs or build-ups in worn areas using Anviloy® Weld Rod. Anviloy® Weld Rod is applied using TIG (GTAW) welding techniques.

**About the Company** » With its roots to 1916 as the Mallory Metallurgical Company, CMW operates in three primary business units dedicated to silver-based electrical contacts, tungsten-based high density metals and copper-based resistance welding consumables. Numerous organizations have repeatedly recognized our company and its associates for safety, quality and continuous improvement programs. With an employment base including over 1,000 years experience in chemistry, metallurgy, manufacturing engineering and other industrial technologies, CMW operates a range of capabilities across the spectrum of manufacturing in its 6+ acre complex in the center of the United States.

***We stand ready to assist you!***

CMW is ISO 9001:2000 certified.

***For more information about Anviloy® 1150, please call our office or visit our website at [www.cmwinc.com](http://www.cmwinc.com).***

**HIGH DENSITY METALS**