

# GREEN WEAPON FOR BATTLEFIELD



A Revisit on Tungsten Heavy Alloys (WHAs) by Agescan International Inc.

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## WHAs IN DEFENSE AND AEROSPACE



Prefabricated Fragments



WHA Core for AP bullet

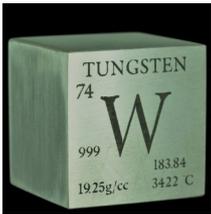


WHA Swaging Rod for Penetrator



WHA Counterbalance Weight for Aerospace

## Why Tungsten Heavy Alloys (WHAs)?



WHAs provide a unique combination of density, mechanical strength, machinability, corrosion resistance, and economy. WHA overcomes the toxicity, deformability, and inferior density of lead and its alloys. Likewise, it can provide equivalent density to depleted uranium (DU) but without the special machining considerations (necessary due to its pyrophoricity) and licensing requirements for a radioactive substance. WHA is truly the material of choice for high density applications. These unique alloys provide the designer with many new freedoms.

## WHAs in Defense Ordnance Application



WHAs have been routinely used in high density fragmenting devices and armor piercing (AP) ammunition ranging from small caliber 5.56 mm rounds up to 120 mm anti-tank projectiles and beyond. Material for kinetic energy penetrators is typically vacuum annealed and resolutionized/quenched for maximum ductility (25-35% EL typical) and toughness prior to being cold worked by swaging. Deformation processing generates a directional microstructure, high yield strength (150-200 ksi), and elevated hardness (40-44 HRC). Even higher mechanical properties are attainable from tungsten-nickel-cobalt compositions. These high property sets provide a useful indication of the wide range of properties in which WHAs can be supplied.

## WHAs in Airplane Counterbalance Application



Counterbalance weights for fixed and rotary wing aircraft have been used for many years. WHA weights, unlike lead which creeps under its own weight at room temperature, can be securely fastened to aerostructures. In contrast to DU weights, WHA weights are free from SCC concerns, special licensing requirements, environmental issues, and the negative public response to having many pounds of radioactive material routinely flying overhead. WHA weights are typically machined from near net shape blanks to precise tolerances and provided with a protective coating to the customer's specification.

## What Agescan Brings to CANSEC 2018?



We bring our world class top quality WHA material to help defense giants develop their cutting edge and environment friendly ordnance and counterbalance weight products which includes:

- ◆ Ball & Cube for Prefabricated Fragments
- ◆ Swaging Rod for APFSDS
- ◆ WHA Core for Small/Medium Caliber
- ◆ Aerospace Counterbalance Weight & Ballast

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