Specialists in Seals & Service
Hi-Tech Seals Inc.

Tungsten Carbide

Technically Speaking

Tungsten carbide material features extreme wear resistance and hardness. The material is typically forged by the reaction of tungsten (W) metal and carbon (C) at 1400 to 2000˚C. The result is a grey powder that can be pressed and formed into virtually any shape. When processing the powder into a shape, manufacturers use either a nickel or cobalt-bonding agent. Several chemical compositions can be used to provide better properties for varying applications. The percentage of chemicals for nickel bonded tungsten carbide can ranges from 94% WC/ 6% NiCR to 90% WC / 10% NiCR.

A 94% WC / 6% NiCR Tungsten Carbide composition is the most popular blend used by Hi-Tech Seals' clientele in the downhole tools industry. The nickel-bonding agent tends to perform better than other blends in a downhole environment. Cobalt blends are also used in various oilfield applications and tend to display better impact resistance over a WCNi blend. Hi-Tech Seals has gained experience while working with our global clientele and can assist you in the selection of the proper Tungsten Carbide material for your specific application.

Properties of the 94% WC / 6% NiCR:

Density : 14.5 -14.9 g/cm3
Hardness : 89.5 HRA
Bending strength : 1550 N/mm2
Coefficient of linear expansion (106/k) : 5.2
Melting point : 2870˚C

To learn more, consult one of our sales representatives.