



## Why Tungsten Carbide as a coating for feedscrews?

Carbide type and volume percentage are critical to the abrasion resistance of any material used for wear resistance. Tungsten Carbide is one of the hardest, most economical, user friendly compounds that form in nature when combined with carbon. Information scanned from Surface Engineering for Wear Resistance by Kenneth G. Budinski, 1988, Prentice-Hall, Inc.

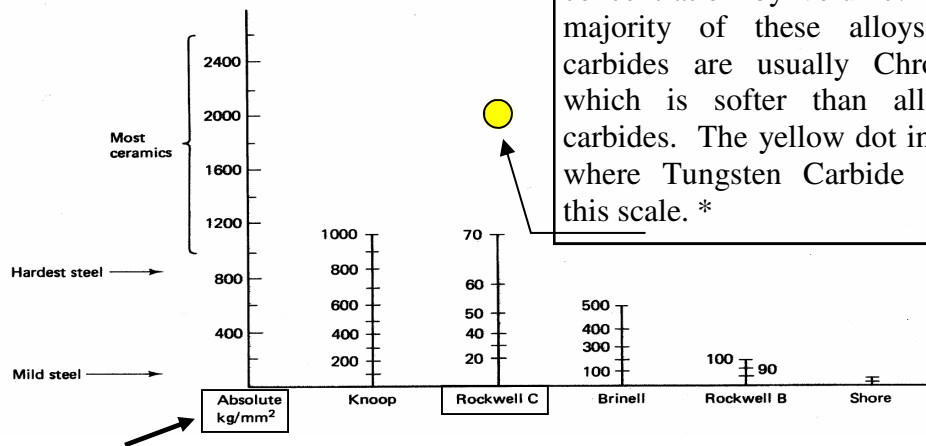
### Cemented Carbides

The welding consumables that are called “composites” by the AWS are based on technology related to cemented carbides. This group of engineering materials fits into the generic category of cermets; a cermet is a material that is part metal and part ceramic. Cemented carbides are ceramic materials, usually carbides, in particle form that are bonded together with a metal, usually cobalt or nickel. The carbides used in cemented carbides are compounds of carbon and tungsten, tantalum, titanium, columbium, and other metals. Their hardness varies, but all are harder than the hardest metal:

Tungsten Carbide (WC) may be the equivalent of +/- 85 RC, very hard. Our XC1000 material contains up to 90% by weight WC - a little more than 80% by volume. The most wear resistant alloys have less than 35% carbide concentration by volume! For the majority of these alloys, their carbides are usually Chromium, which is softer than all listed carbides. The yellow dot indicates where Tungsten Carbide fits on this scale. \*

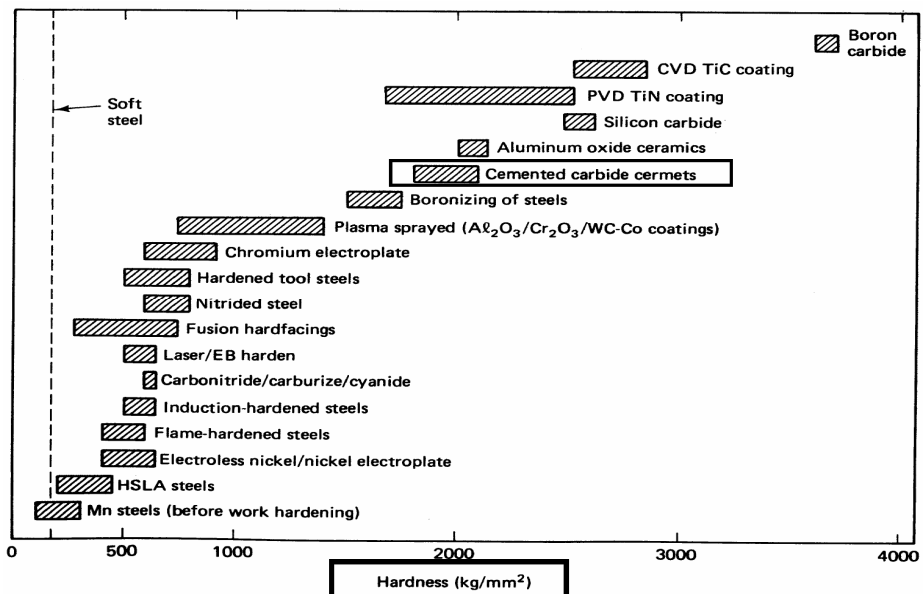
#### ABSOLUTE HARDNESS (kg/mm<sup>2</sup>)

- Hardest steel, 900
- Tantalum carbide, 1750
- Molybdenum carbide, 2000
- Tungsten carbide, 2000**
- Columbium carbide, 2100
- Titanium carbide, 2500
- Vanadium carbide, 2600
- Boron carbide, 2700



## Hardness Comparison of Common Materials

The Hardness Table compares hardness on the Absolute Scale (Kg/mm<sup>2</sup>) for many known materials. Note that our XC coatings fall into the category of “Cemented Carbide Cermets”. These are nearly the hardest materials listed. Of the harder materials listed, **NONE** can be applied thick enough or with a high enough bond strength to offer any substantial value to the life of a feedscrew with respect to the cost of the coating.



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