



CLINCHER Grit Faced Die and Insert Coating

The CLINCHER Grit Faced die and insert coating system combines the use of extremely hard grit particles, high strength corrosion resistant brazing materials and application processes which insure optimum dimensional control.

Tungsten Carbide grit particles are graded by size and shape to provide uniform granules with desired geometry. Different particle sizes are selected based upon application. Coatings on smooth faced dies use larger particles than the coatings applied to dies which have machined teeth. Coating thicknesses for small particles are approximately 0.010". Thicknesses for large particle coatings is approximately 0.025" thick.

Use of grade C-4 tungsten carbide refractory material controls the chemistry of the grit particles to prevent iron contamination. The Tungsten Carbide particles are metallurgically bonded to the die substrate using a high strength Nickel/Chrome brazing compound containing 83% nickel, 6.8% Chromium, 4.2% Silicon and 3% Boron. The remaining 3% balance of materials consists of a variety of trace elements including a small percentage of iron. It is important to note these materials are alloyed together at extremely high temperatures so there is no free iron available to contaminate CRA tubulars.

The Tungsten Carbide grit particles and brazing material are applied in controlled quantities using proprietary dispersion processes which align the particles and insure uniform distribution of materials in a single layer. The quantities of materials used insure the particles are securely fixed to the substrate but left with enough exposed surface to precisely grip oilfield tubulars.

Brazing of the components takes place at 1800 degrees Fahrenheit in a controlled atmosphere furnace where temperatures and times are precisely controlled. Mechanical properties of the die or insert substrate are controlled using a combination of pre and post-brazing heat treatment processes.

**Covered under US Patent No's 6,378,399, 6,755,097 & 7,036,397
Other US and foreign patents pending**