Bodycote

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Process Datasheet

TECH 23

Extended wear life in corrosive environments

TECH 23 is a composite ceramic material thermochemically bonded to customer specified areas on a part, including OD's and ID's and some out-of-sight holes and ports. Individual ceramic particles are sub-micron in size and consist of mixtures of selected ceramic materials bonded together and to the substrate. Porous after the initial formation of the ceramic, **TECH 23** is densified using ceramic precursor chemicals plus corrosion resisting chemicals. When thermochemically converted into ceramic and corrosion protection in situ, the densification processes form additional bonds and mass within the initial ceramic body. Each densification cycle fills some of the remaining porosity until a fully dense, non-porous, corrosion resistant ceramic coating has been created.

BOND STRENGTH

TECH 23 is an almost totally dense (98%) ceramic coating and is unique in that it has no open porosity. **TECH 23** processing completely seals off this open porosity making the part impervious to chemical attack.

HARDNESS

As with **TECH 22**, the **TECH 23** coating particle hardness range measures from 1000 to 2850 Vickers. When measured microscopically, the composite hardness is between 1000 and 1850 Vickers. In sliding wear applications the surface wears as a result of the hardest component, chromium oxide, which has a hardness of 2850 Vickers.

RESULTS

The unique combination of particle hardness, chemical bonding, and lack of porosity result in a coating that is unparalleled in wear resistance in corrosive environments. This has been proven in the field by the coatings' use down-hole, in hot 30% CaCl2 (Calcium Chloride) and in pumps running hot, 90% H2S04 (Sulfuric Acid). Life expectancy of parts used in these applications are now measured in years instead of weeks.

PROPERTIES

- 0.002 - 0.003" Thick
- Hardness range 1000-l850 Vickers
- Chemically bonded
- Extreme wear resistance
- Resistant to thermal cycling/shock
- Ultra fine grain size
- Surface finish adjustable from 5 - 60 Rms.
- Low friction
- Better resistance to corrosives
- Stands up to 30% CaCl2, 90% H2S04
- Non-stick surface

TECHNICAL DATA

Hardness	1000-1850 Vickers
Bond Mechanisim	Chemical
Bond Strength	Over 10,000 PSI
Thickness	0.002- 0.004 Inches, typical
Coefficient of friction	0.22 - 0.28 Against fiber, 0.1 - 0.13 Against metal
Corrosion Resistance	+560 Hours in hot CaCl2 (no damage)

TECH 23 is part of the Bodycote unique range of thermochemically-formed ceramic coatings for the prevention of wear and corrosion in a wide variety of industrial applications and for every type of surface.