

Process Datasheet

TECH 28E

Durable sealing surfaces for corrosive environments needing electrical resistance

TECH 28E is a composite ceramic material which adds a dimension of toughness to the composite coating line. The initial slurry is chemically modified to enhance wear characteristics when in contact with seal material. Subsequent thermochemical processing bonds precursors into the substrate resulting in a very hard, dense, and chemically inert coating.

BOND STRENGTH

TECH 28E develops a bond into the substrate through the formation of a spinel-like interphase between the ceramic coating and the metal surface. Part of the thermochemical reaction causes the substrate metal's surface atoms to migrate into the ceramic coating while some of the ceramic molecules are moving into the substrate during initial processing. Like the **TECH 22** and **TECH 23** coatings, **TECH 28E's** bond strength to the substrate is in excess of 10,000 PSI.

DENSITY

TECH 28 is an almost totally dense (>97%) ceramic coating and, like the **TECH 23** coating, has no open porosity to the substrate. Modification of the inter-granular bonding mechanism substantially increases the density of the initial coating. **TECH 28E** processing completely seals off this open porosity, making the part impervious to most chemical attack.

HARDNESS

The particles in **TECH 28E** coating range in hardness 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, density, chemical bonding, and lack of porosity result in a coating which is durable, chemically resistant and acts as a good electrical insulator. A slight surface profile will allow lubrication of mechanical seals. Field use in gap subs, antennas and insulation rings prove that **TECH 28E** can insulate housings and other components from typical down-hole conditions.

TECH 100

TECH 100 is a polymeric coating that is applied on top of **TECH 28E** to give better resistivity in wet applications. This unique, baked-on coating adds 0.001" to the thickness of **TECH 28E**, but can better insulate substrate metals in wet applications. Resistivity measures "Infinity" up to 250 volts, wet or dry.

TECHNICAL DATA

Hardness	1000-1850 Vickers
Surface Finish	25 to 64 micro inches rms
Bond Strength	In excess of 10,000 psi (69 Mpa)
Thickness	0.002" to 0.0025" (0.020 mm to 0.031 mm)
Corrosion Resistance	+2000 Hours in hot CaCl ₂ (no damage)
Oxidation Resistance	Protects steel from oxidation to 850° C (1560° F)
Electrical	Infinite resistivity up to 250 volts dry
Plus TECH 100	Infinite resistivity up to 250 volts wet or dry