

## Process Datasheet

# TECH 22

For textile, wire drawing, plastic injection molding and sizing, pump, glass, and other industries where sliding and rotational wear are concerns

**TECH 22** 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 22** can be densified using a wide selection of ceramic precursor chemicals. When thermochemically converted into ceramic in-situ, the densification processes form additional bonds within the initial ceramic body. Each densification cycle fills some of the remaining porosity until a dense, non-porous ceramic coating has been created.

### BOND STRENGTH

**TECH 22** coating develops a bond into the substrate through the formation of a spinel-like interface between the ceramic coating and the metal surface. Part of the thermochemical reaction causes the substrate metal atoms to migrate into the ceramic coating during initial processing. The bond strength of the ceramic coating to the substrate is in excess of 10,000 PSI.

### HARDNESS

Individual particles within the **TECH 22** coating range in hardness from 1000 Vickers 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.

### THICKNESS

The best results are achieved when the **TECH 22** coating is 0.002 to 0.004 inches thick. Dimensional tolerances of +/-0.001 are common and tolerances of +/-0.0001 are achievable.

### WEAR RESISTANCE

**TECH 22** is superior in sliding wear resistance. Such diverse industries as oil drilling, textiles, wire drawing, automotive, and glass manufacturing have benefited from the extraordinary increase in life of critical machine components realized by using this coating. Life increases as much as 50 times have reduced maintenance costs and increased production efficiencies by using the **TECH 22** coating.

### PROPERTIES

- 0.002 - 0.004" Thick
- Hardness range 1000-1850 Vickers
- Chemically bonded
- Extreme wear resistance
- Resistant to thermal cycling/shock
- Ultra fine grain size
- Surface finish adjustable from 5 - 60 Rms.
- Applied to ID and OD
- Low friction

### TECHNICAL DATA

Hardness	1000-1850 Vickers
Bond Mechanism	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