

**Molybdenum  
Thermo-Sealed Coating**

Derived from the aerospace industry, this type of Cobalt Chrome Molybdenum base coating has shown good wear resistance and corrosion properties over a wide range of temperatures. This coating is an intermetallic composite material which is ideal for non-lubricated wear applications. The coating consists of a dense layer of Cobalt Chrome Molybdenum sealed by matrix interstitial chrome oxide and a phosphate glass overcoat. **Adiabatics** has combined the technologies of High Velocity Oxygen Fuel (HVOF) sprayed coatings with thermal chemical bonding technology to generate a new hybrid coating which provides an enhanced resistance to high temperature wear and corrosion.

**Nominal Chemical Composition:** Cobalt Chrome Molybdenum (Co=Balance, Mo=28.5, Cr=17.5, Ni=3.0 max., Si=3.4, C=0.08 max.) Chrome Oxide, and Phosphate Glass Phase Sealer.

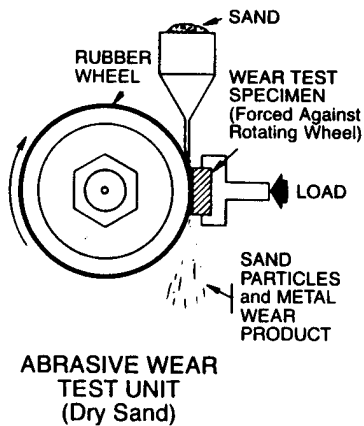
**Thermo-Sealed Co-Cr-Mo Physical Properties**

Density, lb/in <sup>3</sup> , (kg/m <sup>3</sup> )	0.312 (8636)
Melting Range, °F (°C)	2400 (1316)
Mean Coefficient of Thermal Expansion μin/in-°F (x 10 <sup>-6</sup> m/m-°K)	
Room - 1500 (816)	7.3 (13.1)
Thermal Conductivity Btu-in./ft <sup>2</sup> , (W/m-°K)	99 (14.3)
Hardness Rockwell C @ Room Temp.	54-62
Average Modulus of Elasticity psi x 10 <sup>6</sup> , (Mpa) @ Room	35.3 (243,000)
Average Compressive Strength ksi (Mpa) @ Room Temp.	258 (1780)

**Thermo-Sealed Co-Cr-Mo Corrosion Data**

Acetic Acid 50% Boiling	< 2mpy (< 0.05 mm/y)
Ferric Chloride 10% Room Temp.	< 20mpy (< 0.51 mm/y)
Formic Acid 30% 150°F (66°C)	< 2mpy (< 0.05 mm/y)
Hydrochloric Acid 5% 150°F (66°C)	< 2mpy (< 0.05 mm/y)
Nitric Acid 65% 150°F (66°C)	>20mpy (>0.51 mm/y)
Phosphoric Acid 85% 150°F (66°C)	< 2mpy (< 0.05 mm/y)
Sodium Chloride 10% Room Temperature	<20mpy (<0.51 mm/y)
Sulfuric Acid 10% Boiling	>20mpy (>0.51 mm/y)

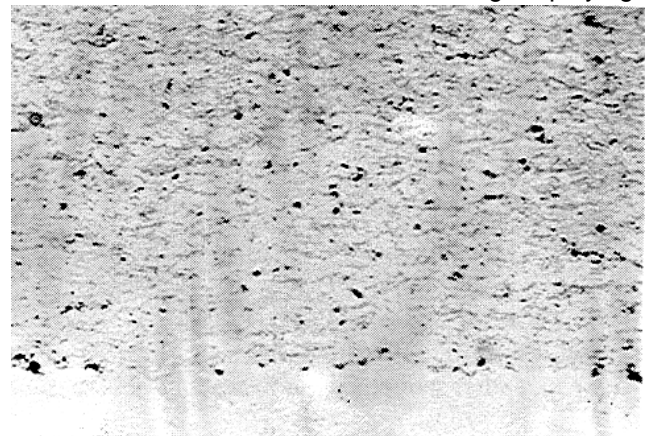
**Comparative Abrasive Wear Test Data**



Test for 2000 revolutions at 30lb. Load (13.6Kg), using a 9 in. (229 mm) dia. Rubber Wheel and Dry Sand

<b>Volume Loss (mm<sup>3</sup>)</b>	65
<b>Wear Coefficient</b>	9 x 10 <sup>-4</sup>

Cross Section of Co-Cr-Mo Wear Coating Displaying



Thermo-Sealed Overlay of Cr<sub>2</sub>O<sub>3</sub> and Phosphate Glass Binder Phases.