SYMCOAT METAL PROCESSING
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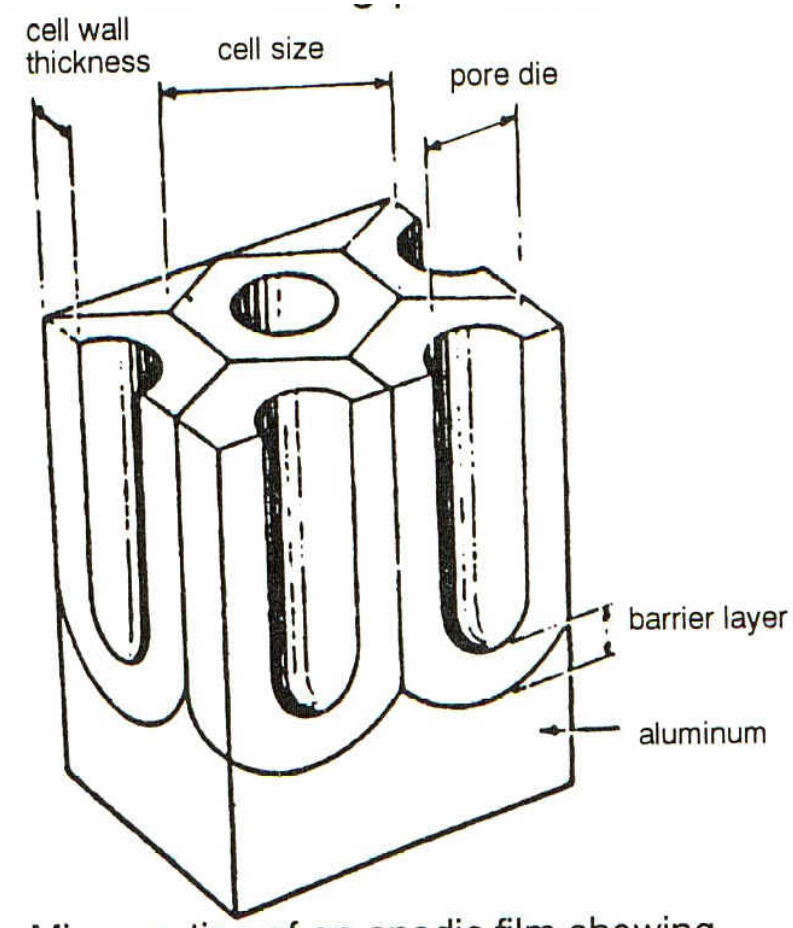
# SYMCOAT HCT Mil-A-63576 A

**SYMCOAT HCT** is a multi-step process that makes aluminum surfaces as hard as steel. This process combines the hardness of aluminum oxide with complementary properties of selected fluorocarbons to provide wear and corrosion resistance, hardness, and permanent lubricity at previously unobtainable levels.

**NO CHIPPING - NO PEELING**
Since this "synergistic" coating becomes an integral part of the parent metal in the multi-step **SYMCOAT** process, it cannot peel or chip. Because the process converts the surface of the aluminum to a ceramic and then interlocks the specific chosen polymer to become harder than case-hardened steel, it then cannot be nicked, scratched, or flaked by ordinary means. This eliminates the concern of contaminating particles.



Microsection of an anodic film showing cellular porosity before sealing

**THERMAL CONDUCTIVITY**
Aluminum that has been coated with ***SYMCOAT HCT*** exhibits rapid heat and cold transfer. The **SYMCOAT** process, by converting the original single flat crystal with millions of surfaces, produces a heat distribution within the encapsulated outer surface far above that of untreated aluminum. Selective **SYMCOAT** Processing permits wide ranges of conductivity for heat sink applications. The polymetric material with which the **SYMCOAT** coating is impregnated has a heat conductivity of 1.7 + .03 Btu/hr/sq ft/deg/F/in. Heat capacity is 0.25 Btu/lb/deg F.

**FRICTION AND SLIDE PROPERTIES**
The polymer impregnation that results from the **SYMCOAT** synergistic coating process provides a smooth, slippery surface with permanent lubricity. Tests indicate that static friction decreases with increase in load. The static coefficient of friction (0.05) is also higher than the dynamic coefficient. This characteristic eliminates the problem of "stick-slip" in which higher break-away friction causes undesirable vibration.

**DIELECTRIC RESISTANCE CHART**

| COATING THICKNESS, IN. | SURFACE GROWTH, IN. | DIELECTRIC RESISTANCE, VAC |
|---|---|---|
| 0.0008 | 0.0004 | 200 |
| 0.0010 | 0.0005 | 500 |
| 0.0020 | 0.0010 | 1000 |
| 0.0030 | 0.0015 | 2000 |

**SYMCOAT HCT OFFERS:**

- **Improved Abrasion Resistance**
- **Perfect Bond to Base Metal**
- **Chemical Resistance**
- **Permanent Lubricity**
- **Corrosion Resistance**
- **Hardness**
- **High Dielectric Strength**
- **Wear Resistant Mold Release**

**COATING THICKNESS**
The coating consists of 50% penetration and 50% buildup. A coating 0.002 in. thick only builds up the surface by 0.001 in. Dimensions should allow for buildup. The standard coating thickness is 0.002 in. unless otherwise specified. Thickness can range from 0.0004 to 0.008 in. to match customer requirements. Thickness can be controlled within +/-10%.

**ALLOYS**
Most aluminum alloys can be coated. Even the most difficult, such as 380 die cast, 2011 and 2019, can be coated. Our programmed, automatically controlled process provides uniformly high quality and reproducibility.

**CLASSES FOR**

**Symcoat HCT, Class 1**

- Abrasion Hardness (Rc60-65)
- Resists Corrosion, Abrasion, and Wear
- Salt spray tested to 5,500 hours without corrosion
- Low Coefficient of Friction, Lubricity
- Comparable to: Tufram L-4, Tufram H-2, Magnaplate HCR, Tiodize X-20

**Symcoat HCT, Class 2**

- Superior Corrosion Protection

- Salt spray tested to 6,500 hours without corrosion
- High dielectric strength
- Improved Lubricity
- Excellent Heat Transfer Properties
- Comparable to: Tufram H-0, Tufram HCD-31, Tufram HT-41

**Symcoat HCT, Class 3, black**

- Best Mold Release
- Low coefficient of friction
- High temperature applications
- Comparable to: Tufram R-66

**CAPACITY**

- Maximum size of tank load is 54" x 40" x 30"

**TYPICAL APPLICATIONS**

- Gears
- Pumps
- Hydraulic Cylinders
- Transmission Thrust Washer
- Differential Cross Shafts on Which Resistance to Galling Type Wear is Obtained