



MAGNAPLATE

COATINGS ENGINEERED FOR YOUR SUCCESS

BENEFITS

- Reduces wear and friction on sliding surface contacts
- Provides enhanced erosion and corrosion resistance
- Excellent abrasion resistance
- No micro cracks to affect performance
- Ensures design reproducibility
- Eliminates galling, seizing and high friction over a broad range of applications
- High temperature resistance
- Allows flexibility of design and metal choice
- Complies with Mil-A-8625, Mil-PRF-8625, AMS 2469, AMS 2482
- Recommended as a finishing process eliminating costly secondary operations such as grinding

Magnaplate HCR[®]

*“Synergistic” Surface Enhancement Technology
Maximizes Corrosion Resistance and Hardness of
Aluminum and Aluminum Alloys*

MAGNAPLATE HCR[®] is a proprietary surface enhancement technology that produces a harder-than-steel surface on aluminum parts. In addition, it exhibits extraordinarily improved corrosion resistance over hard anodizing and withstands salt spray exposure in excess of 15,000 hours. By combining the hardness of aluminum oxide ceramic with the sealing action of metallics and proprietary polymers, it imparts previously unattainable levels of hardness, corrosion resistance and permanent lubricity to aluminum and aluminum alloy parts.

ENGINEERING DATA & PERFORMANCE CHARACTERISTICS

Corrosion resistance. A MAGNAPLATE HCR “synergistic” coating exhibits far superior levels of salt spray resistance on aluminum than either conventional hard anodizing or even any other Magnaplate coating.

FDA compliance. A modified version of this coating, MAGNAPLATE HCR-F, is compliant for use in “food- contact involving repeated use, such as food processing equipment.”

Weather resistance. Tests of parts which were coated with MAGNAPLATE HCR and exposed to the most severe climatic conditions confirm its weather-resistant properties. Resistance to extreme heat and to ultraviolet light is excellent.

Adherence and impact resistance. Because MAGNAPLATE HCR becomes an integral part of the parent metal, it resists peeling, chipping or flaking off, and being nicked. That reduces problems caused by contamination from loose particles. Its impact resistance is limited only by the structural strength of the base metal to which it is applied.

Coating tolerances and thickness. With very few exceptions, a consistently uniform MAGNAPLATE HCR coating, which ranges in thickness from 0.001-0.0025 inch per side, can be applied to pre-balanced impellers. Precise control of finished coating thickness permits use on close-tolerance parts such as threaded members. By undersizing the outside pitch diameter by approximately four times the coating thickness prior to coating, the original thread sizes can be maintained after coating.





Equipment such as a sub-sea sonar collar can be protected against salt water corrosion during oil exploration.



MAGNAPLATE HCR solved problems of wettability and of corrosion from acidic and alkaline reagents on the aluminum carousel and slide platforms on computerized immunostaining equipment.



Aluminum impeller is protected against abrasion, corrosion, friction and drag.



Severe wear caused by abrasive paper products can be eliminated on parts such as guides and fingers of packaging machinery.

While not recommended, slight burnishing, lapping or honing can be performed on a coated part, if necessary. However, removal of the surface material should be no more than 0.0002 inch.

For machining allowances, note that overall final thickness of the coating is influenced by two factors:

- A. Penetration
- B. Surface Growth

The table below shows typical examples:

COATING THICKNESS	SURFACE GROWTH*
0.0008 inch	0.0004 inch
0.0010 inch	0.0005 inch
0.0020 inch	0.0010 inch

*Growth is approximately 50% of the thickness value

Effective temperature range. MAGNAPLATE HCR coated parts exhibit strength and self lubricity down to -110°F (-79°C). Parts can also operate effectively at temperatures as high as +500°F (+260°C) at intermittent operating conditions.

Friction properties. MAGNAPLATE HCR coatings provide smooth, slippery surfaces with permanent lubricity. This characteristic eliminates the problem of “stick-slip” in which higher breakaway friction causes undesirable vibration.

Dielectric properties. MAGNAPLATE HCR exhibits excellent dielectric characteristics without affecting the high conductivity of the substrate. Its performance as an insulator is excellent. Because the proprietary engineered polymers impregnated into the coating do not absorb water, volume resistivity values remain unchanged even after prolonged water exposure.

Thermal conductivity. Enhanced aluminum exhibits rapid heat and cold transfer. By converting an original single flat aluminum crystal into millions of surface facets, MAGNAPLATE HCR permits heat distribution within the encapsulated outer surface that surpasses that of untreated aluminum.

Design considerations. Almost all cast, forged, extruded or wrought aluminum alloys can be treated. Alloys that contain less than 5% copper and 7% silicon and do not contain lead are most suitable for the application of an HCR coating. The degree of hardness, penetration and color varies with each alloy, with the processing temperature, and with the coating thickness.