

MAGNAPLATE®

Synergistic and high-tech surface enhancement coatings

Protect metal parts against wear, abrasion, corrosion, friction, sticking and galling.



Magnaplate-applied “synergistic” coatings improve the performance of metal parts by enhancing them with a permanent, harder-than-steel, dry-lubricated non-stick surface. These proprietary coatings, originally developed to solve performance problems in NASA’s space program, now extend the service life and increase the operational performance of metal parts in an endless list of applications.

Problem-solving benefits of synergistic coatings!

- Prevent mechanical wear, abrasion and galling by providing a super-hard, dry-lubricated surface
- Resist corrosion and attack by chemicals, acids and exposure to hostile atmospheres
- Provide exceptional mold release performance
- Improve material flow and sanitary maintenance by eliminating sticking and product “hang-up”
- Won’t chip, peel or flake, like “paint-ons” do
- Some meet FDA, USDA, NSF and AgriCanada codes
- Impart high dielectric strength where needed
- Allow the use of less expensive basic metals as a substrate

What are “synergistic” coatings and how do they work?

“Synergistic” coatings are created during a multi-step process that starts with a series of specialized cleaning treatments which are followed by enhancement of the substrate’s surface through conversion, deposition or by

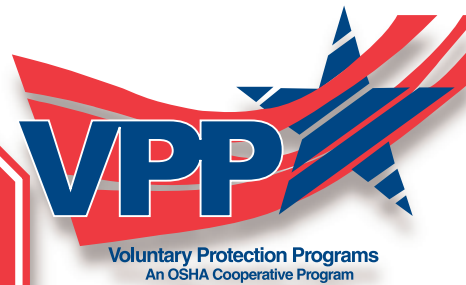
thermal spraying — depending on the coating. The process continues with a controlled infusion of selected engineering polymers or other dry-lubricating particles. These particles are then mechanically cross-linked and locked in by a proprietary process and become a permanent, integral part of the newly enhanced surface layer. Since the resultant surface is superior in performance to both the base metal itself and any of the individual components used in the enhancement technology, Magnaplate coatings are considered “synergistic.”

Coating systems

Each of the following Magnaplate-applied surface enhancement technologies was developed to protect a specific metal or group of metals or to solve problems encountered under severe operating conditions. Each is available in a range of types to meet a diversity of requirements, and can be further adapted to solve your special metal wear problems. Magnaplate leads the industry not only in pioneering new coatings but also in establishing environmentally safe plant facilities through the installation of state-of-the-art waste treatment control systems.

Attention: Plant engineers, maintenance engineers, production managers, design engineers!

One Stop Shopping for All Your Coating and Fabricating Needs.



General Magnaplate's finishing capabilities include grinding, superfinishing, machining, polishing and diamond polishing.

If it's a new part you require, General Magnaplate will take care of the fabrication with a local partner and then coat it with one of our proprietary metal enhancement processes. General Magnaplate provides turnkey solutions and will assure the quality of the fabrication!

Avoid having your parts coated in an expensive, environmentally troublesome chrome-plating bath. If it's a worn or old part that is failing, avoid ordering expensive replacement parts and take advantage of one of our many coating services:

- | | |
|-----------------------|------------------------|
| ■ Hard anodizing | ■ Epoxy coatings |
| ■ Electrostatic | ■ Thermal spray |
| ■ Electroless nickel | ■ Titanium Nitride/PVD |
| ■ Brush plating | ■ Phosphating |
| ■ Chemical conversion | ■ Vacuum impregnation |
| ■ Passivating | ■ Mil-Spec |

Some examples of parts coated and/or restored:

- Injection and slip-casting molds
- Crankshaft and bearing journals
- Pump and compressor impellers
- Valve stems, faces and gates
- Stirrer and blender blades
- Drive shafts
- Heating and sealing bars
- Rolls and platens
- Turbocharger bearings
- Food molds, chutes and guides
- Extrusion nozzles
- Cam lobes



We accept
Visa and
MasterCard.

Magnaplate
CMPT

General Magnaplate also offers its patented all-metal CMPT® at all of its North American facilities. CMPT tools can be used for high performance lay-ups including fiberglass reinforced plastic (FRP), bismaleimide (BMI) and prepreg (GR/EP). Our specialists custom design and manufacture molds from your specifications, selecting the most appropriate mold materials based on your requirements.

Facility Capabilities at General Magnaplate Materials Technology Centers

NEW JERSEY

TUFRAM®	Dry Lubricants
TUFRAM 2000™	Electroless Nickels
NEDOX 2000®	Electrostatic Coatings
LECTROFLUOR®	Fluoropolymers/Polymers
PLASMADIZE®	Glass Bead
Magnaplate HCR®	Hard Anodize/Sulfuric Anodize
Magnaplate HMF®	HAE (Anodize on Magnesium)
Magnaplate HTR®	Titanium Anodize
Magnaplate TNS®	Nylons
MAGNASEAL®	Passivating
HI-T-LUBE®	Phosphating
CANADIZE®	Rocklinize Hard Face
MAGNADIZE®	Silver
MAGNAGLIDE®	Titanium Nitride/PVD
MAGNAGOLD®	Thermal Spray
Magnaplate SNS™	• Electric Arc • Plasma
GOLDENEDGE®	• HVOF • Flame
Chemical Conversion Coating	CMPT® Tooling Solutions (Patented)

TEXAS

TUFRAM®	Fluoropolymers/Polymers
NEDOX®	Glass Bead
LECTROFLUOR®	Hard Anodize
PLASMADIZE®	Sulfuric Anodize
Magnaplate HCR®	NDT-Zygo/Magnaflux
Magnaplate HMF®	Nickel (Watts)
Magnaplate HTR®	Nylons
Magnaplate TNS®	Passivating
MAGNASEAL®	Phosphating
HI-T-LUBE®	Rocklinize Hard Face
Brush Plating	Vacuum Impregnation
Chemical Conversion Coatings	Thermal Spray
Dry Lubricants	• Electric Arc • Plasma
Electroless Nickels	• HVOF • Flame
Electrostatic Coatings	CMPT® Tooling Solutions (Patented)

CANADA

TUFRAM®	Glass Bead
NEDOX®	Clear Anodize
LECTROFLUOR®	Hard Anodize/Sulfuric Anodize
PLASMADIZE®	Flash Chrome
Magnaplate HCR®	Hard Chrome
Magnaplate HMF®	Liquid Hone
Magnaplate HTR®	Nylons
Magnaplate TNS®	Rocklinize Hard Face
MAGNASEAL®	Passivating
HI-T-LUBE®	Thermal Spray
DYNALOY™	• Electric Arc • Flame
Chemical Conversion Coatings	• Plasma
Copper Plating	Finishing Capabilities
Dry Lubricants	• Grinding • Machining
Electroless Nickels	• Polishing
Electrostatic Coatings	CMPT® Tooling Solutions (Patented)
Fluoropolymers/Polymers	

CALIFORNIA

TUFRAM®	Electroless Nickels
NEDOX®	Electrostatic Coatings
LECTROFLUOR®	Fluoropolymers/Polymers
PLASMADIZE®	Glass Bead
Magnaplate HCR®	Hard Anodize/Sulfuric Anodize
Magnaplate HMF®	Nylons
Magnaplate HTR®	Painting
Magnaplate TNS®	Passivating
MAGNASEAL®	Polishing
HI-T-LUBE®	Thermal Spray
Brush Plating	• Electric Arc • Flame
Chemical Conversion Coatings	• Plasma
Dry Lubricants	CMPT® Tooling Solutions (Patented)

TOOLING SOLUTIONS

Tooling Solutions provides tooling, flexible tool-holding stations and permanent release coatings. CMPT is a patented all-metal tool that is available from our North American facilities and some of our offshore licensees. CMPT all-metal tools can be up to 42 feet long and 20 feet wide.

They are used for open and closed-molding with cure cycles up to 700F. Our specialists will help you determine the metal needed (aluminum to zinc including INVAR) giving you ready-for-production all-metal tooling in days instead of months. We can impregnate this tooling with permanent release coatings to fit your cure-cycle and material needs, plus offer flexible tooling support systems.

FABRICATION SERVICES

Turnkey solutions: true "One-Stop Shopping" from metal part manufacturing to coating services.

Finishing Capabilities: Grinding, Superfinishing, Machining, Polishing, Diamond Polishing

THEORETICAL RESEARCH INSTITUTE — LINDEN, NJ

Complete R&D lab performs application research in metallurgy and chemistry, electroplating, materials and processes, tribology, and polymers. Feasibility and consulting services available.

LICENSEES

JAPAN

Ulvac, Inc.
Chigasaki
TUFRAM®
NEDOX®
LECTROFLUOR®
Magnaplate HCR®

SWEDEN

Bodycote Ytbehandling AB
Katrineholm
TUFRAM®
NEDOX®
Magnaplate HCR®
Magnaplate HMF®

GERMANY

Bodycote Nussbaum
Kaufbeuren
TUFRAM®

THE NETHERLANDS

AHC Oppervlaktetechnieken
Eindhoven
TUFRAM®
NEDOX®
Magnaplate HCR®
Magnaplate HMF®
HI-T-LUBE®

UNITED KINGDOM

Poeton Industries Ltd.
Gloucester
TUFRAM®
NEDOX®
LECTROFLUOR®
PLASMADIZE®

TUFRAM®

Imparts hardness, lubricity and unusually high levels of wear and corrosion resistance to aluminum

TUFRAM coatings give aluminum a harder-than-steel, permanently dry-lubricated surface that resists corrosion, abrasion and galling. Treated parts outwear and outperform parts made of case-hardened steel, stainless steel or even hard chrome plate and are also much lighter in weight. The smooth, slippery TUFRAM surface provides superior mold release, eliminates sticking or product "hangup," and facilitates material flow and sanitary maintenance. Some coatings meet FDA, USDA, NSF and AgriCanada codes for food and drug contact.

NEDOX®

Protects most base metals, including aluminum and titanium, against abrasion, corrosion, and static buildup

The NEDOX coatings create a harder-than-steel, permanently dry-lubricated surface. The newly created non-stick surface exhibits superior resistance to abrasion, corrosion and chemical attack, as well as to static buildup, even on aluminum. Also outperforms and outwears chrome and stainless steel. NEDOX offers excellent mold release and clean-up, without the use of caustics or bleaches. Some coatings meet FDA, USDA, NSF and AgriCanada codes.

PLASMADIZE®

Unsurpassed corrosion and wear resistance for all metals

PLASMADIZE coatings offer corrosion and wear resistance unsurpassed by conventional thermal sprays. They are a composite of ceramics and metal and/or polymers which interact synergistically to yield the advantages of both the high and low modulus components. More ductile than chrome plate, they can be applied in thick or thin layers and are available with a release (non-stick) or gripping surface. Used to protect or restore all types of parts, they can be field applied. Some perform at 1300°F and some meet FDA, USDA, NSF and AgriCanada codes.

LECTROFLUOR®

For maximum corrosion resistance on parts made of any base metal or combination of metals

A series of high-tech copolymer abrasion-resistant coatings that provides maximum chemical and corrosion resistance, even in the most hostile environments — and at both high and low temperatures. Can be applied to parts constructed from two or more different metal substrates (e.g., an aluminum rod with a steel insert). LECTROFLUOR coatings exhibit superior mold release properties. Some coatings meet FDA, USDA, NSF and AgriCanada codes.

MAGNAPLATE HMF®

Imparts optimum wear performance to aluminum, steel, stainless steel, copper and other alloys

HMF creates an ultra-hard surface with a mirror-smooth microfinish. It has the lowest COF obtainable from any non-burnished metal coating system and eliminates "stick-slip" and vibration of higher breakaway friction. Also prevents generation of Lanier and stress lines. HMF exhibits exceptional anti-wear, abrasion and chemical resistance properties, is electrically and thermally conductive, and maintains its physical properties at continuous operating temperatures up to 650°F. Looks just like chrome plate, but it is not. Meets FDA, USDA, NSF and AgriCanada codes.

CANADIZE®

Hydrogen-free, super-hard, fracture-free coating for titanium and titanium alloys

The CANADIZE coating process was specifically developed to prevent any hydrogen absorption, a major problem in the surface treatment of titanium. CANADIZE coatings significantly increase abrasion resistance and wear life by augmenting surface hardness. The infusion of selected polymers or dry lubricants results in a permanently dry-lubricated surface that eliminates galling, binding and seizing and protects the coated part against chemical attack and corrosion.

MAGNAPLATE TNS®

Non-Stick, Release Coatings Prevent Residue Buildup on Adhesives, Tape, and Labeling Equipment Metal Parts

Magnaplate TNS coatings solve the "sticky substance" problems encountered so often in all segments of the adhesive industry — adhesive formulating, label printing, tape manufacturing, and converting. These high tech "synergistic" coatings were custom designed to act as a release system for all types of metal parts which come in contact with adhesives. TNS coatings stop residue buildup and prevent pressure-sensitive tapes from adhering to rollers or other parts. They eliminate cleaning delays and downtime, and help meet critical production schedules.

MAGNAPLATE HCR®

Optimum corrosion resistance and hardness for aluminum

HCR coatings exhibit exceptionally high corrosion resistance as well as ultra-high hardness for wear resistance. HCR achieves a corrosion resistance rating of over **15,000** hours as per ASTM B-117. This combination of corrosion and wear resistance broadens the range of uses for aluminum. HCR-F meets NSF and FDA standards.

MAGNADIZE®

Prevents oxidizing and galling of magnesium alloys

The MAGNADIZE system surpasses all other known methods of enhancing performance of parts made of magnesium. Permits full utilization of the advantages of this lightweight material. Eliminates oxidizing and galling, major problems encountered in most magnesium applications.

GOLDENEDGE®

Micro-thin coating maintains cutting edge sharpness

When applied to blades, knives, and other cutting tools, its thickness is controlled to within micro-inches to prevent dulling, even on 7° – 9° angles. Its fine-grain structure results in low surface tension, reducing COF. It also creates a dense, ultra-hard (Rc 80 – 85) surface that keeps edges as sharp as when they were first honed, extending blade life up to 20 times longer. Meets FDA, USDA, NSF and AgriCanada codes.

HI-T-LUBE®

World's most slippery solid prevents wear, galling and fretting, even at temperature extremes

Recognized by the *Guinness Book of Records* as the solid with the lowest COF in the world, this dry-film lubricant solves critical problems of wear, galling and fretting on steel, stainless steel and copper alloys at high and low temperature extremes, even under heavy loads. Consists of a matrix of metallic layers. Becomes a permanent, integral part of the base metal. After burnishing, it offers maximum lubricity.

MAGNAGOLD®

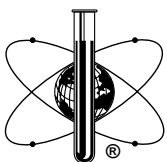
Ultra-thin coatings exhibit superior resistance to wear, chemicals, and oxidation, even at high temperatures

The MAGNAGOLD series of enhanced PVD TiN coatings is processed at low temperatures and permits use on many types of metals, without distortion or loss of substrate hardness. Extremely dense and hard, they resist abrasion up to 20 times better than stainless. They also have low surface tension resulting in low COF. A modified version of MAGNAGOLD inhibits "wetting" by lead and silver solders or brazing metal.

MAGNAPLATE HTR®

Dramatically increases mold release efficiency and wear resistance

Magnaplate HTR increases the release efficiency of steel, copper, brass, aluminum and other metals used in the fabrication of molds and dies for a wide range of industries. This surface enhancement coating creates a permanent, non-stick surface that exhibits a very low COF in addition to offering superior wear resistance. The HTR coating can also be modified to meet your special requirements for thermal and/or electrical conductivity.



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