

SPOTLIGHT Report

Food and Drug
Packaging and Processing



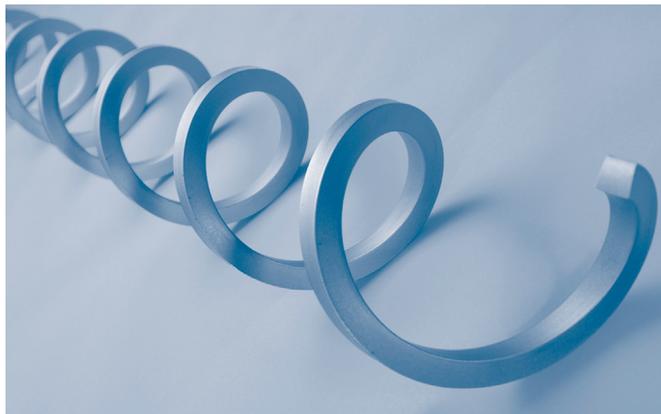
FDA, USDA and AgriCanada compliant coatings on metal parts solve sanitation, maintenance and performance problems

Magnaplate engineered surface enhancement coatings meet tough challenges for contact surfaces in food and drug industries

Demanding Challenges

Food and drug packaging and processing equipment must meet numerous rigid standards drawn from a long menu of performance criteria. General Magnaplate – a pioneer in the surface enhancement of metal parts to meet the rigors of space exploration – applies its expertise in surface enhancement to these down-to-earth applications.

Actual case histories show that whatever the situation – from the automatic



Magnaplate coated a feeder auger with NEDOX to provide it with excellent release properties to prevent dough from sticking.

packing of raw beef to the extrusion of dry ice pellets; from forming, cutting, cooking and baking foods to filling and sealing packages, General Magnaplate's coatings will make production more efficient, cost-effective and profitable. Our technical talents are focused on solutions to many varied but critical food and drug processing and packaging problems.

In addition to coating existing parts to improve wear and performance, General Magnaplate also has a "One Stop Shop" program. By working with select qualified partners, we can provide turnkey solutions to have new parts fabricated and coated, or have damaged or worn parts repaired and coated.

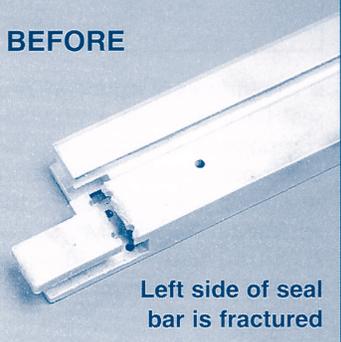


Coatings criteria in food and drug applications:

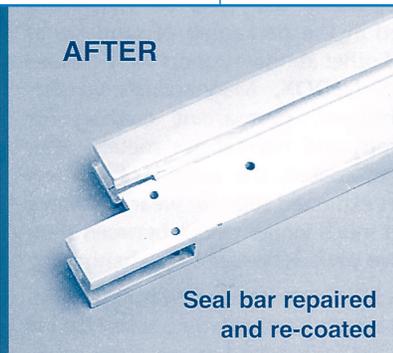
- Surface hardness should produce long service life for parts and surfaces by protecting against wear, abrasion, corrosion, friction and galling.
- Coatings must comply with USDA, FDA and AgriCanada codes.
- Coating surfaces must be non-oxidizing in adverse environments when processing equipment is idle.
- Sanitary clean-up must be thorough, easy to perform and, ideally, non-polluting.
- Surfaces must be dense and non-porous to prevent growth of mold and bacteria.
- Coated surfaces should be non-stick to prevent product hang-up and assure efficient mold release.
- Coating must not contaminate product.
- Surfaces must be non-reactive to atmosphere and spills.
- Where chrome plating has traditionally been applied, coating should eliminate chrome's dangers and its effluent headaches.
- Specialized surfaces such as blades, knives and slicers should stay sharp despite heavy use.

BEFORE

AFTER



Left side of seal bar is fractured



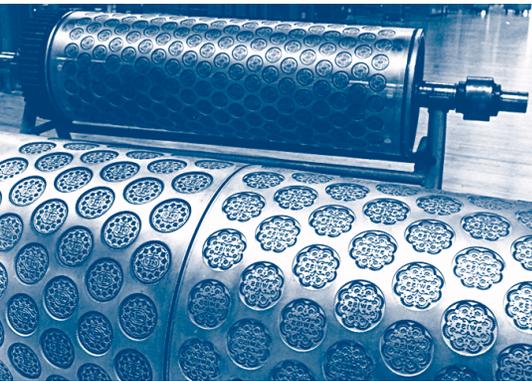
Seal bar repaired and re-coated

Food Applications

Preventing Sticking and Wear of Rotary Cookie Molds

A cookie manufacturer suffered excessive downtime because wet cookie batter was sticking in the impressions of the brass cookie molding rolls. Also, as engraving in the expensive rolls wore away due to the continuous abrasion by the dough, the identifying pattern embossed on each cookie became dimmer and dimmer.

A quick but long-term solution was needed. The manufacturer's engineers turned to General Magnaplate, who applied a NEDOX® coating that hardened the surfaces of the brass rolls and provided them with critical wear resistance. The coating also gave the roll surfaces anti-stick, anti-corrosion performance that prevents hang-up of the wet batter.



Brass rolls for molding cookies on a high-speed production line were coated with a NEDOX® "synergistic" coating to give longer life to the expensive rotary molds, to prevent dough hang-up by providing mold release, and to make the molds easy to clean.

Substantial savings were achieved by reducing production downtime required to clean the rotary molds, and by extending their life cycles.

Candy Bars

Warm caramel was sticking to slitter blades during candy bar manufacturing, causing buildup and strips of caramel to jump out of alignment. A coating of LECTROFLUOR® was applied to the



These bronze forming rolls for dog biscuits require a non-stick surface and resistance to abrasion from the product. Both characteristics are provided by a NEDOX® surface enhancement coating.

long round blades, eliminating the need to have an employee monitor the machine and constantly scrape the blades.

Cleaning of Pasta-Making Machines Made Easier

Automatic forming, filling and cutting machines for making ravioli at a pasta manufacturer were questioned by an inspector because heavy structural sections were made of cast iron. The inspector considered the components too difficult to sanitize effectively.

The company and General Magnaplate worked together to solve the problem. First, about 80% of the cast iron and steel parts were thoroughly cleaned by a special process. They were then coated with NEDOX to make them impervious to fats and oils, easy to clean and non-corrosive. Bronze parts and stainless steel rollers were also coated to create non-stick surfaces and improve cleanability.

The manufacturer saved thousands of dollars by avoiding the need to purchase new machines.

Ice Cream Packaging

A creamery was having problems with corrosive attack on a packaging machine's turntable holding plates. Caustic cleaners were causing the aluminum parts to pit and corrode. Sanitary clean-up was also a time-

consuming procedure further complicated by the need to responsibly dispose of spent cleaning and sanitizing solutions. By having TUFRAM® applied to the holding plates, the creamery was able to avoid these troubling problems.

Cereal

A fruit and sugar coating on a cereal product was sticking to a chute, causing the cereal to back up onto conveyors during transfer to packaging lines. The sticky topping also led to a prolonged cleaning process. NEDOX was applied to the chute to ease product flow and significantly reduce cleaning time.

Tortillas

Wet, sticky tortilla dough was searing to press plates making them difficult to remove in one piece. Several conventional solutions were tried such as oils and sprays without success. A TUFRAM coating was applied, giving the press plates the release properties necessary.

Baked Beans

A set of three hoppers, sitting one on top of the other, feeding into the one below, measure cooked beans by weight. A sticking problem was causing the customer to have to re-tare the scale every few runs. PLASMADIZE® on the hoppers enabled the beans to fall through, helping the customer towards their goal of about 3000 pounds of cooked beans per minute.

Cookies

A customer with steel dough troughs used to mix cookie dough needed a solution for corrosion resistance and easy clean-up. PLASMADIZE provided superior release from the dough. Twin augers were then coated with NEDOX, which gives the added benefit of lower energy usage due to less "drag" on the coated augers while mixing the dough.

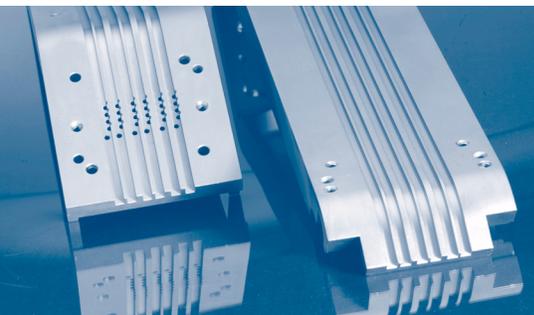
Pharmaceutical Solutions

Coating Solves Severe Mold Release Problem

A contract packaging services company produces thermoformed plastic sheets with multiple cavities for individual tablets, capsules and caplets. After the custom-designed cavities are filled and sealed with foil, the sheets are cut into strips and packaged either for OTC sale or for use as physician's samples, hospital unit doses, or clinical study packages. Individual cavities can also be die cut.

The problem they faced is that the films tend to stick to the aluminum tooling after being thermoformed. Because each sheet of thermoformed film contains numerous cavities, and even if only one cavity is ruined because the tooling sticks to and tears it, the entire sheet of film must be discarded.

General Magnaplate's NEDOX provided a dry lubricating coating that solved the problem. NEDOX creates a dense, non-porous surface, also eliminating the potential growth of mold and bacteria.



Pill guide plates used in pharmaceutical form/fill/seal machine. NEDOX prevents product hang-up, keeping flow rates steady.

Aluminum Fillers with the Toughness of Steel

A supplier of packaging equipment to the pharmaceutical and cosmetic industries makes extensive use of Magnaplate coatings for improving wear characteristics, reducing friction, and providing inert surfaces where chemically active material might contact the equipment components.

One application is a filler designed to handle irregularly shaped containers. Its reciprocating head is timed to move with the conveyor belt so that the filling nozzle can enter, fill and leave the container without touching it. They wanted to use aluminum for the filler heads, but could not until General Magnaplate applied a TUFRAM coating that allows the aluminum heads to withstand the friction encountered between the moving parts of the assembly.

Preventing Corrosive Attack on Centrifuge Baskets

When engineers at one pharmaceutical equipment manufacturer embarked on a re-evaluation of their manufacturing facilities, they focused on an 8' diameter center slung centrifuge, featuring a perforated basket that holds in-process pharmaceuticals.

They anticipated corrosive attack from acids, bases and solvents. To prevent the attacks, the centrifuge was treated with a corrosion-resistant LECTROFLUOR coating.

Faster Production Speeds on Pouch Packing Lines

A packaging equipment manufacturer supplies a variety of pharmaceutical companies with vertical and horizontal form-fill-seal machines for pouch packaging of viscous and aqueous liquid products, tablets, pre-moistened applicators and sterilizable hospital disposables in seal and peel-open pouches.

The machines feature sealing head components and other key parts coated with a variety of General Magnaplate's coatings to increase operating speeds without excessive wear of the parts.

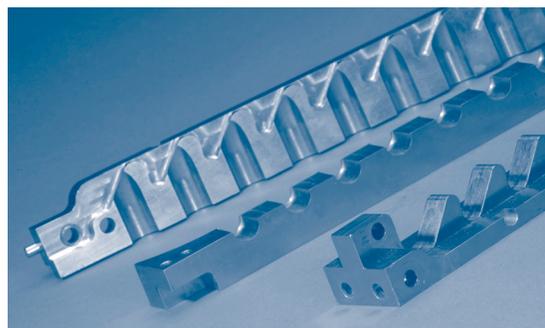
Aspirin Tablets

Forming rolls which create blister packages are coated to prevent pick-

up of freshly printed ink on the passing films. The throat of the machine is also coated to prevent dust accumulation from the motion of the tablets as they are conveyed from hoppers. The coating also prevents marking of the tablets, which would occur if they were exposed directly to the metal.

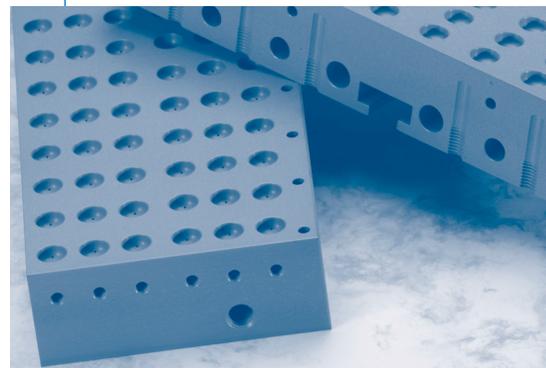
Blister Packaging

A manufacturer needed to protect a three-piece mold which thermoforms blisters from PVC/PVDC laminates in form/fill/seal machines. MAGNAPLATE



NEDOX was used on these lipstick mold parts to ease clean-up of residues left from the molding process. The smooth NEDOX surface increased product quality and appearance by minimizing pinholes and blemishes on the lipstick.

HCR® provided the non-stick properties and resistance to the hydrogen chloride fumes given off from the laminate in the pre-heat station.



HCR was used on this forming tool for form/fill/seal blister machines because it is highly resistant to gases emitted from PVDC laminates film.

Magnaplate Coating and Repair Program for Sealing Equipment Squeezes the Most Out of Your Tooling Dollar!

Magnaplate Sealing Equipment Repair Capabilities

General Magnaplate's surface enhancement coatings create a super-hard, dry-lubricated surface on heat sealing equipment parts. These permanent, non-stick coatings protect sealing bars, jaws, dies and other sealing parts against abrasive wear and corrosion, dramatically extending their service life. They eliminate the need to constantly apply and reapply "non-stick" tapes which wear out rapidly and frequently become messy. Their slippery surface prevents plastic and other materials from adhering or bonding to the parts and facilitates cleanup and sanitary maintenance, without the use of caustics or harmful chemicals.

Exclusive Benefits

- "One Stop" service for seal tooling requirements — manufacture new parts and coat, or repair and coat existing tooling at a fraction of the cost of replacement

- Extend wear and service life
- Avoid downtime and cost of replacing "non-stick" tape
- Improve wear resistance
- Enhance release properties through dry lubrication
- Resist corrosive attack from chemicals
- Many meet FDA, USDA and AgriCanada codes
- Reduce bonding of plastic to metal

Some Examples:

- A large manufacturer and refurbisher of packaging machinery had severe abrasive wear problems with sealing jaws used to seal potato chip bags. The abrasion was caused by the foil bags continuously sliding over the sealing jaws. A NEDOX wear resistant, non-stick coating resulted in dramatic improvement in wear life and in the ability to eliminate residue buildup.

- A pharmaceutical manufacturer was experiencing difficulties caused by glue adhering to seal bars during the heat sealing of polyethylene bags. A PLASMADIZE coating with a very high coefficient of friction was applied which totally eliminated any sticking and also accelerated operating speeds.
- A food manufacturer had sticking issues and a premature end to the service life of hot knife seal bars on their packaging machines. The application of Magnaplate's LECTROFLUOR coating gave the knife bars superior release properties and eliminated the sticking problem. It also dramatically extended their service life.

Keep Cutting Edges Sharp with GOLDENEDGE®

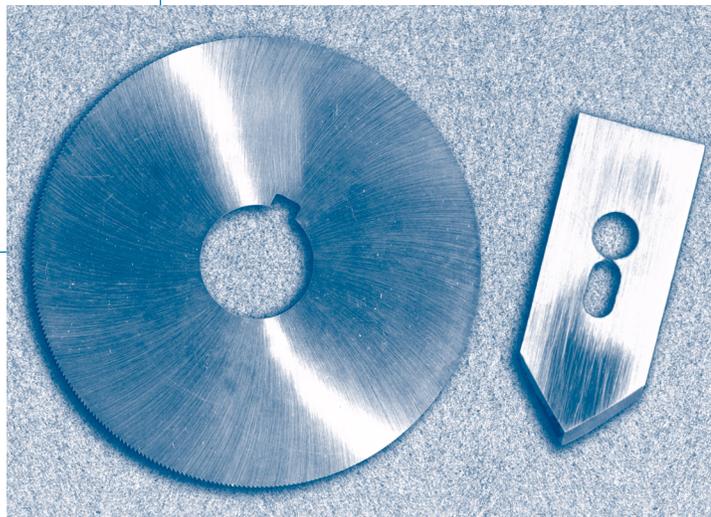
Ultra-hard, micro-thin GOLDENEDGE on the cutting edges of blades, knives, slicers and other sharp-edged devices resists wear and abrasion, extending service life by as much as 20 times.

GOLDENEDGE Benefits

- Increases surface hardness up to an equivalent of Rc85
- Resists corrosive attack by acids and alkalis

- Meets USDA, FDA and Agri-Canada codes
- Non-stick surface cleans up easily, with just water
- No restrictions on shapes of cutting surfaces
- Permanent mechanical interlocking with substrate

Increase blade life and improve production speeds during operations such as:



shredding, cutting, dicing, die cutting, disintegrating, flaking, forming, eviscerating, filleting, deheading, gutting, grinding, scaling, peeling, packaging, pulverizing, sawing, slicing ... and many others.



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