General Magnaplate

Spotlight Report

Packaging Machinery

High-tech coatings enhance the efficiency and performance of packaging equipment

FDA, USDA, NSF & AgriCanada-compliant coatings provide hardness, corrosion resistance, dry lubricity and long life for all types of metal parts on machinery.

Packaging engineers face a wide variety of challenges when it comes to maintenance and operation of a broad spectrum of machinery counted on to perform such tasks as wrapping, sealing, cutting, forming, pouching, blister packing, folding, strapping, trimming, filling, and conveying. Some of those problems include:

■ Poor lubricity and premature wear of folding plates on overwrap machines can cause skewed overwraps, bubbles and machine jams.

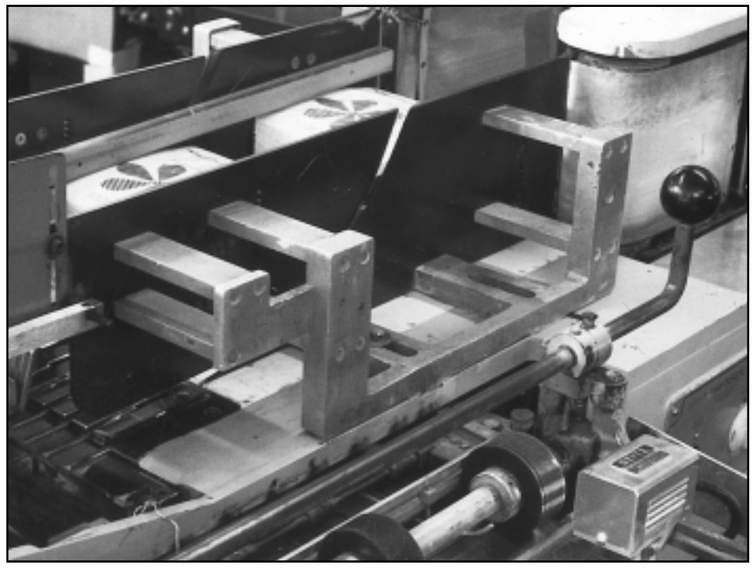
■ Abrasive wear of nozzle collars, cross sealers, quench sealers, filling nozzles and side sealers can stop packaging operations cold or shorten the useful life of the machinery.

■ Accumulations of adhesives, glues, packing films, inks and product residues can "gum up" packaging equipment surfaces, necessitating frequent shutdown and maintenance of equipment.

■ Friction on the surface of metal parts used on hoppers, chutes and other conveying equipment can cause product backups and bring packaging operations to a halt.

And if those challenges aren't enough, special needs — such as cigarette packages which feature foil panels and embossed hot stamping — place special demands on the packaging engineer and the equipment for which he or she is responsible.

It is the recognition of wear, abrasion, corrosion and release problems such as these that has caused engineers across the country and around the world to turn to General Magnaplate Corporation for solutions — in the form of their specialized, high-tech, "synergistic" surface enhancement coatings.



Magnaplate HCR® "synergistic" surface enhancement on Marcal Paper's overwrap equipment gives folding plate parts superior resistance to corrosion and wear. (Story on page 2)

How do the coatings work?

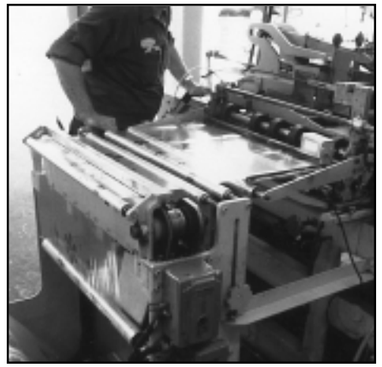
High-tech Magnaplate-applied coatings are impregnated into the substrate of packaging machinery component metal parts through a series of proprietary steps that include an infusion of selected engineering polymers.

Unlike "paint-ons," these coatings become an integral part of the base metal and won't chip, flake, peel or rub off. They are called "synergistic" because the resulting surface is superior in performance to the base metal or any of the individual coating components.

A wide diversity of coatings is available for application on specific types of metal substrates. Each meets special performance requirements for preventing wear, abrasion, corrosion and chemical attack. They each feature an extremely low coefficient of friction to reduce galling of mating parts and to prevent any material from adhering to the equipment during the packaging operation.

Many of the coatings meet USDA, FDA, NSF, and AgriCanada codes, making them excellent selections for enhancing the performance and wear life of all kinds of metal parts on food or drug packaging machinery. Their non-stick properties make sanitary clean-up a relatively simple matter of fresh water rinsing.

Here are just a few of the packaging equipment part performance and maintenance challenges Magnaplate coatings have solved.



Side folding plates (left) and bottom fold plates (right) on the over-wrap machines used to wrap Marcal Paper's pocket tissue packs have been protected with Magnaplate HCR® to resist wear and reduce down time.

Folding plates

Coating avoids abrasion and corrects skewed overwraps

Marcal Paper Mills, Inc., Elmwood Park, NJ, was facing the challenge of skewed overwraps, unsightly bubbles, and out-of-square labels. Packaging engineers saw these problems as a forewarning of impending machine jams and resolved to do something about the challenge before the packaging problems spilled over into customer dissatisfaction for the company's high-quality napkin and facial tissue product lines.

Engineers knew that they were facing packaging problems frequently encountered wherever polyethylene overwraps are applied in high-speed packaging operations. They also knew that the prime source of the problem was abrasive attack on metal surfaces by microscopic-size particles of residual paper dust carried along by the polyethylene sheet. The result over time was uneven machine wear and film jamming.

The machine parts most susceptible to uneven wear were the aluminum bottom plates on the wrappers, the underfold plates and the side folding plates — depending upon the type of packaging equipment involved.

The packaging engineers knew what they had to do. They needed to find a protective, anti-abrasion coating that could be applied to exposed metal surfaces to not only resist abrasive attack, but also lubricate the folding plates.

Such a coating would extend the replacement free service life of their packaging equipment's parts even beyond the normal span of a new unit, according to a company source. It would also eliminate costly downtime problems.

"We knew exactly what we had to have," said Marcal's director of converting. "We needed to find a double-characteristic coating that would be so ultra-hard that it would, first, make the susceptible aluminum packaging machine parts become as wear-resistant as stainless steel. Second, we wanted those coated parts to exhibit a level of lubricity that would diminish the generation of friction and eliminate drag in the same way a proprietary non-stick tape does.

"It didn't take us long to make up our minds once we learned about and evaluated Magnaplate's HCR® synergistic coating."

Magnaplate HCR is a high-tech, multi-step coating that gives aluminum an ultra-hard, corrosion resistant, non-stick surface.

"The extended machine-part life we achieved as a result of the coating of our initial test units," reported Marcal's director of converting, "has led us to coat the wear surfaces of all our packaging machines with Magnaplate HCR."

New cigarette pack

Easily scratched poly film complicates packaging

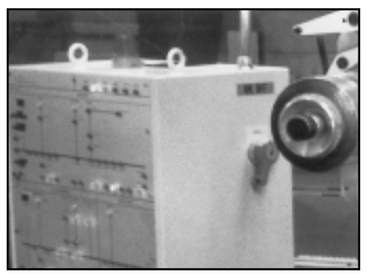
Throughout the packaging industry it is generally true that the more attractive and distinctive the package, the more difficult it is to produce on high-speed, high-volume packaging equipment. An entirely new package developed for a new brand is bound to compound all the normal problems many times over.

The attractive cigarette pack that Philip Morris created for its Benson & Hedges 100's DeLuxe Ultra Lights in a flip-top box was certainly no exception.

Packaging such boxes normally requires special attention to avoid scratches on the film and scuffs on the blank, but the unique construction of the DeLuxe Lights pack blank compounded the problem. In addition to the highly reflective surface and the embossed crest, the clear polypropylene film had to be free of scratch marks.

Adding a protective coating to the packaging machine parts seemed the obvious answer to the problems, but conventional coatings such as nickel, chrome and similar attempts from past experience did not solve them. Either the scratches in the polypropylene overwrap caused a clouded image or the sensitive packaging coating was scratched. When those mishaps didn't happen, the raised, embossed crest was badly scuffed or smudged even before the overwrap was applied.

Philip Morris engineers remembered that a Magnaplate "synergistic" coating had solved a similar packaging machinery problem for them in the past. It occurred to them that if



Mirror-smooth Magnaplate HMF® coating on Philip Morris' cigarette packaging machine parts prevents scuffing, scratching or clouding of crystal clear polypropylene overwrap, reflective foil panels, and embossed 3-D crest .

Cigarette-making machine parts are coated to eliminate scratching of film and package.

Magnaplate could keep dried packaging glue from adhering tenaciously to glue pots, then they should be able to come up with a coating that would be smooth enough and exhibit a sufficiently low coefficient of friction to handle the cigarette packaging problem, too.

Magnaplate's engineers developed a new coating called Magnaplate HMF™ that imparts an ultra-hard, mirror-smooth micro finish surface with the lowest coefficient of friction obtainable from any non-burnished metal coating system.

Unlike conventional coatings which were considered and rejected, Magnaplate HMF coatings cannot chip, flake, peel or be rubbed off. Important to the ease of cleaning, speed of production, and the smoothness of the cigarette machine parts, very few solid substances will permanently adhere to a Magnaplate HMF coated surface. And while some tacky materials may exhibit some temporary adhesion, almost all substances release easily.

It is this attribute that makes such "synergistic" coatings particularly advantageous when employed in conjunction with the sensitive packaging materials used in Benson & Hedges DeLuxe Ultra Lights. The Philip Morris engineers had early on discovered that not only would grooves and scratches in the machine parts cause problems to arise in the packages' appearance, but any pip or protrusion on the surface of the metal would be similarly destructive to the smoothness and clean appearance the packages demanded.

The attention-getting new Benson & Hedges package, with its richly burnished colors, its highly reflective finish, and its crystal clear overwrap gives dramatic proof that Philip Morris' packaging engineers have indeed met this major packaging challenge.

Strapping machine

Aluminum and steel surfaces face abrasive wear problems

FMC Corporation's strapping machines, known for their reliable, high-volume strapping capabilities, subject both steel and aluminum components to the potential for excesive abrasive wear.

Aluminum yoke and a variety of steel components on FMC's high-volume strapping machine are protected against abrasive wear by Magnaplate "synergistic" dry-lubricated coatings.

Polypropylene strapping is automatically fed around the entire aluminum yoke of the machinery and tensioned to a pre-set pressure before being sealed and cut off.

The FMC strapping machines can apply up to 18 straps a minute — provided the steel and aluminum surfaces involved can maintain their smooth, unhampered action. Experience has shown the company that the best way to assure that is by coating the aluminum yoke with Magnaplate's TUFRAM® and the steel components with NEDOX® to permanently lubricate and protect the path traveled by the strapping during the high-speed strapping operation.

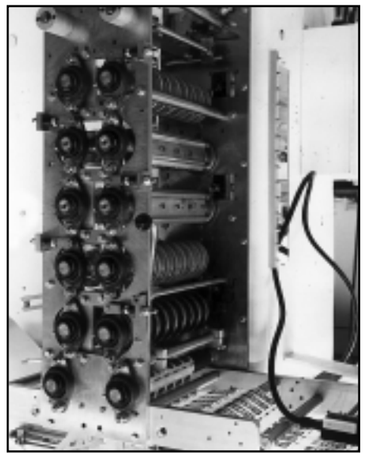
Pouch packing

Faster production speeds with Magnaplate coatings

A leading manufacturer of packaging equipment supplies a variety of drug and 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 permanent seal and peel-open pouches.

According to the manufacturer, the machines feature sealing head components and other key parts whose surfaces have been improved by synergistic coatings. The coatings permit the machines to operate at significantly higher speeds without experiencing excessive wear of the parts.

Production speeds on form-fill-seal pouch packaging machines were dramatically improved, without experiencing excessive wear, after the sealing head and other parts were enhanced by a Magnaplate coating.

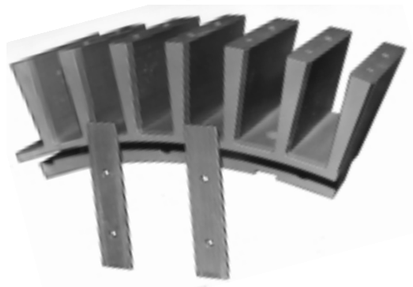


Separator fingers

Wear of aluminum reduces efficiency of packaging

The abrasive action of paper products being collected between the aluminum fingers of a packaging machine's separator caused a severe wear problem that impacted on the efficiency of operations.

The problems were eliminated by coating the fingers with Magnaplate HCR, a surface enhancement coating exhibiting exceptionally high corrosion resistance as well as ultra-high hardness for superior wear resistance.



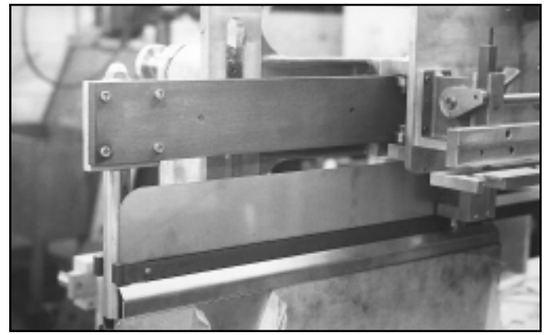
A Magnaplate HCR® coating on the aluminum fingers of a separator eliminated a severe wear problem caused by abrasive action of paper products which were being collected in the separator.

Forming rolls and throats

Abrasion prevention frees pharmaceutical product flow

The Ivers Lee Division of Becton, Dickinson and Company specified Magnaplate coatings from the start when manufacturing its UtiliPack Machine, the BFH. The forming rolls, which vacuum-shape the passing web of film to create "pockets" and heat-seal the web to a second sheet of film to form blister packages, are coated to prevent pick-up of freshly printed ink on the passing film.

The "throat" of the machine is also coated. This is where aspirin and similar products are conveyed from the twin round hoppers at the top of the web of film in which they are to be sealed. Coating the throat prevents accumulation of dust from the motion of the tablets and also prevents marking of the tablets — which would occur if they were exposed directly to the metal.



Aluminum coating bar on Cozzoli Machine's continuous filler is protected from wear and corrosion by a TUFRAM® coating.

Filling machinery

Aluminum surfaces require the toughness of steel

Cozzoli Machine Company is a major supplier of packaging equipment machines to the pharmaceutical and cosmetic industries. It makes extensive use of Magnaplate coatings for improving part wear, reducing friction and galling, and providing inert surfaces where chemically active materials might contact the equipment components.

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

Similar solutions using TUFRAM for aluminum and NEDOX for stainless steel were applied to drive and idler wheels and plugging heads, as well as to stainless steel and aluminum parts on hoppers and chutes in a line of high speed stoppering machines.

Bagging chute

Abrasive wear causes back-up of diaper production

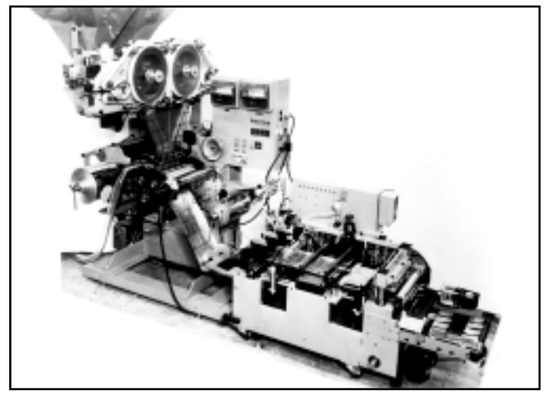
A leading manufacturer of diapers and feminine hygiene products in Canada was encountering packaging operation slowdowns because of a serious wear problem.

Assembled diapers are sent down a conveyor and accumulated automatically in the precise quantities to be packaged. Bagging is initiated when an aluminum arm pushes the accumulated diapers down a stainless steel chute and into the bag attached to the end of the chute.

The problem occurred when the arm scraped against the sides and bottom of the chute, leaving material on the chute and creating friction that slowed down the speed of the packaging operation.

After trying several options, the packaging engineer reduced the size of the arm and had Magnaplate coat the sides and bottom of the chute with PLASMADIZE®.

The wear and friction problems were solved and the packaging efficiency restored.



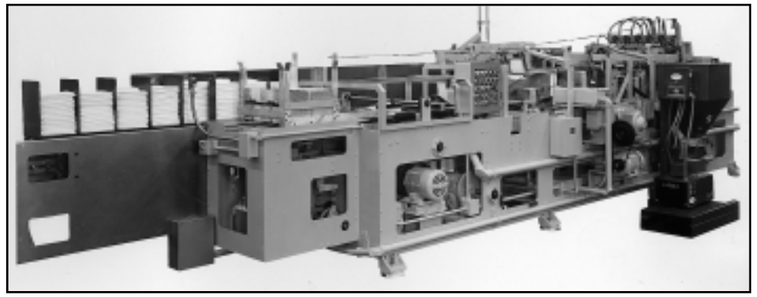
To prevent pick up of freshly printed ink and to prevent dust accumulation, two critical components of this Ivers Lee blister pack machine, the forming rolls and the throat, were protected by Magnaplate coatings.

Intermittent motion packer

Poor lubrication in buckets stalls diaper packing

One company's intermittent motion packaging machinery utilized aluminum buckets to transport disposable diapers into packaging cartons. Without adequately dry-lubricated bucket surfaces, cartons were being shorted.

The solution was a Magnaplate-applied TUFRAM coating.



Wear problem on chutes on a diaper bagging machine is solved with a Magnaplate coating.

Heat seal and knife bars

Abrasive wear snags potato chip packaging

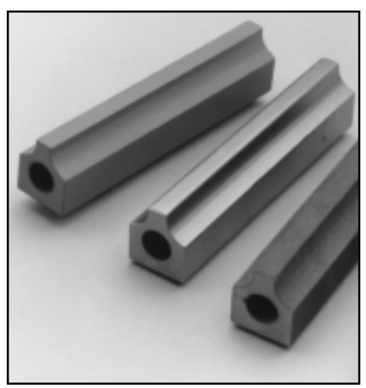
A large manufacturer and refurbisher of packaging machinery was experiencing severe wear problems involving sealing and knife bars used to package and heat seal potato chip bags. The problem stemmed from extensive abrasive wear caused by the continuous sliding of the foil chip bags over the bars.

Magnaplate was asked to apply one of its wear-resistant, non-stick coatings. The result was a dramatic improvement in wear life, as well as in the parts' ability to stay free of build-up. This helped the manufacturer market more efficient and dependable packaging equipment.

Binding, sealing machines

Plastic sticking problems causes bottlenecks

One packager was confronting a problem with hot melt adhesive sticking to guides on a binding machine. The problem was causing excessive machine wear and also causing bottlenecks in the packaging operations.

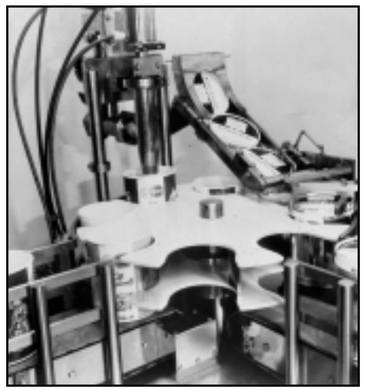


Magnaplate coatings improve wear and performance of heat sealing bars like these.

Another packager was faced with sealing bars that were sticking during the heat sealing of polyethylene bags.

Magnaplate solved the problem for the two manufacturers by coating both the guides and the sealing bars with PLASMADIZE. This high-tech surface enhancement coating features unsurpassed wear resistance, excellent corrosion resistance and permanent non-stick dry lubricity for all base metals.

The PLASMADIZE coating prevented adhesive residue build up on the guides and eliminated sticking on the heat sealing bars. The coating also increased abrasion resistance on the parts and extended their wear life.



On a Sealrite ice cream packaging machine, a TUFRAM® coating prevents caustic cleaners from pitting and corroding the aluminum turntable holding plates.

Aluminum holding plate

Corrosion, clean-up problems in ice cream packaging

Before turning to Magnaplate, a creamery was having problems with corrosive attack on its Sealrite ice cream packaging machine's turntable holding plates. The caustic cleaners were causing the aluminum components to pit and corrode. In addition, sanitary clean-up was a time-consuming procedure further complicated by the need to responsibly dispose of spent cleaning and sanitizing solutions.

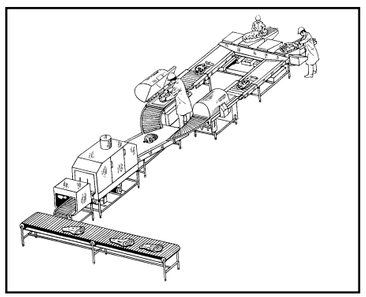
By having Magnaplate apply one of their food contact-approved TUFRAM coatings, the creamery was able to avoid these troubling problems.

Meat packing machinery

Icing problems call for Magnaplate treatment

Operators at the Cryovac Division of the W. R. Grace Company were experiencing vacuum-port icing problems on their new, high speed automated beef packaging equipment.

They contacted Magnaplate's engineers who recommended one of their FDA,USDA, NSF and AgriCanada-compliant TUFRAM coatings for the vacuum seal aluminum lid enclosures and other aluminum components. The harder-than-steel, non-stick coating made it possible to eliminate vacuum-port icing that caused a production bottleneck. Vacuum sealing speed was increased by over four times. The coating also permitted quick and easy clean-up without the use of harmful cleaning solutions



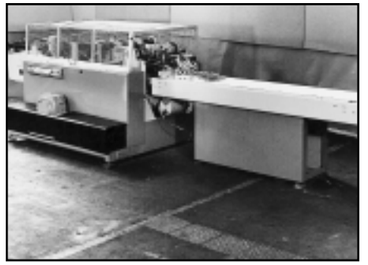
FDA, USDA, NSF, & AgriCanada-compliant TUFRAM® "synergistic" coating eliminates vacuum-port icing problems on high-speed raw beef packaging machines at W.R. Grace's Cryovac Division.

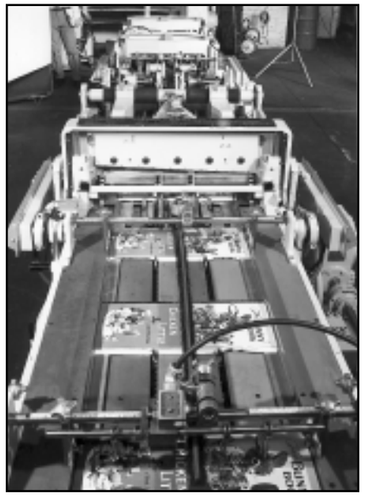
Skid plates and infeed table

Friction, corrosion, clean-up problems hurt book trimming

A manufacturer of book trimming equipment was encountering friction, corrosion, and ink and glue clean up problems on the skid plates, infeed and mailer table surfaces of its trimmers.

After Magnaplate applied one of its dry-lubricated TUFRAM coatings, friction was dramatically reduced. The coating also prevented corrosion and permitted quick and easy clean up of both the ink and the glue.





Wear, friction, corrosion and clean up problems on book and magazine handling and packaging equipment are solved by Magnaplate surface enhancement technology.

Ink pan, splash guard

Package printing plagued by gummy ink residues

A packager was having problems with its package printing operations. Accumulations of gummy, half-dried ink at the ink pan and splash guards were causing excessive ink consumption and poor reproduction.

A NEDOX coating permitted the ink which splashed on the guards to return immediately to the pan. Clean-up of the guards and pan became quick and easy and printing quality was restored.

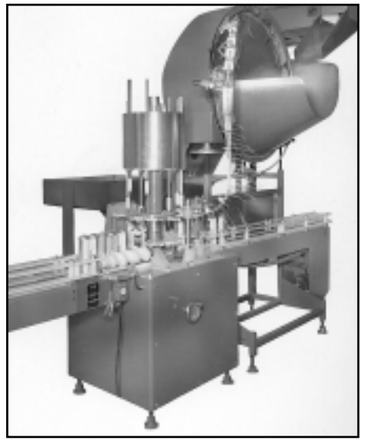
Aerosol valve placer

Abrasion problems plague aerosol packager

The installation of aerosol valves is a demanding and sensitive business. To compound the challenge, one manufacturer was having problems with abrasive wear on the spindle assembly and disc sorter.

A Magnaplate-applied coating of TUFRAM produced a super-hard, non-peeling surface that eliminated the problem of premature wear.

Wear problems on the aluminum spindle assembly and disc sorter of this aerosol valve placer were corrected with a Magnaplate-applied TUFRAM® coating.

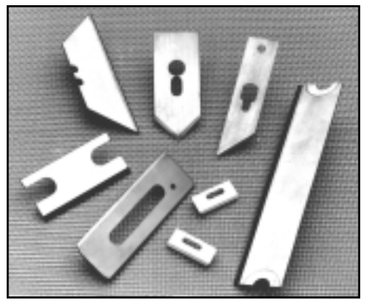


And that's not all...

Besides improving the performance of a broad spectrum of packaging machines and equipment components, Magnaplate's "synergistic" surface enhancement coatings also are recommended for a wide variety of other equipment and machinery parts and components to assure efficient, profitable production and consistent product quality.

We offer many other ***Spotlight Reports*** and application-specific literature which detail Magnaplate surface enhancement solutions. Here are just some of the equipment and machinery component solutions described in our literature:

- Air compressor components
- Coin blanking dies
- Chrome replacement
- Computer chip carrier handling
- Dry ice extruder components
- Food processing discharge chutes
- Gas blowers and exhausts
- Knives, blades and slitters
- Pallet loader slats
- PET bottle molds
- Soldering equipment parts
- Paper, film, foil converting
- Heat sealing dies



A GOLDENEDGE® surface treatment on knives, blades, slitters and other cutting and trimming tools increases wear life up to 20 times.

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