TRIBOSHIELD® POLYMER COATINGS

THE FUTURE OF ECO-FRIENDLY POLYMER COATINGS SOLUTIONS STARTS HERE

RoHS compliant
Across many markets, manufacturers are facing greater demand to deliver better solutions faster than ever that both last longer and meet higher performance expectations. However, complex shapes and surfaces create challenges for engineers searching for solutions that provide the performance they need while offering freedom of geometry for sliding surfaces.

Nowadays, with the higher level of automation, higher process reliability is required.

- Short assembly time
- Shorter cycle times
- Dimensional control
- Robust tribological performance

Although polymer coating technologies have been widely employed in corrosion protection of component surfaces and other applications, recent advances that deliver improved tribological properties are creating opportunities to reduce friction, increase wear life and reduce system noise.

**TODAYS COATING MARKET**

Today’s coating material suppliers are typically large, multinational corporations that formulate and sell coatings. They are experts in polymer science and material design, but have no coating capability. On the other side, coating applicators are typically small companies with expertise in processing but no formulation capability.

By combining our tribological, engineering and polymer science expertise and our legacy of innovation in plain bearing technologies, we created our line of TriboShield® standard tribological polymer coatings for a wide range of industrial applications. Able to be applied to nearly any surface for almost limitless potential, our range of TriboShield® polymers deliver improved tribological properties and are formulated to help meet these challenges and revolutionize component design and manufacturing-allowing you to take full advantage of part shape to maximize service life.

Offering the advantage of geometric freedom for sliding surfaces, TriboShield coatings can coat virtually any shape or surface; helping to improve performance through:

- Reduced friction
- Increased wear life
- Reduced system noise
- Improved corrosion resistance
THREE EASY STEPS TO OPTIMIZE PERFORMANCE

Surface Preparation
Pyrolysis, advanced thermal decomposition and grit blasting are used for optimal surface preparation.

Coating Application
With multiple coating applications, GGB can apply a range of surface solutions to meet your coating needs.

Curing
Coated components are then cured with advanced technology that surpasses average cure times.

OPTIMIZE YOUR SYSTEM PERFORMANCE

When looking for ways to improve system performance, engineers must consider a number of factors including:

- Lubrication
- Heat transfer and effect of the operating environment
- Surface and counter surface

Effect of the Environment
(Heat transfer)

Surface A: Operating conditions (stress, load, speed, temperature etc.)

Lubricant (oil, grease, air)

Surface B: counter surface

Friction and wear

EXPERIENCE THE TRIBOSHIELD® ADVANTAGE

In-House Paint Manufacture
The ability to formulate and tailor polymer coatings to control surface behavior.

Design Simplification
Allows for more simplistic design that employs fewer parts and easier assembly in complex-shaped surfaces that traditional bearings cannot access.

Most Metallic Substrates
Works with steel, stainless steel, aluminum, titanium, and magnesium (and can be considered for polymeric and composite substrates, too).

Chemical and Corrosion Protection
Features exceptional chemical and corrosion protection, offering a barrier of inert material between surfaces to extend longevity.

Freedom of Shape
Our specially formulated polymer coatings range can be applied to nearly any surface, regardless of shape and material.

Easy to Customize
Collaborate with our expert team to tailor our polymer coatings to the unique needs of your applications.

Self-Lubrication
Incorporate solid lubricants to deliver self lubricity that can help reduce and sometimes eliminate the need for additional lubrication in machine parts.

Hard Chrome Replacement
With toxicity levels, high costs, and bans likely coming soon, chemical hard chrome plating is becoming a thing of the past - making TriboMate® polymer coatings the environmentally conscious way of the future.
One - Stop - Partner

GGB OFFERS A UNIQUE SUPPORT PACKAGE TO ENHANCE THE CUSTOMER EXPERIENCE

GGB offers specialist expertise to help customers optimise their system performance and overcome tribological challenges. Our ability to formulate and tailor polymer coatings helps to control surface behaviour and deliver proprietary solutions. The package of solution design, formulation, coatings and logistics will make customer life a lot easier.

A PARTNERSHIP TO DO MORE

We take pride in working closely with customers in the early stages of design to think broadly and boldly, expanding beyond traditional surface engineered solutions to create something that’s uniquely adapted for your needs, demands, and requirements. The earlier we partner together, the more we can help you take advantage of part shape and size throughout the design process.
Product Range

**TriboShield®**

**STANDARD COATINGS RANGE**

- PERFORMANCE
- PROCESSING COMPLEXITY
- COST

**TRIBOSHIELD® POLYMER COATINGS**

**TriboShield® TS225**
Designed for low friction and high wear resistance at low to medium loads

**TriboShield® TS652**
High performance low friction polymer coating with added corrosion resistance

**TriboShield® TS741**
Offers very high load bearing capacity and low friction

**TriboShield® TS742**
Low friction polymer coating for very high load applications

**TriboShield® TS650**
High performance polymer coating for lubricated applications

**TriboShield® TS651**
Highly suitable for high-frequency/low amplitude (HFLA) applications

**TriboShield® TS801**
Low friction polymer coating for high temperature operation

**PRODUCT RANGE**

- TriboShield®TS801
- TriboShield®TS742
- TriboShield®TS741
- TriboShield®TS652
- TriboShield®TS651
- TriboShield®TS650
- TriboShield®TS225

**A SMART ALTERNATIVE TO HARD CHROME PLATING**

With high toxicity levels, high costs, and more bans likely coming in the next decade - chemical conversion coatings are becoming a thing of the past. GGB Polymer Coatings solutions are the most effective alternative.

- Longer wear life
- Environmental friendly
- Improved corrosion protection
- Subject to fewer current regulations
PHYSICAL AND MECHANICAL PROPERTIES

<table>
<thead>
<tr>
<th>SLIDING LAYER PROPERTIES</th>
<th>TS225</th>
<th>TS650</th>
<th>TS651</th>
<th>TS652</th>
<th>TS741</th>
<th>TS742</th>
<th>TS801</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Continuous Service Temperature</td>
<td>120 °C</td>
<td>260 °C</td>
<td>260 °C</td>
<td>260 °C</td>
<td>260 °C</td>
<td>260 °C</td>
<td>400 °C</td>
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<tr>
<td>Max Peak Service Temperature</td>
<td>130 °C</td>
<td>280 °C</td>
<td>280 °C</td>
<td>280 °C</td>
<td>270 °C</td>
<td>270 °C</td>
<td>450 °C</td>
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<tr>
<td>Dry Friction</td>
<td>Excellent</td>
<td>Fair</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
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<tr>
<td>Oil/Grease Friction</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
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<tr>
<td>Load Capacity</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
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<tr>
<td>Wear Resistance</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
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<td>Excellent</td>
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<tr>
<td>Curing Temperature</td>
<td>250 °C*</td>
<td>420 °C</td>
<td>380 °C</td>
<td>400 °C</td>
<td>340 °C</td>
<td>360 °C**</td>
<td>420 °C</td>
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<tr>
<td>Corrosion Protection</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Fair</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
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<tr>
<td>Chemical Resistance</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
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<tr>
<td>Recommended Applications</td>
<td>- Struts - Garden and DIY tools</td>
<td>- Hydraulic pumps and motors - Hydraulic cylinders - Fluid valves - Thrust surfaces in gearboxes</td>
<td>- Solenoid armatures - Seat mechanisms and struts - Compressors and radial piston pumps</td>
<td>- Mechanisms operating under: - Harsh chemical environments - Oil lubricated conditions - Vacuum</td>
<td>- Highly loaded mechanisms - Mechanisms requiring lifetime lubrication in dry conditions - Submerged parts requiring corrosion protection</td>
<td>- Highly loaded mechanisms - Mechanical couplings, linear guides, cutting tools, etc.</td>
<td>- Metal processing tools - High temperature valves</td>
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</tbody>
</table>

* Can be cured as low as 180 °C for special applications  **Can be cured as low as 200 °C for special applications

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- Mechanical couplings, linear guides, cutting tools, etc.
- Metal processing tools
- High temperature valves

SUCCESS THROUGH EXPERTISE

We know there’s no “one-size-fits-all” approach to efficiency. That’s why we’re always looking for new ways to tailor our products to meet a wide variety of applications - and these efforts are routinely met with outstanding results in a number of industries, from aerospace and automotive to industrial and beyond.
TRIBOMATE® PAIRED COATINGS

For optimized performance in regard of significant reduction of friction in dry conditions, improved wear life and stable performance, we offer TriboMate® paired coatings which are specifically designed to work with and enhance the performance of our polymer coating products. Pairing a TriboShield® coating with another TriboShield® coating solution or with a GGB bearing material, offers significantly reduced friction and can further extend system lifetime.

APPLICATIONS

TriboShield® polymer coatings are versatile enough to provide tribological solutions in a wide variety of applications from exoskeletons, cranes, transportation chains and solenoids to baby strollers and medical devices (such as prosthetics, dialysis pumps, display mounts and many more).