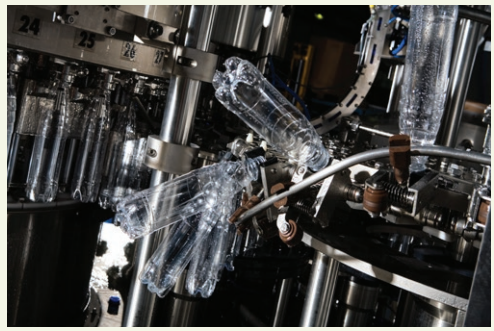
Creative Engineering Approach Solves Corrosion Issue on Bottle Washing Equipment

A partnership with TriStar gives you a competitive edge.

A large water bottling company contacted TriStar's engineers concerning some problems with their high-speed washing equipment. The water is sourced from glacial springs and has a high mineral content that was causing rapid and premature corrosion of the stainless-steel machine components.

After the customer molds the PET preform and then blow molds the finished bottle, they are loaded upside down on the rinse machine (20,000 per hour) and the water is shot into the bottle while the turret revolves at very high speeds. The bottles then move on to the filling stations.

The components affected by the unusually high mineral content in the drinking water were the spray valve cams, the cam ring and the valve stem bearings.



The challenge in this case was to find materials that would also be FDA and NSF compliant, tolerate clean-down solutions, handle high dynamic motions, and be compatible with stainless steel surfaces.

Three Unique Problems – Three Unique Solutions

- **Spray Valve Cams** – We replaced the acetal roller/sealed ball bearing combination with a Torlon 4301 roller/bearing combination. The design required a little modification to the method of installation but made for a much more reliable (albeit expensive) solution.
- **Cam Ring** – This is a large diameter (7 ft) round bar ring made of stainless steel and we developed a custom extruded snap-over C ring to cover the area where the valve cams run 24/7. The material we chose was UHMW since it is inexpensive and can be easily replaced as needed.
- **Valve Stem Guide Bushings** – These internal stem bearings see rapid open and close cycles as they produce the spray into the bottle, hold, and shut down thousands of cycles per hour. We chose Rulon 641 for this very small bushing due to its low friction, wear resistance and clean down compatibility.

These changes, in combination, successfully mitigated the corrosion issue, significantly reducing maintenance windows and cost.

We're ready to put our engineering expertise to work for you from prototype to production.

Engineering | Custom Fabrication | Manufacturing

CJ Composite

- Self-Lubricating
- Low weight | High Strength
- Chemical Resistance
- Direct replacement for Bronze

Ultracomp®

- Self-Lubricating
- High Load | Low Speed
- 54,400 PSI Compressive Strength
- Exceptional Resistance to Vibration and Impact

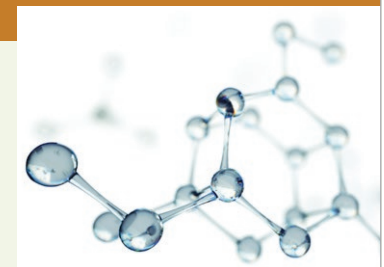
TriSteel™

- Self-Lubricating
- High Load | High Speed
- Metal Backed Bearing System
- 100% Lead Free

Rulon®

- Self-Lubricating
- Low weight | High Strength
- Low Coefficient of Friction
- Chemically Resistant

Enhanced Materials Division



- Plasma Surface Treatment
- Asymmetric & Symmetric Filtration Membranes
- Specialized Primers & Coatings
- Material ID & Selection

TriStar

Engineered Plastic Solutions™

tstar.com 1.800.874.7827

APP-SS2101 Rev. 2022A