

## GYLON BIO-ECO® PLUS

### Case Study: Progressive cavity pump



#### Industry

Pharmaceutical, Food, Beverage, Cosmetic, Chemical

#### Customer

The customer is one of the leading worldwide specialists in the field of pump technology. Progressive cavity pumps, digital solutions, macerators and control systems are used wherever low to highly viscous, aggressive or abrasive media must be conveyed at low pulsation rates.

#### Background

The increasing demand of high performance equipment in the food and pharmaceutical industry triggered the development of a new eccentric cavity pump to address the strictest hygienic requirements. Addressing these needs the manufacturer began the development of its new progressive cavity pump. As a manufacturer of high quality products they reached out to Garlock for their sealing demands.

#### Challenges faced

Production processes in the food and pharmaceutical industries underlie strict rules concerning the systems hygienic design. It is equally important for equipment manufacturer as well as the manufacturer of food and pharmaceuticals to clarify and define the hygienic requirements for various production areas. This is the only way to ensure successful cleaning of the equipment used. The customer addressed these demands and decided to have their new progressive cavity pump tested and certified according to EHEDG (European Hygienic Engineering and Design Group) guidelines Doc. 8 (Hygienic Equipment Design Criteria) and Doc. 2 (In-place cleanability testing). They turned to Garlock with the intention of using only the highest quality and most reliable sealing solutions for their products.

At the beginning of the certification there is the theoretical assessment of all components. In a second step, a cleaning test must prove that the components can be cleaned easily. The sealing solution is in direct contact with the media and therefore plays an important role ensuring the hygienic safety of the process. The test checks the residue-free CIP (Cleaning In Place) capability of components and identifies areas where product residues and microorganisms might accumulate. It is therefore of decisive importance that the sealing solution has a very smooth surface and a very high dimensional stability at all times. Materials with rough surfaces will cause the media to stick and by this endanger the cleanability. Materials with low dimensional stability will radially expand under load (after mounting). This will cause the seal to intrude into the system and by this create dead-spaces which increase the risk of media entrapment and failure of the cleaning process. To further assess the entrapment risk and ensure highest process safety also the sealing performance and the mounting capabilities of the sealing solution are tested. Only if all test requirements are fulfilled an EHEDG certificate can be issued.

#### Operating Conditions

Media: Pharmaceuticals, Food, Beverage, Powders, Dairy  
Cleaning: CIP- and SIP  
Size: DN65 - DN150  
Temperature: Up to 121 °C  
Pressure: Up to 24 bar

#### Solution and Benefits

In the pharmaceutical and food industries, the demands placed on a hygienic connection are rightly particularly high. In the area of Hygienic Sealing Solutions, Garlock has adapted to the constantly increasing requirements and customer needs. Garlock has supported the customer in finding the best possible sealing solution.

The requirements for a hygienic sealing solution are:

- » Good cleanability of the materials used
- » Dimensional stability of the sealing material
- » Good resistance towards chemicals and high temperatures
- » Compliance with the underlying regulations

For the manufacturing of GYLON BIO-ECO® PLUS Garlock uses its GYLON® Style 3522. It is manufactured by a unique manufacturing process that results in a very dense and multi-layered PTFE sealing material. It has excellent chemical resistance, excellent permeation density and unmatched cleanability due to its very smooth surface and very low surface free energy (ultra low adhesion). The surface is smoother than that of polished stainless steel (3A 20-27). The excellent dimensional stability of GYLON BIO-ECO® PLUS ensures best sealing performance without any expansion and intrusion of the sealing material throughout all stages of the process. GYLON BIO-ECO® PLUS is in full compliance with all industry-relevant certificates.

Making sure that the sealing solution met all application requirements, Garlock has customized a sealing solution based on the geometry of the actual flanges. The final design parameters were chosen based on the hygienic sealing performance and the perfect fit of the seal.

GYLON BIO-ECO® PLUS (GYLON® Style 3522) from Garlock has passed all testing within the official EHEDG certification process making sure that the customer was able to move forward in receiving the EHEDG certification for their new hygienic pump model.

For more information, please visit: [www.garlock.com](http://www.garlock.com)

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