Correct diaphragm choice vital for pharma and biotech

Everyone manufacturing business, particularly those with such demanding environments as pharma and biotech, relies on the most efficient production processes possible. The lower the downtime, the more productive and profitable those processes can be.

Production process
This pump diaphragm is highly significant in the production process as it has to be matched to the liquid being transferred to ensure the pumping process is efficient and contamination free. If a fluid becomes trapped, it can stagnate. This can lead to the product becoming contaminated and the batch having to be destroyed, again with major implications for time and revenue.

As a result, all pumping media must be able to comply with steam in place (SIP) and clean in place (CIP) procedures. Consideration must be given to the characteristics of the materials being pumped, their immediate environment and the surfaces they will come into contact with. The surface of the diaphragms in use is a critical component. Cross-contamination and vapour leakage can be avoided by using high-quality polytetrafluoroethylene (PTFE) diaphragms.

Saint-Gobain has been developing its Chemfilm Flex Barrier products to meet the stringent standards pharma and biotech manufacturers have come to expect. These high performance barrier layers for diaphragms and valves are ideal in a pumping process as they have high purity and are engineered with the finest quality virgin PTFE resins.

Chemical resistance
A Flex Barrier used within a diaphragm pump design offers almost universal chemical resistance, even to extremely aggressive chemical media such as aromatic or chlorinated hydrocarbons, acids, caustics, ketones and acetates. It provides low permeability, high smoothness, a low friction coefficient, and extremely low moisture absorption characteristics of c. 0.04%.

It is resistant to the breakdown of its surface even over extended periods of operation therefore extending diaphragm life. Chemfilm Flex Barriers offer a fracture strain of at least 216% (min. values) and a tensile modulus of c. 532 N/mm² (60,000 psi) with a tensile strength range from min. values of c. 43 N/mm² (6,200 psi).

Also, pumps and their diaphragm components must perform over the long-term at high temperatures. Virgin PTFE can operate continuously at temperatures of 180°C (356°F) or in cycropgenic applications down to -25°C (-13°F) with little or no loss of mechanical function for up to 10,000 service hours. Chemfilm Flex Barriers are also certified with a typical melt temperature of 137°C (279°F).

Increased lifespan
Taking all this into consideration, Chemfilm FR Flex Barrier films had approximately a 76% increased lifespan compared to alternative premium PTFE films in Saint-Gobain’s internal high-frequency flex tests to simulate diaphragm material flex life performance.

The Saint-Gobain portfolio of Flex Barriers
• Stand-alone diaphragm components
• Suitable for bonding to rubber diaphragm components

Saint-Gobain can provide a solution no matter what the pumping environment or process may be in a particular industry. Its Chemfilm Flex Barrier films are protection materials for diaphragms, engineered to meet not only current requirements but those that may occur in future.

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