

In the manufacture of titanium dioxide pigment...

Viton® Provides Highest Reliability in Contact with Gaseous Chlorine, Acids and Abrasive Slurries

Flexible expansion joints in critical process streams resist attack from chemicals, heat and mechanical abuse. Viton assures a long, maintenance-free service life.

Producing titanium dioxide (TiO₂) — the brilliant white pigment used in paint, paper and a host of other products — brings new meaning to the word extreme. Extracting the pigmentary material from raw titanium ore involves a series of rigorous chemical and mechanical operations that demand top performance from equipment, materials and operating personnel.

Hot gaseous chemicals, abrasive slurries and acidic solutions are just a few of the villains in the chlorination process that converts ore to refined product. And, because chlorine and other hazardous and corrosive chemicals are involved, operations must be conducted under the strictest safety requirements with no margin for error.

DuPont, the world's largest producer of quality TiO₂, is continually seeking ways to make its manufacturing operations safer and more reliable. According to the company's engineering and maintenance personnel, an important contributor to improved reliability has been a family of flexible elastomeric expansion joints used at critical connections in piping and equipment.

Manufactured for DuPont by Mercer Rubber Company in Hauppauge, N.Y., these motion-absorbing joints can be made from any of several different elastomers, depending on end-use requirements. Where operating environments are especially severe, DuPont has adopted a premium-quality joint made of heat- and fluid-resistant DuPont Dow Viton® reinforced with high-strength Kevlar® aramid yarn.

Success with Viton in Highly Corrosive Service

DuPont's TiO₂ plant in Edgemoor, Del., a long-time user of the basic Mercer expansion joint design, was the first to benefit from the premium-performance version made of Viton. At this open-air manufacturing facility, more than 200 Mercer expansion joints made from Neoprene, Nordel® and other elastomers have been put in service during the past quarter century. According to plant maintenance records, these joints have given outstanding service on process lines and at suction and discharge ports on pumps and blowers in all areas of the manufacturing operation.



When a process change at the Edge Moor plant put increased performance demands on much of the plant's equipment, Mercer set out to develop a joint that would provide superior resistance to chemical, mechanical and thermal abuse. To withstand the more corrosive media and higher temperatures of the changed process, Mercer specified the use of Viton as the elastomer component in the improved design.

To further upgrade the new expansion joint, Mercer replaced the polyester reinforcing yarn with Kevlar aramid, DuPont's super-tough fiber famous for its use in bulletproof vests. A bias-ply angle construction was adopted to optimize the longitudinal and radial strength needed to withstand extremes of movement and pressure. And, a special latex adhesive coating was applied to the yarn to assure integrity of the fiber/elastomer bond.

In all, 20 of the new joints made of Viton and Kevlar were installed on pumps and blowers involved in Edge Moor's process change. Most of the joints were placed

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in areas where process conditions were especially severe. In every one of these applications, Viton® has provided reliable service with corrosive chemicals at process temperatures as high as 302°F (150°C) and pressures up to 80 psi. What's more, many of the joints were installed outdoors where they have been exposed to sunlight, ozone and ultraviolet. Yet despite the severity of these applications, *all 20 of the original joints made of Viton are still in service.* Maintenance records indicate that not a single replacement has been needed in the six years since they were installed.



Custom Engineering, Quality Materials Are Keys to Success

Mercer Rubber Company, a leading manufacturer of engineered rubber products, stocks a full line of piping and ductwork expansion joints made from DuPont Dow elastomers, including certified Viton, Nordel®, Hypalon® and Neoprene, as well as other specialty polymers. Sizes range from ½" to 144" with pressure ratings up to 350 psi. For special applications, custom units are developed, including rounds, squares, rectangles, offset connectors, tees and special flanges. Selection of elastomer and fabric reinforcing yarn is based on the performance requirements at each application.

"Developing expansion joints to meet the special requirements of DuPont's TiO₂ process required excellence in engineering design, material selection and manufacturing skill," said Lloyd Aanonsen, general manager of Mercer Rubber. "We offer that same level of excellence worldwide to industrial companies that want to improve the performance and reliability of their process piping systems."

According to Aanonsen, Mercer's expansion joints are used widely throughout the chemical; pulp and paper; and mineral processing industries, as well as in power generation systems and water/wastewater treatment facilities.

For more information on Viton and other elastomers:

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