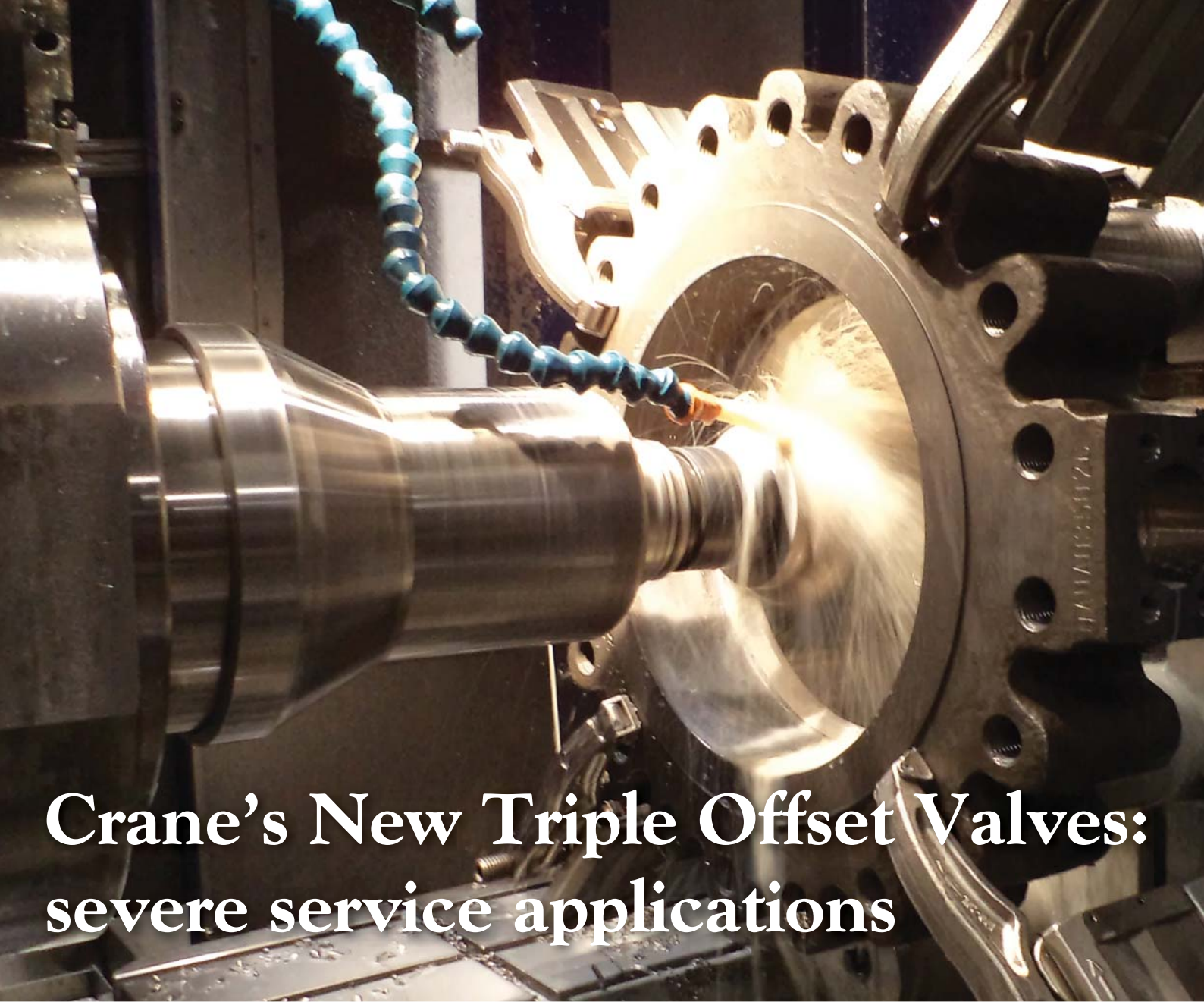


Crane's New Triple Offset Valves: severe service applications

Since its foundation in 1855, Crane's goal has been to achieve manufacturing excellence. Crane ChemPharma & Energy, within Crane's Fluid Handling segment, is proud to be a part of that illustrious history, delivering solutions to the fluid handling challenges faced by the industry's most demanding applications. One recent innovation which deserves special attention is the company's range of triple offset valves (TOVs), which continue to shine in a variety of severe service applications.

By Sarah Bradley

It is no secret to say that process industries around the globe are looking to improve efficiency. The challenge comes in finding the right engineered products that can help them raise output. It was exactly this topic that Crane's managers wanted to discuss when talking to Valve World for this month's cover story. In fact, immediately on arrival Juergen Sonderschaefer (VP Global Sales – Crane CP&E) kick-started our discussions as follows: "as they continuously strive to increase efficiencies and maximize operational performance, power plants, chemical companies, oil and gas processers and manufacturers worldwide rely on valves to effectively function in harsh applications. Volatile cyclic conditions, abrasive media, hazardous chemicals and the threat of fugitive emissions have intensified the stress and expectations placed upon process equipment, especially when it comes to valves."

In combined-cycle power plants, he said, gas turbine starts, thermal transients and gas turbine acceleration have become increasingly severe, forcing process equipment to accommodate higher flows at increased temperatures. "Similarly challenged are coal-fired power plants, where efficiency is the direct result of steam temperature and pressure. In chemical plants, thermal cycles and corrosive media create challenging conditions for fluid handling. Overall, increasingly strict governmental regulations and greater production demands have compelled valve users in all industries to seek solutions that are as efficient as they are effective," he noted. To keep pace with these trends, valve manufacturers such as Crane must deliver solutions that are versatile, cost-effective and able to provide the next generation of sealing performance, emphasized Randhir Shetty (Regional Business Line Manager).

ideal for

"Lightweight, compact and operative in a variety of applications, butterfly valves could become the epicenter of development as an effective alternative to other valve types. That's why we are keen to explain how triple-offset butterfly valves can meet the demands of the aforementioned industries and how a next-generation design can now provide superior solutions in various applications."

Triple-offset butterfly valves

A valuable solution in severe conditions, triple offset butterfly valves (TOVs) are already utilized in myriad industries, including oil and gas processing, refining, hydrocarbons storage and transport, chemical and petrochemical plants, power generation, offshore platforms, district heating, pulp and paper, steel mills, sugar mills, desalination, and water treatment & distribution, to name but a few, noted Ralf Becker (Business Line Manager).

"These applications require operational efficiency, resistance to abrasive media and chemicals, and versatility within a wide range of operating conditions. Likewise, high-temperature and high-pressure environments require valves that can withstand extreme conditions. Specially designed to shut off in high-temperature service where other resilient-seated valves are not well suited, triple-offset butterfly valves offer a compact, cost efficient alternative to other valve types," he said.

As the name implies, three separate offsets are designed into the valve. Two of the offsets apply to the location of the shaft with respect to the center line of the bore and the center line of the disc/seat sealing surfaces. The third offset in the design is the axis of the seat cone angle that is inclined from the center line of the valve bore to minimize rubbing of the seat/seal contact surfaces during operation, and to preserve sealing integrity over the cycle life of the valve. According to Jörg Massow (Crane Engineering Department), this unique design can accommodate the temperature extremes present in harsh applications.

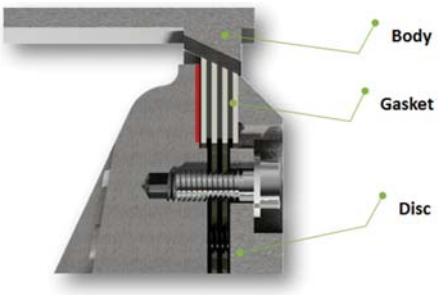
Mr. Massow stated that: "triple-offset butterfly valves offer the best sealing and longest life of all butterfly valve designs. With innovative self-centering, flexible seal ring and optimal torque transmission, these valves offer fire safe designs and the flexibility to create customized solutions."

Mr. Detlev Ammon (VPGM – Crane Krombach) fully concurred. "The benefits offered by our Crane® FKX 9000 triple-offset butterfly valves make them ideal for inclusion in numerous applications. The triple offset design provides bi-directional zero leakage shut-off in high-pressure, high-temperature applications, through a precision machined metal-to-metal sealing design. The seal life is enhanced by a wide seal-ring gasket that provides even compression of the seal ring and a consistent sealing performance, while our bearing design fully supports the shaft and prevents shaft deflection and seal leakage."

"In addition, the quarter-turn design offered by a triple-offset butterfly valve is easy to install, automate and operate, while providing a reliable and cost-effective means of flow control and isolation that performs well with minimal torque," added Mr. Ammon.

Longer seal life

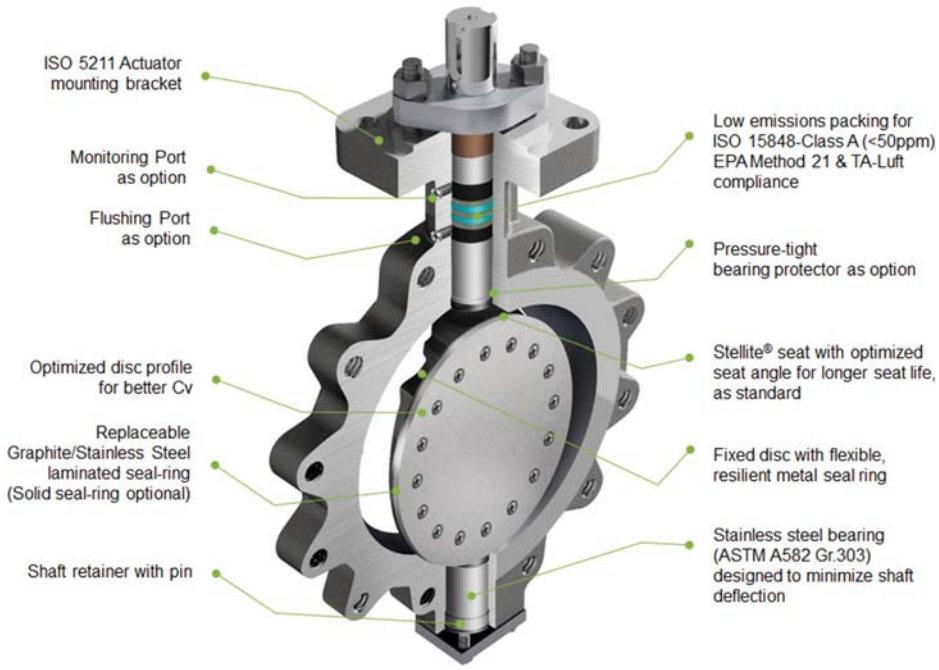
While triple-offset butterfly valve designs have traditionally offered effective solutions to the industry's challenges, Crane's new triple offset valve further enhances the level of performance available to our End Users worldwide, stated Mr. Sonderschaefer. "The next-generation Crane® FKX 9000 is an excellent option for challenging environments, including high-temperature applications, hydrocarbon service, and emergency shutdown service. In high-temperature steam applications, the metal-to metal-seat expertly handles thermal fluctuations. For hydrocarbon service, the valve also meets the requirement for 'fire-safe' applications, as per API 607, 6TH edition. Additionally, as quarter-turn valves, TOVs are an excellent choice to quickly shut off sections of a plant's process or pipeline in



emergency situations such as fire, making them the ESD valve of choice in tank farms, etc," he said.

This next-generation cast TOV offers users a best-in-class in-line seal design and a world-leading fugitive emissions package, added Mr. Shetty. "Additional features such as a graphite-free seal ring and pressure tight bearing protection enhance service in severe or abrasive applications. Capitalizing on previous TOV design features to create a superior valve, the next generation valve offers an array of features that further enhance valve safety and performance."

Asked about more enhanced features, Mr. Becker pointed to the optimized seat angle whose innovative design and Stellite® hard-faced valve body seat deliver a longer seal life and improved abrasion resistance, even after extensive cycling. "Designed to eliminate wedging or binding of the disc, and lower the operating torque, the new valve can reduce total cost of ownership by up to 50%," he said. "Additionally, a precision machined metal seat and seal ring deliver reliable and bi-directional shutoff in high-temperature, high-pressure and severe service applications among others. The right-angle conical design facilitates frictionless in-line sealing."



Jorg Massow & Ralf Becker, showcase Crane® FKX 9000 – the next gen TOV

Affordable solution

Although many valve types are effective in controlling fugitive emissions, the compact design of TOVs makes them a lucrative alternative to traditionally higher-cost valve selections, according to Mr. Ammon. "In this regard, the next-generation TOV is a particularly effective option due to an innovative stem seal design that delivers superior fugitive emissions control (ISO 15848, Class A) under recurrent and extreme thermal cycling, and reduces potential down time."

"Unlike position-seated ball, butterfly or plug valves, the new torque-seated TOV self-adjusts to evenly distribute seal compression, while a 'floating' seal ring and wide gasket yield a better seal that eliminates binding and enhances performance," said Mr. Massow. He also touched on the optimal positioning of the pin connector, located in the lower portion of the disk, which, he said, enables the next-generation TOV to deliver superior performance. "The bearing design further helps prevent shaft deflection and permits longer valve life," he noted.

A triple eccentric or triple offset butterfly valve is an ideal solution when the application requires zero leakage shut-off but does not allow the use of a soft seated butterfly valve due to low/high temperatures and high pressure, according to Mr. Ammon. "Crane's FKX 9000 Triple Offset Valve design is recommended for industrial applications where large bore valves handle hot steam or isolate parts of their plants and have high/low temperatures that prevent the use of rubber lining elements.

Manufactured in Europe

The Crane®FKX 9000 product line is manufactured at the following Crane factories:

Crane's manufacturing plant in Kreuztal, Germany is best known for its unique ability to manufacture large quarter turn valves including fabricated butterfly valves, triple offset valves, and check valves that range in size from 3" to 136". In addition, Krombach offers a line of soft seated and metal seated ball valves that are manufactured with precision to address the requirements of rugged service conditions in corrosive, abrasive, high-temperature applications.

Founded in 1980, the manufacturing plant in Muta, Slovenia, has been a part of the Crane family since November 2000 and comes from a 400-year-old tradition of steel production and processing. The superior build quality of the Crane TOV is assured by the ISO 9001:2000 certification and customized to customer requirements in accordance international standards. Manufacturing capabilities include state of the art plasma welding, and CNC machining.

Compared to ball valves, the Crane® FKX 9000 Triple Offset Valve is an affordable solution that requires less structural support to ensure bubble tight shut-off."
He continued: "the result is a virtual zero leak rate even in high-pressure, high temperature applications. Due to their quarter-turn movement for opening and closing, the valves are easy to automate and they can fulfill a quick closing time, which is often required in safety applications."
As the chemical and energy sectors continue to evolve and producers seek cost-effective ways to maximize efficiency without sacrificing innovation, triple-offset butterfly valves offer a practical and effective solution, concluded Mr. Sonderschaefer. "Emergent trends such as increasing temperatures and pressures and stricter fugitive emissions regulations require valves that are able to perform under severe conditions while maintaining strict control of unwanted emissions. In these volatile applications, a new triple-offset butterfly valve is able to deliver the versatile, highly-engineered solution that the changing landscape requires."

Capabilities

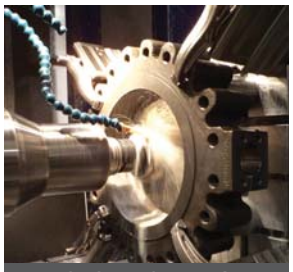
Traceability: A stainless steel tag is attached to all manufactured and modified valves. It includes standard ASME information.
Fully tested: All valves manufactured by Crane are tested in accordance with Crane strict manufacturing procedures and industry regulations.


FACTORY IN MUTA, SL


FACTORY IN KREUZTAL, DE

About Crane

Since its foundation in 1855, Crane has been a symbol of manufacturing excellence, expanding alongside the global industrial revolution and shaping the growth of industry worldwide. Crane ChemPharma & Energy, within Crane's Fluid Handling segment, is proud to be a part of the company's illustrious history, delivering solutions to the fluid handling challenges faced by the industry's most demanding applications.
From the industrial revolution to the modern age, Crane has anticipated the challenges of the market and developed progressive solutions to address them. A comprehensive product portfolio backed by a robust global infrastructure enables Crane to deliver localized solutions to the chemical processing, biotechnology, pharmaceutical, oil & gas, refining, and power generation industries worldwide.
Crane's highly-engineered offering includes check valves, sleeved plug valves, lined valves, process ball valves, high-performance butterfly valves, bellows sealed globe valves, aseptic and industrial diaphragm valves, multi/quarter-turn valves, actuation, sight glasses, lined pipe, fittings and hoses, and air operated diaphragm and peristaltic pumps.
With offices, manufacturing plants, distribution networks, and sales & service centers that span the globe, Crane CP&E is a worldwide leader in fluid handling products and solutions.


CNC MACHINING


PLASMA WELDING


TESTING

Field repair services: Crane technicians are available for field repair and emergency service at customer sites.
Consistent quality: The high Crane quality is supported by the company's extensive practical experience, state-of-the-art manufacturing, and quality assurance certified by international inspections authorities. For more information please visit the company website: www.cranecpe.com

Triple offset valves – the key benefits

According to the Crane managers Valve World spoke to, TOVs are effective for the following reasons:

- For the harsh conditions of critical process applications, steam isolation, and temperature extremes, TOVs provide unmatched performance, reliability, and quality
- Precision-machined sealing components and innovative design geometry provide improved cycle life, lower operating torque, and reliable performance in extreme temperatures
- The bi-directional zero-leakage closure with a metal seat, even after extensive cycling, provides sealing integrity formerly associated only with soft-seated valves
- TOVs are lighter weight and lower cost than alternative designs. Their compact design facilitates installation and requires less bracing of piping
- Low torque enables TOVs to be automated with simple, low-cost, quarter turn actuation
- TOVs are fire-tested – as per API 607, 6th edition
- A single valve delivers exceptional flow control, optimized Cv, and low Delta P
- A replaceable seal ring allows for quick, easy repair