

QUADAX® TOP ENTRY BUTTERFLY VALVES

EASY AND SAFE MAINTEN-
ANCE WORK IN LNG
APPLICATIONS

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LNG is exactly what it says: the liquid form of natural gas. The process of liquefying is performed to reduce the volume for purposes of transporting the fuel: LNG reduces volume by 600 times, making it much more economical to transport. The valves are a critical component at each stage of the liquification process.

Moreover, the friction free metal to metal design allows a maintenance free usability in this application. Thanks to the four offset design and a remarkable precision in manufacturing, the QUADAX® Butterfly valves have provided evidence of an outstanding performance in LNG installations particularly in LNG terminals and storage tanks among other cryogenic applications.

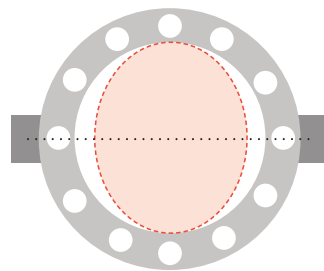
The regulatory requirements EN 1473-2016 for Installation and equipment for liquefied natural gas - Design of onshore installations, is describing the importance of little to no presence of flange connections in LNG pipelines. For security reasons this European standard stipulates in the section Valves among other criteria:

- In-line split body valves are not recommended in cryogenic services.
- Valves to be installed in cryogenic hydrocarbon and toxic systems are recommended to have butt-welded ends.
- Cryogenic and high temperature welded valves shall be designed to enable the maintenance of the internal components without removal of the valve body from the line.

Engineering companies, contractors and finally the end users have an increased interest to comply with the specifications of the regulatory requirements.

Its performance and reliability are crucial for the whole process. The four offset construction of the QUADAX® butterfly valve, produced on modern 5 axis machining centres in Germany, acts with a totally round seat and sealing geometry. This construction allows to handle reliably extreme temperatures like below -250°C (-418°F).

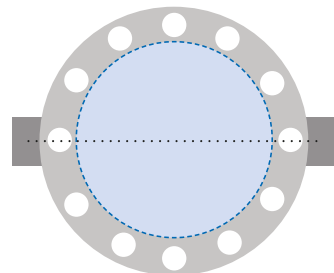
Even if material is shrinking and expanding due to extreme temperature differences, the valve keeps its 100% tightness.



Conventional triple Offset Butterfly Valves

- Wear due to friction
- Few leaks
- Maintenance prone

A conventional triple offset valve acts with an elliptical seat and sealing geometry.



Four Offset QUADAX® Butterfly Valves

- Friction free
- Higher KV/CV values
- Highest tightness/No Leaks (even in the most extreme conditions)

The 4 offset butterfly valve offers a totally round seat and sealing geometry.



In order to achieve this requirement there are two solutions available on the market:

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Side entry butt weld design

Side entry valve features an access on the body on one side of the trim which should enable the service person to remove the seat and to uninstall the seal ring. A weak point is, that the trim cannot be extracted and therefore, the maintenance must be executed by keeping the disc in to the pipe. For valves with high operation cycles in example, the shaft bearings cannot be replaced without removing the body from the pipeline. Furthermore, for sizes below DN 300, 12", it is very

difficult to access and replace internal components due to lack of space for a proper handling. On the other hand, for large sizes and high-pressure classes a service person is required to enter the line to replace sealing components with a risk of direct exposure to residual gas. Extra ordinary safety measures are requested. An erroneous pressurisation of the pipe or strokes of the valve during maintenance work could have fatal consequences.



Top entry Design

QUADAX® decided since the beginning of LNG applications to design their valve bodies as top entry design for this purpose. Although, the Butterfly valves for clean liquid, gaseous cryogenic applications are basically maintenance free, extraordinary repairs could be necessary for any reasons. In this case the central top flange can be removed and the internal components can be easily extracted from the body. An efficient replacement of all parts including shaft bearings are possible in a safe environ

ment with free access for the service personnel regardless of the valve size. Thus, nobody is exposed to any further risks and the maintenance work requires less time. Furthermore, the body length is shorter than the one of side entry design which results in less weight and less mechanical stress on the body by isometric differences in the pipework.



Conclusion

Thanks to the four offset construction and state of the art manufacturing technology, QUADAX® valves offer 100% compliance even with the highest tightness or temperature requirements. QUADAX® Top Entry Butterfly valves

fully satisfy the requirements of the EN 1473-2016 specifications for valves providing full tightness also for clean liquid, gaseous cryogenic applications with extreme temperature differences.

The butt weld version QUADAX® TOP ENTRY is specifically designed for LNG applications where control & maintenance work can be performed safe and easily in the installed position without further risks for the service personnel.

For more information, please contact