

CHALLENGES FOR BUTTERFLY VALVES IN SOLAR THERMAL SYSTEMS

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The four offset butterfly valve from the manufacturer **QUADAX®** is used worldwide in solar thermal systems and offers important advantages in terms of reliability and cost efficiency.

The number of solar power systems is increasing worldwide: Back in the mid-eighties, when the first solar plants went into operation in the Californian desert, they had a capacity of just 350 MW. However, thanks to technical innovations, solar systems now achieve a capacity of 3,000 MW. The process of transferring stored solar energy to carrier media places high demands on the material and on the design of all the components within the system. In pipelines, butterfly valves regulate the flow of fluids. What are the requirements for these butterfly valves and what are the significant advantages of **QUADAX®** valves?

Solar thermal systems bundle and reflect the sunlight using mirrors until the heat transfer medium is made to circulate. Thermal energy is transferred to vacuum-insulated pipelines and the absorbed solar energy is transferred via heat exchangers to, among other places, conventional steam power plants that drive a gene-

erator. The cost and efficiency of solar thermal systems depend on the carrier medium used. The use of HTF (Heat Transfer Fluids) or molten salt offers the advantage over water that high pressures and pipes with large nominal diameters are avoided. The use of HTF or molten salt, however, causes very high temperatures and aggressive conditions in the system. For this reason, an absolutely tight valve made of special materials, meeting the highest tightness requirements and with a particularly compact design is required. This is where the innovative **QUADAX®** butterfly valves come in!

HTF is a composition of various aromatic hydrocarbons made of benzene, which is able to store the heat energy optimally. A disadvantage is the high toxicity and aggressiveness of the oil, which lead to wear in the pipes. The **QUADAX®** butterfly valves used are therefore made of special materials and are equipped with an innovative graphite-free sealing system. Also, at temperatures of +400°C and above, leaks can occur causing environmental damage. Molten salt as a carrier medium is a more environmentally friendly and cost-effective that can be used at temperatures up to +500 °C.

However, molten salt particles require sophisticated valve designs to avoid deposits.

QUADAX®'s innovative four offset butterfly valve with its special feature – circular sealing geometry with identical material thickness all around – ensures uniform contraction and expansion of the seal, especially when subject to extreme pressure and temperature fluctuations. Butterfly valves are absolutely leakage-free. Higher Kv values (water flow in m³/h) and the reduced weight of the valves allow reduced costs. The durability of the valves ensures low maintenance costs.

Many years of experience in the field of solar thermal systems make **QUADAX®** the proven manufacturer for the highest sealing requirements with 100% efficiency. The **QUADAX®** valves are designed to be reliable, durable and highly cost-efficient, and enjoy an excellent reputation worldwide.

QUADAX® is part of the müller co-ax group, a family-owned company with 60 years of experience in valve technology, which produces exclusively in Germany in order to meet the highest quality demands.