

## Application description:

### Special slide gate valve made of Zirconium

- **Advantages:** Corrosion resistance in hydrochloric acid atmospheres and under pressure and vacuum

### Application context

The Kammerer slide gate valve is installed in a demanding reactor environment. The plant processes both liquid and solid materials under conditions that are sometimes chemically aggressive and in an atmosphere containing hydrochloric acid. The existing reactors must be leak-proof against backflowing vapors and sudden increases in pressure and temperature. Regular separation processes take place at intervals of 4 to 24 hours. These require materials with maximum chemical resistance, mechanical stability, and tightness.

### Kammerer solution: Zirconium slide gate valve

- Type: Slide gate valve DN 200 FTII
- Material: Flange, slide valve blade, and contact ring made of zirconium, sealing surface corrosion-resistant

### Task

The slide gate valve is located above a reactor and performs the following tasks:

- Blocking of vapors that hit the sliding knife from below
- Tightness under changing pressure, vacuum, and temperature conditions
- Protection of upstream processes during the introduction of solid and liquid media
- Consistent corrosion protection against highly aggressive media such as hydrochloric acid

### Challenges

- **Chemical stress:** corrosive media such as hydrochloric acid and vapors place extreme demands on materials and seals
- **Temperature, pressure, and vacuum changes, resulting in mechanical stress:** Reliable operation of the gate valve despite changing temperatures (150°C) and pressures (3.5 bar) as well as vacuum (50 mbar abs); the gate valve blade must remain mechanically robust, break-proof, and tight
- **Cyclic operation:** Opening and closing intervals in the range of 4 to 24 hours require robust and wear-resistant components

### Results

- Trouble-free, long-term operability of the zirconium slide gate valve confirmed
- Stable sealing and closing function under high chemical and thermal stress
- Trouble-free operation despite intensive stress in cyclic operation
- Confirmation of the suitability of zirconium as a material in hydrochloric acid atmospheres and in combination with aggressive solvents

#### *Note:*

*Please note that this application example is a specific individual case. Information on service life extension and maintenance cost reduction is based on the specific operating conditions of the respective system. Conclusions regarding the benefits can vary greatly depending on the medium, temperature, flow situation, and system configuration.*