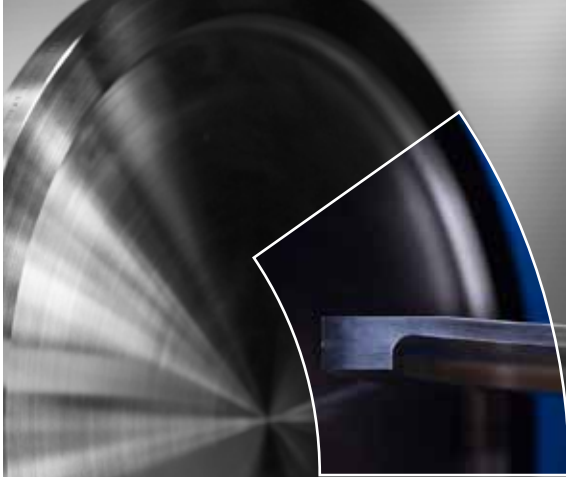


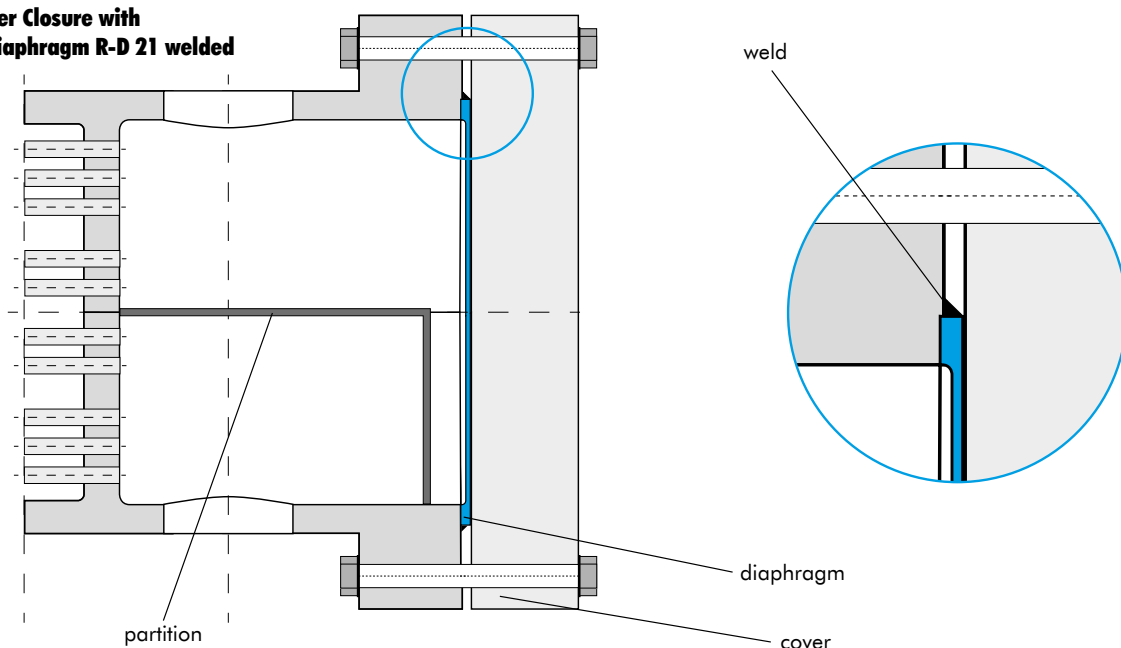
## SOLID METAL GASKETS

### METAL DIAPHRAGMS SPETORING® R-D



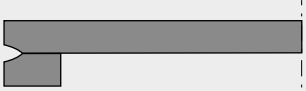
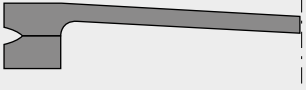
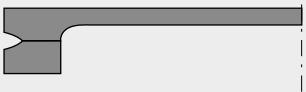
| Designation          | Sketch | Description  |
|----------------------|--------|--|
| SPETORING®<br>R-D 10 |        | <p>A <b>metal diaphragm</b> for welding is a type of seal used for flat covers in exchangers operating at high pressures, in high temperatures, or, simultaneously, with a high level of both of these parameters. They are also used for the hazardous media, e.g. in hydrogen installations.</p> <p>They are made of a thin plate of stainless steel or of special alloys. The plate is usually welded circumferentially with an inguinal seam or butt welded onto the chamber flange or onto the chamber plater. It is also used as an anticorrosive shield. One of the advantages of using the <b>welded diaphragm</b> is reduction of the requirements related to screws because the seal (the welded diaphragm) forms tension at the zero level.</p> <p>Regardless of the circumferential weld, the <b>diaphragm</b> is pressed by the lid onto its outer side, like in the flange-screw connection; which results in different peripheral part geometries.</p> <p>On occasions, in order to reduce the welding stress as well as to reduce the pressure resulting from pressure- and temperature load in motion conditions, in the chamber flange there are special malleable rings, which improve the elasticity of the connection between the <b>diaphragm</b> and the chamber flange.</p> <p><b>Spheric diaphragms</b> are used for shell and tube heat exchangers' chamber locks. Thanks to their special profile, they have certain elasticity, which reduces the stress generated by either welding or by exposure to pressure and temperature. Their sphericity is closely matched to the motion conditions and ensures consistent moves of its peripheral part as well as that of the internal part of the shell.</p> |
| R-D 11               |        |  |
| R-D 13               |        |  |
| R-D 14               |        |  |
| R-D 16               |        |  |
| R-D 18               |        |  |
| R-D 21               |        |  |

**Flat Cover Closure with  
Metal Diaphragm R-D 21 welded**

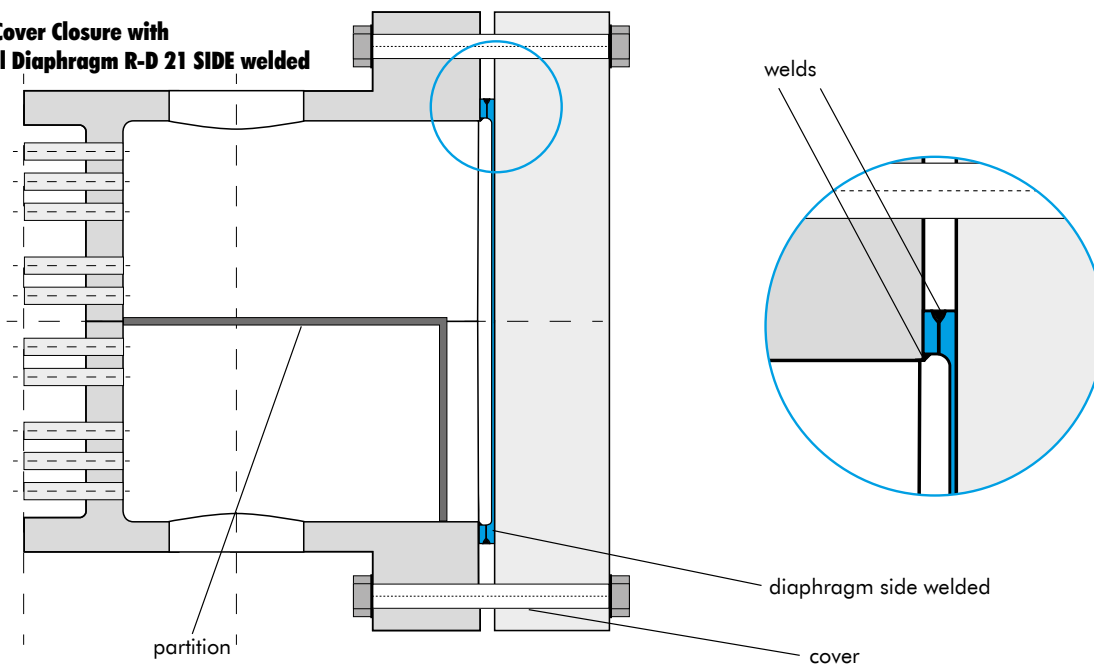


## SOLID METAL GASKETS

### METAL DIAPHRAGMS SPETORING® R-D



| Designation               | Sketch  | Description  |
|---------------------------|---|--|
| SPETORING®<br>R-D 10 SIDE |  | <b>Metal Diaphragms</b> which are predesigned to be installed by welding to the flange might be also equipped by additional adaptor ring. When delivered together with adaptor ring diaphragms are given special ' <b>-SIDE</b> ' designation accordingly.   |
| R-D 18 SIDE               |  | During installation of <b>-SIDE</b> metal diaphragms:<br>– firstly the adaptor ring is welded to flange (from inside and from outside) and<br>– secondly the diaphragm closure is connected to adaptor ring by 'main weld' by ' <b>SIDE</b> ' weld.  |
| R-D 21 SIDE               |  | 'Main Weld' is not made in such construction to the flange – this fact may facilitate cutting it off when vessel opening is necessary for maintenance purpose.<br>Below you can find key facts about usage of adaptor :<br>– provide 'side' access to 'main weld' during installation and dismantling,<br>– facilitate reusing of diaphragm (especially important when often open – close operations necessary),<br>– reduce cost of re-install as no flange refurbishment is necessary (after the main weld cut off). |

**Flat Cover Closure with  
Metal Diaphragm R-D 21 SIDE welded**



# SOLID METAL GASKETS

## METAL DIAPHRAGMS SPETORING® R-D

| Designation          | Sketch  | Description   |
|----------------------|---|---|
| SPETORING®<br>R-D 30 |  | A separate group of <b>diaphragms</b> are those used for heat exchanger chamber locks, HH and HL, where in the tubular space, there is high pressure and in place of the flanged connection, the breech-lock is being used the main advantage of using this lock is much smaller size and weight, comparing to the conventional screw-mounted lid. The main element of the <b>breech-lock</b> is the <b>diaphragm</b> fitted with a peripheral seal through the pressure-blocking rings system. In some cases, the <b>diaphragm</b> can be equipped with a central gap, if a revisory gap is provided in the lid. The advantage of this approach is avoidance of the need to cut the weld during inspections. |
| R-D 32               |  |   |

### Breech Lock (Screw Plug) Closure with Metal Diaphragm R-D 30 installed

