SPHERICAL SHELL PLATES

Fit-to-assembly segments comprising a spherical tank. (Inside diameter 22.500 mm x 95 mm, steel grade SA 537 class 2)
Spherical shell-plates are tailor-made segments („petals“) manufactured ready to install spherical storage vessels where the emphasis is placed on the high dimensional accuracy of the individual segments.

**Manufacturing process**

Taking into account the material properties, the plate thickness and the required radius, either cold or hot forming can be used. In both alternatives, the shaping process is conducted in a „safe“ way so that the steel mechanicals remain preserved. The segments for spheres above 7,000 mm in diameter are normally manufactured cold by progressive dishing. Once the segments are shaped properly, the weld-edges are subsequently engineered by flame cutting.

**Scope of supply**

Unless otherwise required, the arrangement and the sizes of the segments are optimised by considering the available shop facilities, the transport conditions and the field erection constraints. Depending on the material and on the forming radius, the „petals“ are fabricated in thickness of up to 110 mm in width, of up to 4,000 mm and in length of up to 12,000 mm: the final piece weight is generally restricted at 23 t. The scope of supply includes also „petals“ fabricated from material produced by thermo-mechanical controlled process (TMCP) or by water-quenching process (QT). An extensive experience allows manufacturing the segments ready for assembly without any shop trial fit-up.

Please refer also to the Technical Delivery Conditions on page 32.
Dimensional program
Format of largest workable segment in relation to inside diameter and wall thickness

1) The dimensions (length and width) are given by arc measure. The data on wall thickness apply to steel with 355 N/mm² yield strength.
**Standard tolerances**

<table>
<thead>
<tr>
<th>Edge design</th>
<th>Bevel angle</th>
<th>± 2°</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land height</td>
<td>± 2 mm</td>
</tr>
<tr>
<td></td>
<td>Land position¹</td>
<td>± 2 mm</td>
</tr>
<tr>
<td></td>
<td>Cut-face quality</td>
<td>ISO 9013-33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Arc length</th>
<th>± 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arc width</td>
<td>± 2 mm</td>
</tr>
<tr>
<td></td>
<td>Diagonal difference</td>
<td>≤ 3 mm</td>
</tr>
</tbody>
</table>

| Shape¹²              | 200 mm wide edge area ¹   | ≤ 2 mm/1,000 mm |
|                      | away from edge area      | ≤ 6 mm/2,000 mm |

---

The shape deviation is measured as distance A between a template with a chord length of 1,000 mm respectively 2,000 mm and the spherical segment laying down on a measuring bed set to the nominal radius.

¹) related to the internal surface
²) measuring position: along the plate edge

(R_i = inside radius)

---

**Information required**

- Inside diameter D_i
- Arrangement of segments
- Minimum wall thickness(es) after forming s
- Fabrication code

---

Spherical shell plates are always outlined by longitudinal or latitudinal arcs, either by "great circles" (with circle centre in sphere centre) or by "small circles" (with circle centre outside the sphere centre).

All dimensions are given by arc measure related to the inner surface.

Unless otherwise agreed, allowance for assembly root-gap or for welding shrinkage will not be taken into consideration.