

## General tolerances for vessels

General-purpose vessels

**DIN**  
**28 005**  
 Part 1

Allgemeintoleranzen für Behälter; Behälter allgemein

Supersedes December  
1975 edition.

*In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.*

Dimensions in mm

**1 Field of application**

This standard specifies general tolerances for non-enamelled metal vessels such as are widely used in process engineering applications. DIN 28 006 Part 1 specifies general tolerances for vessels fitted with an agitator, DIN 28 007 Part 1, general tolerances for columns, and DIN 28 008, for heat exchangers. The general tolerances specified in the present standard only apply where reference is made to it on drawings or associated documents (e.g. on technical delivery conditions) in the form described in clause 2 below. Drawings are incomplete if they do not include a reference to a general tolerances standard, even where the dimensions indicated on them are not toleranced (this specification does not apply to drawings indicating auxiliary dimensions, only).

The general tolerances specified here can be maintained using normal workshop equipment and techniques. By agreement, individual selection may be made of the general tolerances that are to apply. Pressure vessels are also required to comply with the specifications of the HP series of the *AD-Merkblätter*.

**2 Designation and indications on drawings**

For non-enamelled vessels (S) required to maintain the general tolerances specified in this standard, the following designation shall be indicated on orders and drawings:

General tolerances DIN 28 005 — S

**3 General tolerances for vessels**

Vessels are not expected to conform to the designs illustrated here; compliance is only required in the case of the general tolerances specified or agreed.

Linear dimensions given in this standard refer to generating lines, and angular deviations refer to the centre line of the vessel in elevation and plan. Dimensions of nozzles are specified with reference to the top of the flange face.

For standardized semi-finished products, such as tubes and flanges, the limit deviations and tolerances specified in the relevant semi-finished product standards shall apply.

For dimensions not individually toleranced in this standard, accuracy grade D as specified in DIN 8570 shall apply as the general tolerance.

Where measurements are to be made to check maintenance of the tolerances specified in this standard, then these shall be directed at establishing whether the dimensions given in the relevant drawing have been maintained.

Continued on pages 2 to 7

3.1 Saddle-mounted horizontal vessels

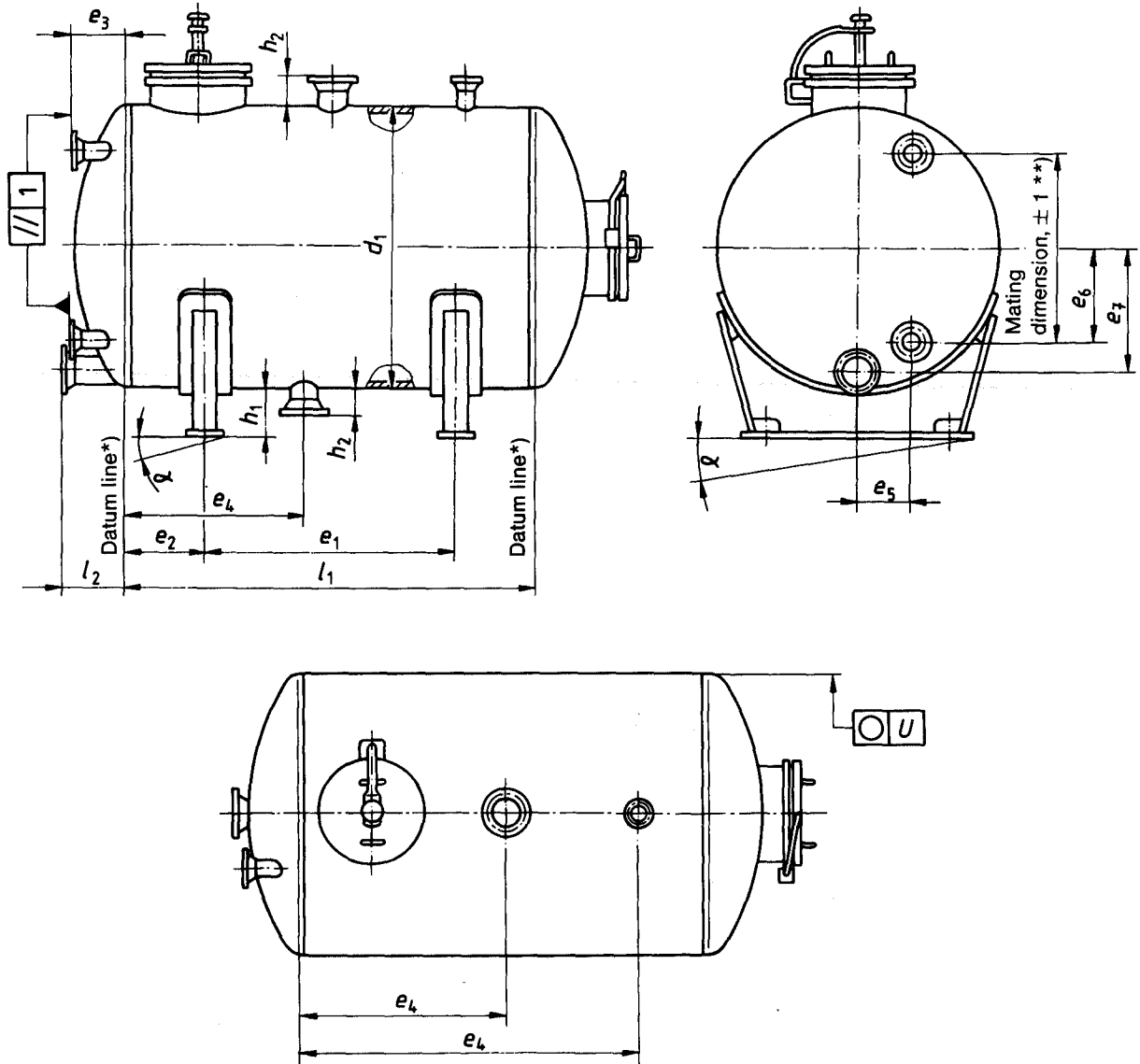


Figure 1.

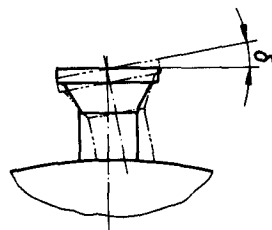


Figure 2.

The illustration applies analogously to y.

\*) As specified in DIN 28 011 and DIN 28 013 respectively.

\*\*\*) Centre line distance of nozzles for attachment of filling level glass.

Table 1. Limit deviations for saddle-mounted horizontal vessels

Dimension	Term	Limit deviations for a nominal range									
		over 30 up to 120	over 120 up to 400	over 400 up to 1000	over 1000 up to 2000	over 2000 up to 4000	over 4000 up to 8000	over 8000 up to 12 000	over 12 000 up to 16 000	over 16 000 up to 20 000	over 20 000
$d_1$	Outer vessel diameter	As per DIN 28 011 and DIN 28 013.					—	—	—	—	—
$e_1$	Distance between saddle supports (anchorage bolt holes)	± 2	± 2	± 3	± 4	± 6	± 8	± 10	± 12	—	—
$e_2$	Distance from saddle (anchorage bolt hole) to datum line	± 2	± 2	± 3	± 4	—	—	—	—	—	—
$e_3$	Distance between datum line and plane of filling level nozzle faces	± 3	± 4	± 6	—	—	—	—	—	—	—
$e_4$	Distance from nozzle to datum line	± 2	± 2	± 3	± 4	± 6	± 8	± 10	± 12	± 14	± 16
$e_5$	Horizontal distance between centre of filling level nozzle and vertical axis	± 3	± 4	± 6	—	—	—	—	—	—	—
$e_6$	Vertical distance between centre of filling level nozzle and horizontal axis										
$e_7$	Vertical distance of outlet nozzle from horizontal axis										
$h_1$	Saddle height	—	± 4	± 6	± 8	—	—	—	—	—	—
$h_2$	Height of shell nozzle from flange face to shell	± 3	± 4	± 6	—	—	—	—	—	—	—
$l_1$	Vessel length between the datum lines	± 3	± 4	± 6	± 8	± 11	± 14	± 18	± 21	± 24	± 27
$l_2$	Distance of flange face of outlet nozzle from datum line	± 3	± 4	± 6	—	—	—	—	—	—	—

Table 2. Geometrical tolerances for vessels

Dimension	Term	Tolerance for a nominal range							
		up to 250	over 250 up to 400	over 400 up to 750	over 750 up to 1000	over 1000 up to 1400	over 1400 up to 1700	over 1700 up to 2000	over 2000
$C^*)$	Squareness tolerance	0,5	1,5	2	3	4	5	6	8
$U$	Out-of-roundness of vessel shell	As per AD-Merkblatt HP 20, October 1977 edition, subclause 5.2							
$\beta^*)$	Angle at circumference for shell nozzles and attachments, measured from middle of manhole, $d_1/2$ being taken as the reference leg	± 1°		± 45'		± 30'			
$\gamma$	Angular deviation of support surfaces of legs from their nominal position (see figures 1, 3 and 6)	0,5° in any given direction							
$\delta$	Angular deviation of the flange sealing surface from its nominal position (see figure 4)	0,5° in any given direction							
For $\beta^*)$ , see figure 3.									