

Pressure vessel details (dimensions) —

Part 2: Specification for saddle supports for horizontal cylindrical pressure vessels

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Committees responsible for this British Standard

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Air Conditioning and Refrigeration Board (ACRIB)
British Chemical Engineering Contractors' Association
British Compressed Gases Association
British Refrigeration Association
British Valve and Actuator Manufacturers' Association (BVAMA)
Department of Trade and Industry (Standards and Technical Regulations Directorate)
Electricity Association
Energy Industries Council
Engineering Equipment and Materials Users' Association
Health and Safety Executive
LP Gas Association
Lloyd's Register of Shipping
Power Generation Contractors Association (PGCA [BEAMA Ltd.])
Process Plant Association
Safety Assessment Federation Ltd.
The Welding Institute

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Foreword

This part of BS 5276 has been prepared by Technical Committee PVE/1 to cover the dimensions of pressure vessel details. It supersedes BS 5276-2:1983, which is withdrawn. This new edition of BS 5276-2 incorporates technical changes only. It does not reflect a full review or revision of this standard, which will be undertaken in due course.

BS 5276 is published in the following Parts:

- Part 1: *Specification for davits for branch covers of steel vessels;*
- Part 2: *Specification for saddle supports for horizontal cylindrical pressure vessels;*
- Part 4: *Standardized pressure vessels.*

Part 3 has been withdrawn without being replaced.

This Part provides data for evaluating the maximum permissible loads on shells of vessels, this data being based upon the requirements of PD 5500. Attention is drawn to PD 6497 which indicates the derivation of the basic equations and constants used in PD 5500. Maximum permissible loads for support parts are also specified.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 15 and a back cover.

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1 Scope

This Part of BS 5276 specifies dimensions and materials for saddle supports welded to stationary horizontal vessels with internal diameters between 600 mm and 3 000 mm, conforming to PD 5500 and having ellipsoidal or torispherical dished ends. This British Standard is applicable to saddle supports welded to vessels manufactured from carbon, carbon manganese and austenitic steels having a permissible design stress not exceeding 210 N/mm^2 at 50°C , with corresponding values at higher temperatures.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 21, Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions).

BS 449-2, Use of structural steel in building — Part 2: Metric units.

PD 5500:2003, Specification for unfired fusion welded pressure vessels.

BS EN 10025, Hot rolled products of non-alloy structural steels — Technical delivery conditions.

BS EN 13000 (all parts), Plastics — Polytetrafluoroethylene (PTFE) semi finished products.

3 Materials

3.1 Saddle supports

The materials used for the construction of the supports shall be as follows.

- a) The saddle plate, which is welded to the vessel, shall be made from material in accordance with the same material specification as the material used for the vessel.
- b) Parts of the supports which are not welded to the vessel shall either be made from material in accordance with the same material specification as used for the vessel, or from material of grades 1.0038, 1.0044, 1.0114 or 1.0143 in accordance with BS EN 10025, providing they are suitable at the predicted temperature.

3.2 Anti-friction materials for sliding supports

When polytetrafluoroethylene (PTFE) is specified for sliding supports (see 6.1) it shall conform to BS EN 13000. PTFE shall not be used for applications at temperatures in excess of 200°C .

4 Dimensions

4.1 The dimensions of the supports shall be in accordance with Figure 1 or Figure 2, according to the diameter of the vessel.

4.2 Saddle supports shall fit closely, and the gap at all exposed edges to be welded shall not exceed 2 mm or one-twentieth of the thickness of the attachment at the point of attachment, whichever is the greater.

5 Manufacture

Saddle supports shall normally be welded to the vessel before any post-weld heat treatment, but in exceptional circumstances, the saddle shall be attached following post-weld heat treatment, provided that the saddle plate is continuously welded to the shell before post-weld heat treatment.

NOTE This standard does not specify a procedure for welding the saddle supports to the vessel after post-weld heat treatment and the full procedure, including the welding of the saddle, should be subject to agreement between the manufacturer and the purchaser.

6 Design considerations

6.1 Provision for axial movement

One support shall be fixed and the other shall be restrained laterally but able to move axially to accommodate movement resulting from thermal effects and axial strain.

The sliding support shall be determined from Figure 3 as either the steel-on-steel type (see Figure 4) or of low friction material (see Figure 5).

NOTE It is assumed that the coefficient of friction is 1 for steel-on-steel sliding supports and 0.1 for sliding supports of low friction material. On this basis, the use of the steel-on-steel type is to be limited to those applications where the load on the saddle support falls below the curve on Figure 3 and is also less than $0.1 W_v$ (see Clause 7). In cases where either of these limitations is exceeded, low friction material should be used. The choice of sliding support to be used is further influenced by consideration of the horizontal forces imposed upon the foundations or supporting steelworks.