

Specification for

Carbon steel welded horizontal cylindrical storage tanks

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Chemical Industries Association Ltd
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 Oil Companies Materials Association

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Foreword

This British Standard, which was first published in 1955 under the joint authority of the Mechanical Engineering Industry Standards Committee and the Petroleum Equipment Industry Standards Committee, is intended to provide for tanks of adequate safety and reasonable economy, in a range of sizes to suit the requirements of user industries for the static storage of petroleum and other chemical products vented to atmosphere. Tanks intended for the storage of liquids corrosive to mild steel should be suitably protected.

In this revision, dimensions are based on chosen metric capacities. Dished and flanged ends of only four sizes are used, which are convenient for the manufacture of compartmented tanks; these are based on metric outside diameters. Imperial dimensions for dished ends are retained for current production purposes, but as and when existing tooling requires renewal it should be replaced to suit the metric sizes specified in this standard.

Due to the current low demand, unflanged ends and flanged ends butt-welded to the shell are not included in this revision. However, if justified by demands from industry, consideration will be given to the reinstatement of either or both of these forms of construction at a future date.

Dimensions for lifting lugs are included and certain of the requirements dealing with welding and testing have been revised.

Manhole details are given and manholes are shown positioned near one end of the tank, with the advantages that:

- a) it is easy to avoid a joint weld through the manhole;
- b) some degree of production standardization can be achieved;
- c) tank manlid connections can be grouped at one end, which can be particularly useful in multitank installations.

The above-ground tanks specified in this standard comply with the performance requirements for Type A tanks in BS 799-5.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies requirements for the design and construction of carbon steel fusion welded horizontal cylindrical storage tanks with dished and flanged ends for the storage of liquids. The standard includes both above-ground tanks with saddle supports and underground tanks.

Details of the range of dished and flanged ends upon which the range of standard diameter tank sizes has been based are given in Table 2A and Table 2B.

The overall lengths given in Table 1A and Table 1B relate to tanks with butt-welded circumferential seams. Tanks wholly fabricated at the manufacturer's works may be constructed using either of the types of construction illustrated in Figure 3, provided the overall lengths specified are maintained.

NOTE 1 The above-ground storage tanks specified in this standard are not intended for mobile applications.

NOTE 2 Except where otherwise stated the requirements specified apply to both above-ground and underground tanks.

NOTE 3 Attention is drawn to regulations concerning the storage of flammable liquids. Petroleum spirit must be stored in tanks complying with the requirements of licensing authorities.

2 References

The titles of the British Standards referred to in this standard are listed on the inside back cover.

3 Information to be supplied by the purchaser

The following information, as appropriate, shall be supplied by the purchaser with his enquiry.

- a) The diameter and length or the nominal capacity of the tank.
- b) The shell and end plate thickness required.
- c) The diameter, number and position of any extra manholes required (see 8.3.2).
- d) The material to be used for the manhole and other gaskets (see 8.3.2.6).
- e) Whether the tank is to be wholly fabricated at the manufacturer's works or to be supplied "plate small". For tanks supplied "plate small", the purchaser shall indicate the shell plating arrangement required (see 6.2).
- f) Whether any treatment is required for the removal of mill scale (see 7.1.2).
- g) Dimensioned drawings giving details of the type class and position of any fittings or mountings.
- h) Whether welding procedure drawings are required (see 9.4.2).

i) Whether the test to be carried out shall be particularly hydraulic or pneumatic (see 10.1.1.1).

j) Whether a test certificate is required (see 10.3).

k) Whether the capacity of the tank is to be calibrated (see clause 11).

l) The protection required on internal and external surfaces (see 14.1).

m) Whether the tank has to be specially packed or marked for transit (see 14.2).

n) For above-ground tanks, the relative density of the liquid to be stored.

o) For above-ground tanks, whether or not integral saddle supports are to be supplied.

4 Working conditions

Tanks complying with this standard shall be suitable for a maximum internal working pressure up to and including 0.40 bar¹⁾, measured at the top of the tank, and a maximum internal vacuum of 10 mbar. Tanks shall not be used at pressures or vacua higher than these values.

NOTE The plate thicknesses specified in this standard are based on a liquid contents relative density of unity (water). Special consideration should be given if the relative density of the liquid to be stored is significantly greater.

5 Standard tank sizes

5.1 Standard tank sizes shall conform to the dimensions given in Table 1A or Table 1B. The corresponding dished ends and compartment plates shall conform to the dimensions given in Table 2A or Table 2B as appropriate.

5.2 The ullages of the tanks given in Table 1A and Table 1B relate to tanks constructed with all butt-welded shells overlapping the dished ends. Depending on the type of shell plate arrangement used and the plate sizes available, there will necessarily be small variations in overall nominal capacities.

6 Forms of construction

6.1 The minimum thickness of dished end and compartment plates and shell plates shall be as given in Table 1A or Table 1B.

6.2 Two different methods of shell plate arrangement are permitted as follows:

- a) shell plated circumferentially; all seams with butt welds;

¹⁾ 1 bar = 10⁵ N/m² = 10² kPa.

b) shell plated circumferentially; lapped circumferential seams with butt welds for the longitudinal seams (by prior agreement with the purchaser only).

The method of welding lapped circumferential seams is illustrated in Figure 6.

6.3 Permissible forms of shell construction are illustrated in Figure 3.

6.4 The method of welding dished and flanged ends to the shell and a method of welding compartment plates to the shell are illustrated in Figure 4 and Figure 5.

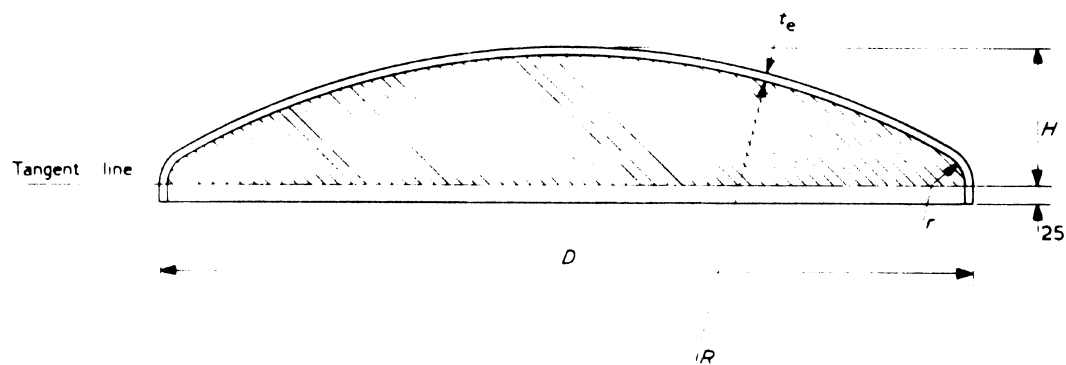


Figure 1 — Dished and flanged end configuration