# RWANDA STANDARD

# DRS 506

First edition

2022-mm-dd

## Rectangular pressed steel tanks — Specification



ICS 77.140.01

Reference number

DRS 506: 2022

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# Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 506 was prepared by Technical Committee RSB/TC 047, *Steel, aluminium and related products*.

In the preparation of this standard, reference was made to the following document:

1) IS 804:1967, *Specification for Rectangular Pressed Steel Tanks*

The assistance derived from the above source is hereby acknowledged with thanks.

## Committee membership

The following organizations were represented on the Technical Committee on *Steel, aluminium and related products* (RSB/TC 047) in the preparation of this standard.

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# Rectangular pressed steel tanks — Specification

## 1 Scope

**1.1** This Draft Rwanda Standard specifies requirements, samplingand test methods for materials, fabrication, erection and supply of rectangular pressed steel tanks used for the storage of cold water, hot water and certain other liquids under pressure not greater than the static head corresponding to the depth of the tank.

**1.2** This Draft Rwanda Standard does not cover the requirements of tanks storing liquids having temperatures higher than 100 ˚C, or those tanks subject to earth or other external pressures besides wind pressure.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

RS ISO 3573, *Hot-rolled carbon steel sheet of commercial and drawing qualities*

RS ISO 630 Structural steels

RS ISO 4016 *Hexagon head bolts — Product grade C*

RS ISO 4018 *Hexagon head screws — Product grade C*

RS ISO 14344 *Welding consumables — Procurement of filler materials and fluxes*

## 3 Terms and definitions

For the purposes of this standard, the following terms and definitions the apply.

**3.1**

**liquid**

substance which is in liquid state at atmospheric pressure

Note 1 to entry: Example of a liquid: kerosene, diesel fuel and water.

**3.2**

**cold water or cold liquid**

water or liquid at a temperature not exceeding 40 ˚C

**3.3**

**hot water or cold liquid**

water or liquid at a temperature above 40 ˚C, but not exceeding 100 ˚C

## 4 Types

**4.1** Pressed steel tanks shall be classified into the following three types:

a) **type 1**: Tanks with all flanges external (see Figure 1)

b) **type 2**: Tanks with all flanges internal

c) **type 3**: Tanks with bottom flanges internal and side flanges external

**4.2** Each of the above types may be either with open top or with covered top.

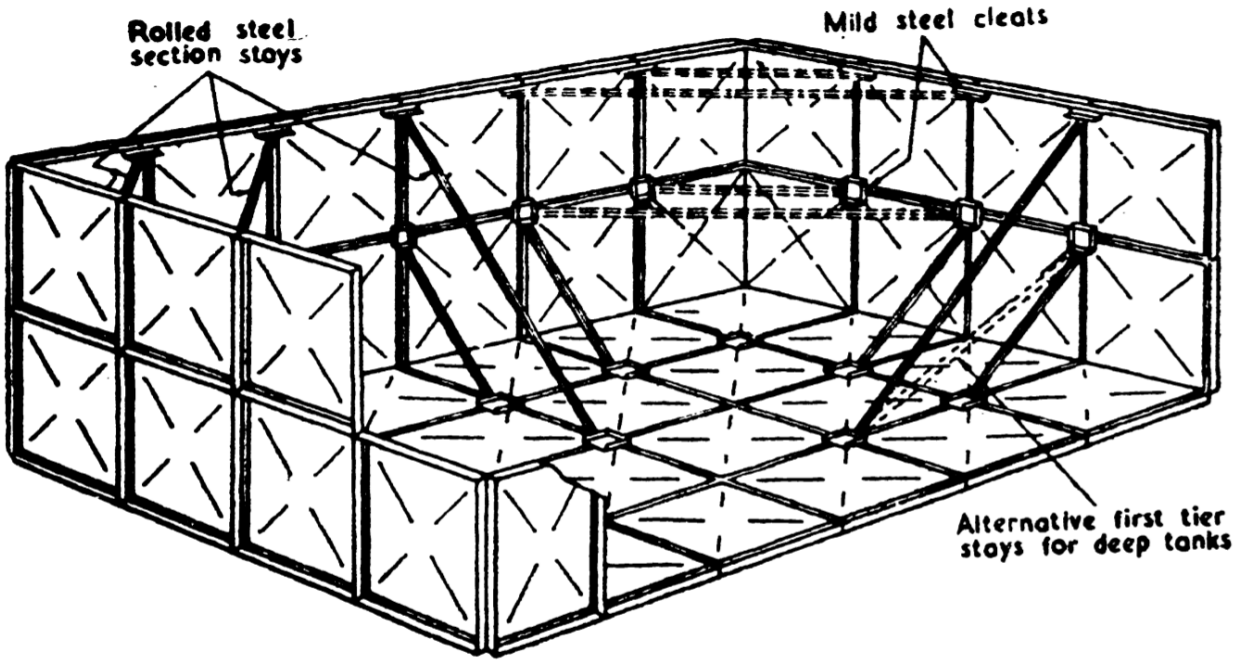
## 5 General requirements

**5.1** Pressed steel tanks are not recommended for depths greater than 5 m.

**5.2** Type 1 tanks are normally used where a plain internal surface is necessary or where there are no restrictions as to external access or where the exterior of the tank is to be lagged.

**5.3** Type 2 tanks are normally used at a location where access to the exterior for erection is precluded due to insufficient space inside a building.

**5.4** Type 2 and 3 tanks are suitable for use where they are to be erected on a solid level floor.




NOTE 1 For tanks of 2.5 m and less length and width, the stays may be horizontal from end to end and/or side to side.

NOTE 2 This figure is diagrammatic, and illustrative only and does not purport to represent any particular design.

**Figure 1 — Typical pressed steel sectional rectangular tank with external flanges**

## 6 Materials

**6.1** Mild steel plate and components used in pressed steel tanks shall be in accordance with RS ISO 630. Mild steel sheets used in the manufacture of pressed tanks shall be in accordance with RS ISO 3573.

**6.2** Bolts and nuts used shall be of mild steel. They shall be hexagonal and finished black in accordance with RS ISO 4016 and RS ISO 4018.

### 6.3 Joint material

**6.3.1** The material used for jointing shall be insoluble in the liquid to be stored and shall be capable of withstanding the temperature variation in the liquid to be stored in the tank (refer to 3.2). It shall be of a suitable type depending upon the purpose for which the tank is to be used and shall be as agreed to between the purchaser and the manufacturer.

**6.3.2** Electrodes used for welding shall be in accordance with RS ISO 14344.

## 7 Dimensions

**7.1** The nominal size of unit plate shall be 1·25 $m^2$, the actual overall dimensions depending upon the particular manufacturer of the plates. The size of tanks shall be specified as multiples of the nominal dimensions of 1.25

m. The nominal capacity shall be based upon the nominal dimensions of the tank, for example, 1.25 x 1.25 x 1.25 m equals 1950 L.

**7.2** Pressed mild steel tanks shall be either 1.25 m, 2.50 m, 3.75 m or 5.00 m deep. Typical sizes, approximate weights and nominal capacity of Type I tanks with open tops for the depths mentioned above are given respectively in Tables 1, 2, 3 and 4.

**7.3** The minimum nominal thickness of plates used for different depths of tanks used for storage of cold liquids with specific gravity not exceeding 1.0 shall be as given in Table 5.

**7.3.1** In the case of hot liquids with specific gravity not exceeding 1.0, the thickness of plates for different depths of tanks shall be in accordance with Table 5 except that no plate of the tank shall be less than 6.0 mm thick.

**Table 1 — Typical sizes, approximate weight and nominal capacities of tanks with external flanges for "tanks 1.25 metres deep, plate 5.0 mm thick throughout"**

| $\frac{Nominal\ size}{Length \times Breadth}$ $m \times m$ | Plates in tanks number | Nominal capacity L | Approximate total weight empty kg | $\frac{Approximate\ outside\ dimensions, m}{Length\ \ Breadth\ \ Depth}$ | | |
|---|---|---|---|---|---|---|
| 1.25 × 1.25* | 5 | 1 950 | 400 | 1.40 | 1.40 | 1.33 |
| 2.50 × 1.25 | 8 | 3 900 | 700 | 2.65 | 1.40 | 1.33 |
| 3.75 × 1.25 | 11 | 5 850 | 900 | 3.90 | 1.40 | 1.33 |
| 5.00 × 1.25 | 14 | 7 800 | 1 200 | 5.15 | 1.40 | 1.33 |
| 2.50 × 2.50 | 12 | 7 800 | 1 000 | 2.65 | 2.65 | 1.33 |
| 3.75 × 2.50 | 16 | 11 700 | 1 350 | 3.90 | 2.65 | 1.33 |
| 5.00 × 2.50 | 20 | 15 600 | 1 650 | 5.15 | 2.65 | 1.33 |
| 6.25 × 2.50 | 24 | 19 500 | 2 050 | 2.65 | 2.65 | 1.33 |
| 3.75 × 3.75 | 21 | 17 550 | 1 750 | 3.90 | 3.90 | 1.33 |
| 5.00 × 3.75 | 26 | 23 400 | 2 200 | 5.15 | 3.90 | 1.33 |
| 6.25 × 9.75 | 31 | 29 950 | 2 600 | 6.40 | 3.90 | 1.33 |
| 7.50 × 3.75 | 36 | 35 100 | 3 050 | 7.65 | 3.90 | 1.33 |
| 8.75 × 3.75 | 41 | 40 950 | 3 500 | 8.90 | 3.90 | 1.33 |
| 5.00 × 5.00 | 32 | 31 200 | 2 700 | 5.15 | 5.15 | 1.33 |
| 6.25 × 5.00 | 38 | 39 000 | 3 200 | 6.40 | 5.15 | 1.33 |
| 7.50 × 5.00 | 44 | 46 800 | 2 700 | 7.65 | 5.15 | 1.33 |
| 8.75 × 5.00 | 50 | 54 600 | 4 250 | 8.90 | 5.15 | 1.33 |
| 10.00 × 5.00 | 56 | 62 400 | 4 800 | 10.15 | 5.15 | 1.33 |
| 6.25 × 6.25 | 45 | 48 750 | 3 800 | 6.40 | 6.40 | 1.33 |
| 7.50 × 6.25 | 52 | 58 500 | 4 400 | 7.65 | 6.40 | 1.33 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7.50 × 7.50 | 60 | 70 200 | 4 950 | 7.65 | 7.65 | 1.33 |
| 8.75 × 8.75 | 77 | 95 550 | 6 450 | 8.90 | 8.90 | 1.33 |

*Thickness of sheets for this tank only is 3.15 mm throughout

| Nominal Size Length × Breadth m × m | Plates in Tanks Number | Nominal Capacity Litres | Approximate Total Weight Empty kg | Approximate Outside Dimensions, m Length | Breadth | Depth |
|---|---|---|---|---|---|---|
| 1·25 × 1·25* | 5 | 1 950 | 400 | 1·40 | 1·40 | 1·33 |
| 2·50 × 1·25 | 8 | 3 900 | 700 | 2·65 | 1·40 | 1·33 |
| 3·75 × 1·25 | 11 | 5 850 | 900 | 3·90 | 1·40 | 1·33 |
| 5·00 × 1·25 | 14 | 7 800 | 1 200 | 5·15 | 1·40 | 1·33 |
| 2·50 × 2·50 | 12 | 7 800 | 1 000 | 2·65 | 2·65 | 1·33 |
| 3·75 × 2·50 | 16 | 11 700 | 1 350 | 3·90 | 2·65 | 1·33 |
| 5·00 × 2·50 | 20 | 15 600 | 1 650 | 5·15 | 2·65 | 1·33 |
| 6·25 × 2·50 | 24 | 19 500 | 2 050 | 6·40 | 2·65 | 1·33 |
| 3·75 × 3·75 | 21 | 17 550 | 1 750 | 3·90 | 3·90 | 1·33 |
| 5·00 × 3·75 | 26 | 23 400 | 2 200 | 5·15 | 3·90 | 1·33 |
| 6·25 × 3·75 | 31 | 29 250 | 2 600 | 6·40 | 3·90 | 1·33 |
| 7·50 × 3·75 | 36 | 35 100 | 3 050 | 7·65 | 3·90 | 1·33 |
| 8·75 × 3·75 | 41 | 40 950 | 3 500 | 8·90 | 3·90 | 1·33 |
| 5·00 × 5·00 | 32 | 31 200 | 2 700 | 5·15 | 5·15 | 1·33 |
| 6·25 × 5·00 | 38 | 39 000 | 3 200 | 6·40 | 5·15 | 1·33 |
| 7·50 × 5·00 | 44 | 46 800 | 3 700 | 7·65 | 5·15 | 1·33 |
| 8·75 × 5·00 | 50 | 54 600 | 4 250 | 8·90 | 5·15 | 1·33 |
| 10·00 × 5·00 | 56 | 62 400 | 4 800 | 10·15 | 5·15 | 1·33 |
| 6·25 × 6·25 | 45 | 48 750 | 3 800 | 6·40 | 6·40 | 1·33 |
| 7·50 × 6·25 | 52 | 58 500 | 4 400 | 7·65 | 6·40 | 1·33 |
| 7·50 × 7·50 | 60 | 70 200 | 4 950 | 7·65 | 7·65 | 1·33 |
| 8·75 × 8·75 | 77 | 95 550 | 6 450 | 8·90 | 8·90 | 1·33 |

*Thickness of sheets for this tank only is 3.15 mm throughout

NOTE The capacity of tank with joints as in Figure 2 will have proportionate reduction in capacity.

**Table 2 — Typical sizes, approximate weight and nominal capacities of tanks with external flanges "fanks 2.50 metres deep, plates 5.0 mm and 6.0 mm thick"**

| Nominal Size Length × Breadth m × m | Plates in Tanks Number | Nominal Capacity Liters | Approximate Total Weight Empty kg | Approximate Outside Dimensions, m Length | Breadth | Depth |
|---|---|---|---|---|---|---|
| 2·50 × 1·25 | 14 | 7 800 | 1 400 | 2·65 | 1·40 | 2·58 |
| 3·75 × 1·25 | 19 | 11 700 | 1 900 | 3·90 | 1·40 | 2·58 |
| 5·00 × 1·25 | 24 | 15 600 | 2 450 | 5·15 | 1·40 | 2·58 |
| 2·50 × 2·50 | 20 | 15 600 | 2 000 | 2·65 | 2·65 | 2·58 |
| 3·75 × 2·50 | 26 | 23 400 | 2 650 | 3·90 | 2·65 | 2·58 |
| 5·00 × 2·50 | 32 | 31 200 | 3 300 | 5·15 | 2·65 | 2·58 |
| 6·25 × 2·50 | 38 | 39 000 | 3 900 | 6·40 | 2·65 | 2·58 |
| 3·75 × 3·75 | 33 | 35 100 | 3 350 | 3·90 | 3·90 | 2·58 |
| 5·00 × 3·75 | 40 | 46 800 | 4 100 | 5·15 | 3·90 | 2·58 |
| 6·25 × 3·75 | 47 | 58 500 | 4 850 | 6·40 | 3·90 | 2·58 |
| 7·50 × 3·75 | 54 | 70 200 | 5 550 | 7·65 | 3·90 | 2·58 |
| 8·75 × 3·75 | 61 | 81 900 | 6 300 | 8·90 | 3·90 | 2·58 |
| 5·00 × 5·00 | 48 | 62 400 | 4 950 | 5·15 | 5·15 | 2·58 |
| 6·25 × 5·00 | 56 | 78 000 | 5 800 | 6·40 | 5·15 | 2·58 |
| 7·50 × 5·00 | 64 | 93 600 | 6 700 | 7·65 | 7·65 | 2·58 |
| 8·75 × 5·00 | 72 | 109 200 | 7 550 | 8·90 | 5·15 | 2·58 |
| 10·00 × 5·00 | 80 | 124 800 | 8 450 | 10·15 | 5·15 | 2·58 |
| 6·25 × 6·25 | 65 | 97 500 | 6 850 | 6·40 | 6·40 | 2·58 |
| 7·50 × 6·25 | 74 | 117 000 | 7 700 | 7·65 | 6·40 | 2·58 |
| 7·50 × 7·50 | 84 | 140 400 | 8 850 | 7·65 | 7·65 | 2·58 |
| 8·75 × 8·75 | 105 | 191 100 | 11 000 | 8·90 | 8·90 | 2·58 |

**Table 3 — Typical sizes, approximate weight and nominal capacities of tanks with external flanges for "tanks 3.75 metres deep, plates 5.0 mm and 6.0 mm thick"**

| Nominal Size Length × Breadth m × m | Plates in Tank Number | Nominal Capacity Litres | Approximate Total Weight Empty kg | Approximate Outside Dimensions, m Length | Breadth | Depth |
|---|---|---|---|---|---|---|
| 3·75 × 3·75 | 45 | 52 650 | 5 050 | 3·90 | 3·90 | 3·83 |
| 5·00 × 3·75 | 54 | 70 200 | 6 100 | 5·15 | 3·90 | 3·83 |
| 5·00 × 5·00 | 64 | 93 600 | 7 200 | 5·15 | 5·15 | 3·83 |
| 6·25 × 5·00 | 74 | 117 000 | 8 400 | 6·40 | 5·15 | 3·83 |
| 6·25 × 6·25 | 85 | 146 250 | 9 550 | 6·40 | 6·40 | 3·83 |
| 7·50 × 6·25 | 96 | 175 500 | 10 900 | 7·65 | 6·40 | 3·83 |
| 7·50 × 7·50 | 108 | 210 600 | 12 350 | 7·65 | 7·65 | 3·83 |
| 8·75 × 7·50 | 120 | 245 700 | 13 650 | 8·90 | 7·65 | 3·83 |
| 8·75 × 8·75 | 133 | 286 650 | 15 100 | 8·90 | 8·90 | 3·83 |
| 8·75 × 8·75 | 146 | 327 600 | 16 600 | 10·15 | 8·90 | 3·83 |
| 11·25 × 8·75 | 159 | 368 550 | 18 150 | 11·40 | 8·90 | 3·83 |
| 10·00 × 10·00 | 160 | 374 400 | 18 200 | 10·15 | 10·15 | 3·83 |
| 11·25 × 10·00 | 174 | 421 200 | 20 000 | 11·40 | 10·15 | 3·83 |
| 12·50 × 10·00 | 188 | 468 000 | 21 500 | 12·65 | 10·15 | 3·83 |
| 11·25 × 11·25 | 189 | 473 850 | 21 600 | 11·40 | 11·40 | 3·83 |
| 12·50 × 11·25 | 204 | 526 500 | 23 300 | 12·65 | 11·40 | 3·83 |
| 12·50 × 12·50 | 220 | 585 000 | 25 200 | 12·65 | 12·65 | 3·83 |
| 13·75 × 12·50 | 236 | 643 500 | 27 000 | 13·90 | 12·65 | 3·83 |
| 13·75 × 13·75 | 253 | 707 850 | 29 900 | 13·90 | 13·90 | 3·83 |
| 15·00 × 13·75 | 270 | 772 200 | 30 950 | 15·15 | 13·90 | 3·83 |
| 15·00 × 15·00 | 288 | 842 400 | 33 000 | 15·15 | 15·15 | 3·83 |
| 16·25 × 15·00 | 306 | 912 600 | 35 000 | 16·40 | 15·15 | 3·83 |
| 16·25 × 16·25 | 325 | 988 650 | 37 300 | 16·40 | 16·40 | 3·83 |

**Table 4 — Typical sizes, approximate weight and nominal capacities of tanks with external flanges for "tanks 5 metres deep, plates 5.0 mm, 6.0 mm and 8.0 mm thick".**

| Nominal Size Length × Breadth m × m | Plates in Tank Number | Nominal Capacity Litres | Approximate Total Weight Empty kg | Approximate Outside Dimensions, m Length | Breadth | Depth |
|---|---|---|---|---|---|---|
| 3·75 × 3·75 | 57 | 70 200 | 7 100 | 3·90 | 3·90 | 5·08 |
| 5·00 × 3·75 | 68 | 93 600 | 8 850 | 5·15 | 3·90 | 5·08 |
| 5·00 × 5·00 | 80 | 124 800 | 10 250 | 5·15 | 5·15 | 5·08 |
| 6·25 × 5·00 | 92 | 156 000 | 11 800 | 6·40 | 5·15 | 5·08 |
| 6·25 × 6·25 | 105 | 195 000 | 13 550 | 6·40 | 6·40 | 5·08 |
| 7·50 × 6·25 | 118 | 234 000 | 15 300 | 7·65 | 6·40 | 5·08 |
| 7·50 × 7·50 | 132 | 280 800 | 17 200 | 7·65 | 7·65 | 5·08 |
| 8·75 × 7·50 | 146 | 327 600 | 19 050 | 8·90 | 7·65 | 5·08 |
| 8·75 × 8·75 | 161 | 382 200 | 21 000 | 8·90 | 8·90 | 5·08 |
| 10·00 × 8·75 | 176 | 436 800 | 23 150 | 10·15 | 8·90 | 5·08 |
| 11·25 × 8·75 | 191 | 491 400 | 25 100 | 11·40 | 8·90 | 5·08 |
| 10·00 × 10·00 | 192 | 499 200 | 25 300 | 10·15 | 10·15 | 5·08 |
| 11·25 × 10·00 | 208 | 561 600 | 27 400 | 11·40 | 10·15 | 5·08 |
| 12·50 × 10·00 | 224 | 624 000 | 29 600 | 12·65 | 10·15 | 5·08 |
| 11·25 × 11·25 | 225 | 631 800 | 30 000 | 11·40 | 11·40 | 5·08 |
| 12·50 × 11·25 | 242 | 702 000 | 32 100 | 12·65 | 11·40 | 5·08 |
| 12·50 × 12·50 | 260 | 780 000 | 34 500 | 12·65 | 12·65 | 5·08 |
| 13·75 × 12·50 | 278 | 858 000 | 37 000 | 13·90 | 12·65 | 5·08 |
| 13·75 × 13·75 | 297 | 943 800 | 39 600 | 13·90 | 13·90 | 5·08 |
| 15·00 × 13·75 | 316 | 1 029 600 | 42 250 | 15·15 | 13·90 | 5·08 |
| 15·00 × 15·00 | 336 | 1 123 200 | 45 000 | 15·15 | 15·15 | 5·08 |
| 16·25 × 15·00 | 356 | 1 216 800 | 47 700 | 16·40 | 15·15 | 5·08 |
| 16·25 × 16·25 | 377 | 1 318 200 | 50 700 | 16·40 | 16·40 | 5·08 |

**Table 5 — Minimum nominal thickness of plates**

| Depth of Tank | Description of Plates with Regard to Their Location | Thickness of Plates Sheets |
|---|---|---|
| m | | mm |
| 1·25 | Bottom, sides ( cubic tank only ) | 3·15 |
| 2·50 | Bottom and first tier of sides | 6·0 |
| | Top tier of sides | 5·0 |
| 3·75 | Bottom and first tier of sides | 6·0 |
| | Second tier of sides | 6·0 |
| | Top tier of sides | 5·0 |
| 5·00 | Bottom and first tier of sides | 8·0 |
| | Second and third tier of sides | 6·0 |
| | Top tier of sides | 5·0 |

**Table 1.1 Amendment to Table 1 — Replace the values for Aproximate total weight empty (kg) by the values stated below.**

| Nominal Size (Length × Breadth) m × m | Approximate Total Weight Empty kg |
|---|---|
| 1.25 × 1.25* | 250 |
| 2.50 × 1.25 | 650 |
| 3.75 × 1.25 | 850 |
| 5.00 × 1.25 | 1 100 |
| 2.50 × 2.50 | 950 |
| 3.75 × 2.50 | 1 250 |
| 5.00 × 2.50 | 1 550 |
| 6.25 × 2.50 | 1 850 |
| 3.75 × 3.75 | 1 650 |
| 5.00 × 3.75 | 2 000 |
| 6.25 × 3.75 | 2 400 |
| 7.50 × 3.75 | 2 800 |
| 8.75 × 3.75 | 3 150 |
| 5.00 × 5.00 | 2 500 |
| 6.25 × 5.00 | 2 950 |
| 7.50 × 5.00 | 3 400 |
| 8.75 × 5.00 | 3 850 |
| 10.00 × 5.00 | 4 350 |
| 6.25 × 6.25 | 3 500 |
| 7.50 × 6.25 | 4 000 |
| 7.50 × 7.50 | 4 650 |
| 8.75 × 8.75 | 5 950 |

* Thickness of sheets for this tank only is 3.15 mm throughout.

**7.3.2** For cold or hot liquids with specific gravity greater than 1-0, the thickness of plates shall be as agreed to between the purchaser and the manufacturer.

## 8 Fabrication

**8.1** The plates shall be heated unifomly in a furnace and formed in a press, each of which shall be capable of taking the whole plate at one time. Alternatively, the plates may be pressed cold, the flanges made by V die and the comers welded provided no cracks develop. Re-drawing of plates to bring the same to the specified dimensions shall not be permitted.

**8.2** The flanges of the plates shall be pressed square or partly square and partly at an angle of 45° to the face of the plate or all 45° to the face of the plate (refer to Figure 2, 3 and 4).

**8.3** All steel plates, bars and stays shall be carefully levelled and straightened according to the approved methods including hammering before and after they are being punched or drilled if considered necessary by the inspector. The width of the flanges shall be suitable for the connecting bolts used.

**8.4** They shall have holes accurately drilled or punched in jigs so that the bolt holes are alignable and interchangeable with those of any other matching flange. The spacing of the bolt holes in the flanges shall not exceed 80 mm. For 1.25 m cubic tanks, the diameter of bolts should be 12 mm, except for the roof where it may be up to 10 mm diameter (alternatively 8 mm with the maximum spacing of 55 mm including for the roof).

**8.5** For other tanks, the diameter of bolts should normally be 14 mm or over, except at the roof where it may be up to 12 mm.

**8.6** If any other arrangement for the size of flange, diameter of the bolt and spacing of the bolt is desirable, these shall be as agreed to between the purchaser and the manufacturer. Wherever necessary, the flange bolt should be fitted with washers under nut.



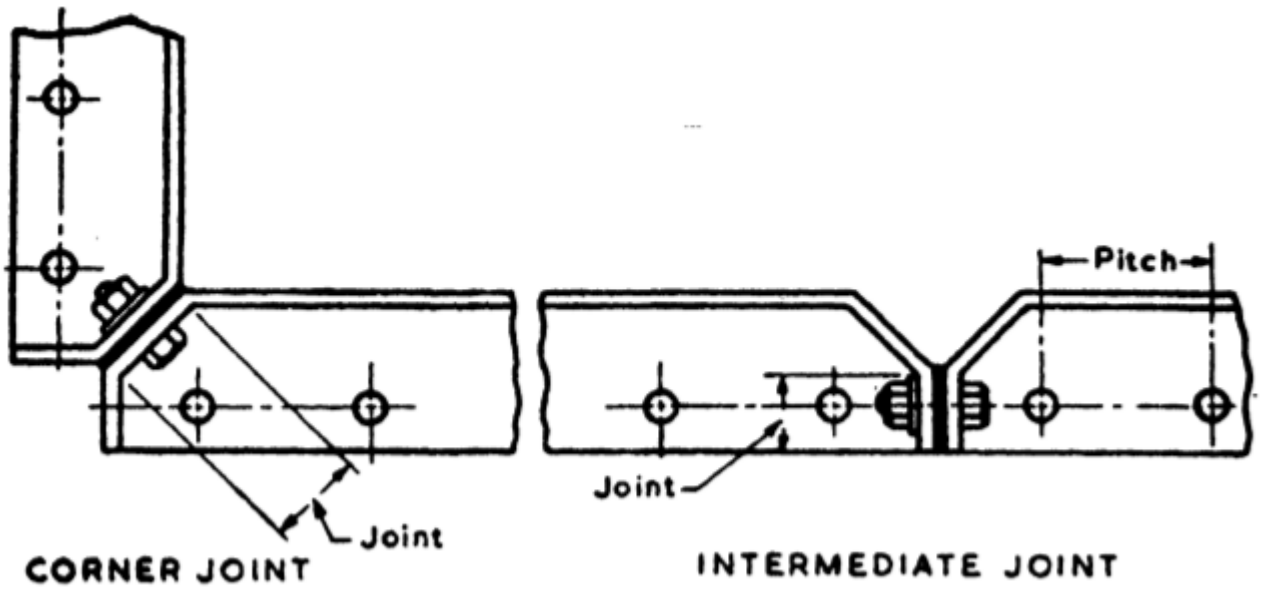



**Figure 2 — Flange joints (partly squared)**

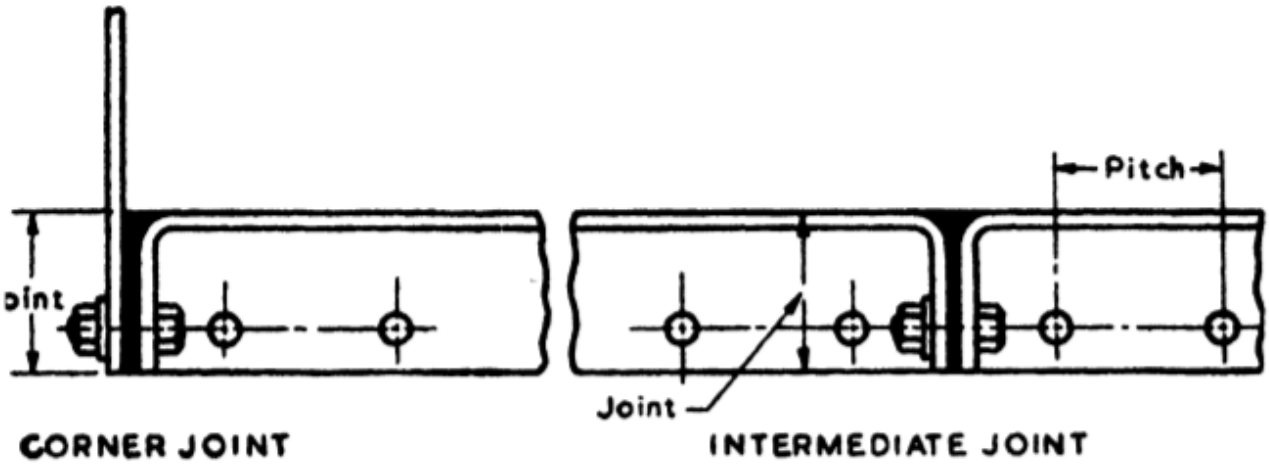



**Figure 3 — Flange joints (squared)**

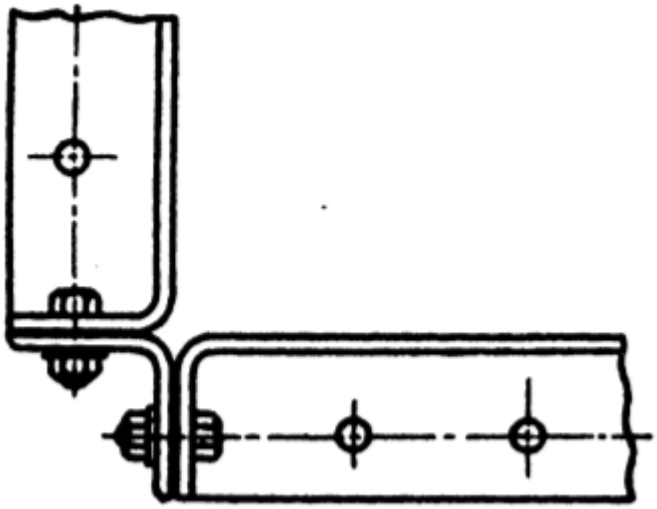


**Figure 4 — Corner details**

**8.7** The sides of tanks shall be supported by stays at the junction of two or more plates; the stays shall be made from mild steel rolled sections. They shall be attached to the plates by bolting to the flanges or by mild steel cleats of strength equal to that of stays bolted to the tank plates. The stays shall connect sides to bottom, and/or horizontally sides to sides generally in accordance with Figure 1.

**8.8** All outside edges of gussets shall be cut neatly and accurately and the edges ground where necessary. All burrs left by the drill and the sharp edges of all bolt hole, shall be completely removed. All steel work intended to be riveted or bolted shall be completely in contact over the entire surface.

**8.9** All parts of steel tanks shall be coated with paint conforming to relevant approved standards and the paint shall be suitable for storage of the liquid for which the tank is intended.

**8.10** Pads for connection, tapped bosses, screwed flanges or sockets, as may be required by the purchaser, shall be welded to the inside or outside or bolted to the tank plate. Pads shall be seal welded and drilled and/or tapped to suit flanges.

Single pads shall be provided for connections on one side of the plate and double pads for connection on both sides of the plate. Tapped sockets shall be in accordance with the requirements of relevant approved standards. Where possible, connections shall be so positioned so as to avoid the embossment of the plate (see. Fig. 5 to 9). When double connections are to be provided in the pads, the studs shall be staggered on opposite faces.

**8.11** Inlet pipes and the overflow pipe, if arranged through the bottom of the tank only, shall be of bell mouth type.

**8.12** Where connections are welded to the tank as well as where the corners are welded, the welding shall be done by the metal arc process. The plates and connections shall be prepared with care, and fusion faces shall be reasonably free from rust, paint or other foreign matter. Where the plates are cut, edges shall be dressed smooth. Pads shall be in fair contact with the plates before the welding is resorted to. All welds should be made in the down hand position. The size of the welds shall conform to those shown in Fig. 5 to 9. The surfaces of the welds shall be even, free from cracks or blow holes. The welds shall be completely fused to the parent metal without undercut.

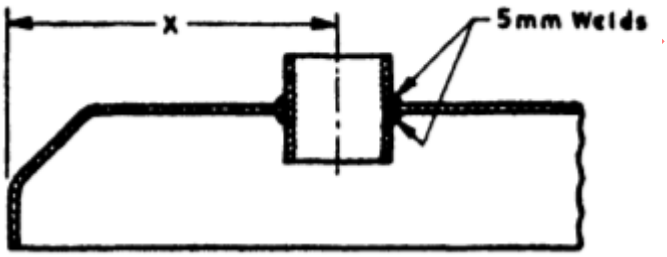



**Figure 5 — Tapped socket or boss welded into tank plate**

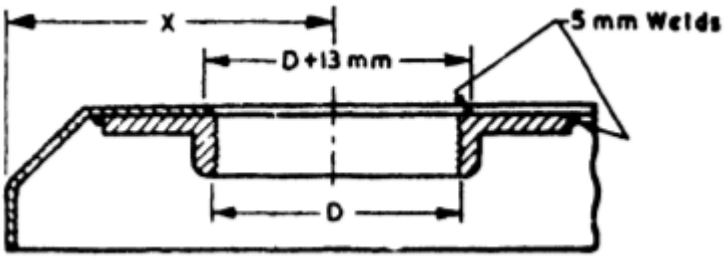



**Figure 6 — Screwed flange welded to tank plate**

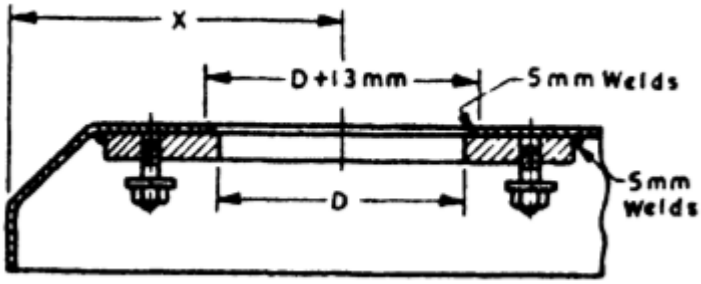



**Figure 7 — Single pad welded to tank plate**

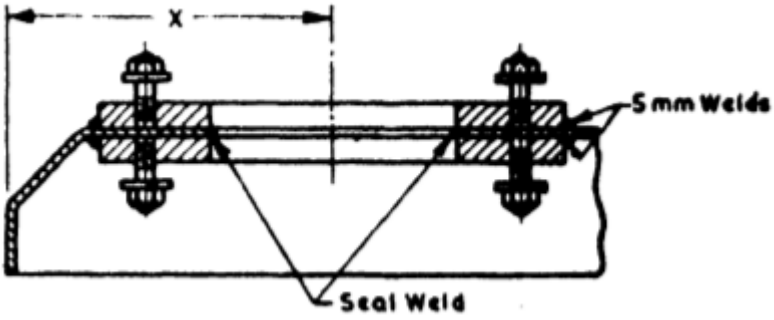



**Figure 8 — Double pad welded to tank plate (pads for 50 mm pip and under, sealing welds omitted)**

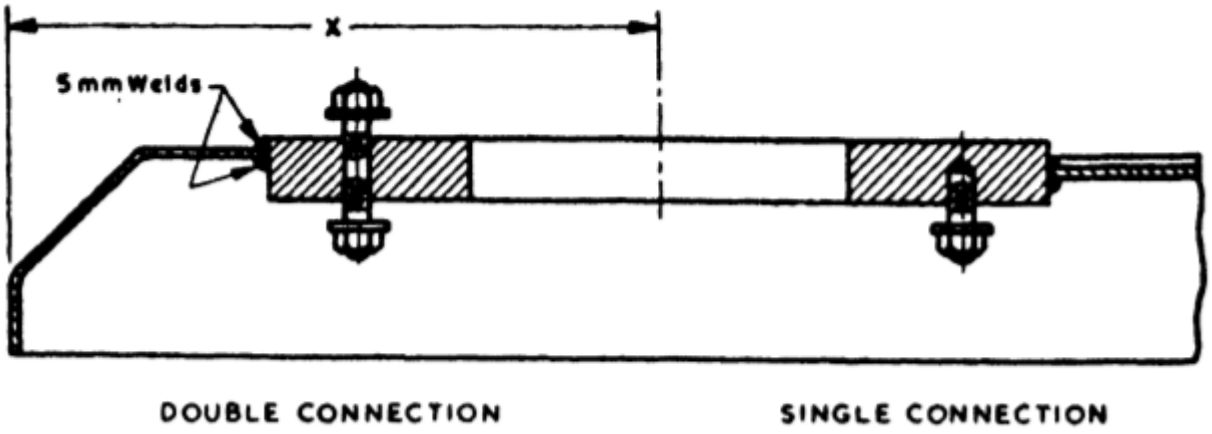



**Figure 9 — Thick pad welded to tank plate**

**8.12** Tanks that are 2.5 m deep or more shall be provided with a mild steel internal access ladder of minimum width of 40 cm. In the case of covered tanks, the ladder shall be adjacent to the manhole.

## 8.13 Coverings

**8.13.1** In the case of covered top tanks, the coverings may be of the following types:

a) Mild steel plate shall be in accordance with RS ISO 630 and mild steel shall be in accordance with RS ISO 3573; and

b) Galvanized sheets shall be in accordance with RS EAS 11.

**8.13.2** Asbestos sheets shall never be permitted for use.

NOTE 1 Mild steel cover plates shall be 3.15 mm thick.

NOTE 2 The design and construction of the cover shall be such that the rain water can drain off easily.

**8.13.3** In all cases, covered top tanks shall be provided with a manhole of diameter not less than 450 mm if circular, or 450 x 450 mm if square, to give access to the inside of the tank. In the case of covered top tanks there shall be no opening at the junction of the top cover with the sides which will allow mosquitoes inside the tank.

**8.13.4** In the case of covered top tanks, there shall be no opening at the junction of the top cover with the sides which will allow mosquitoes inside the tank. Vent pipes may be provided, if required by the purchaser. The vertical vent pipe, if necessary, shall be provided on top with a flanged bend, the mouth of the bend being fitted with a mosquito proof netting.

**8.13.5** Covering of tanks shall be adequately supported by rolled steel or pressed steel bearers or trusses. If the top cover acts as an effective tie, the top horizontal stays may be omitted.

## 9 Workmanship

The workmanship shall be of the highest order and the finished tanks shall be free from all defects of manufacture. Accuracy shall be observed in the design, manufacture and erection of every part of the tank. All similar parts shall be strictly interchangeable. All joints shall be leak-proof and the edges of flanges finished flush with each other.

## 10 Erection

**10.10** The tanks shall be erected in accordance with the detailed drawings and manufacturer's instructions.

**10.11** Where tank with external flanges is to be erected at ground level, adequate working space for erection is required all round; underneath and above the finished size of the tank.

**10.12** All tanks shall be effectively supported under each transverse joint and both ends of the tanks. This may be by the following:

a) rolled steel joists forming beams and architraves mounted on dwarf pillars (refer to Figure 10). Joists shall be designed to carry the imposed load with a maximum deflection of one part in one five-hundredth of the span; and
b) dwarf walls of brick or concrete with footings to suit the depth of tank and the nature of ground. Dwarf walls for 3.75 m of 5 m deep tanks shall have a mild steel capping plate to provide a bearing surface on the wall (Refer to Figure 11).

**10.13** After erection, the tank shall be finished with two coats of suitable anti-corrosive paint mutually agreed to between the manufacturer and the purchaser.



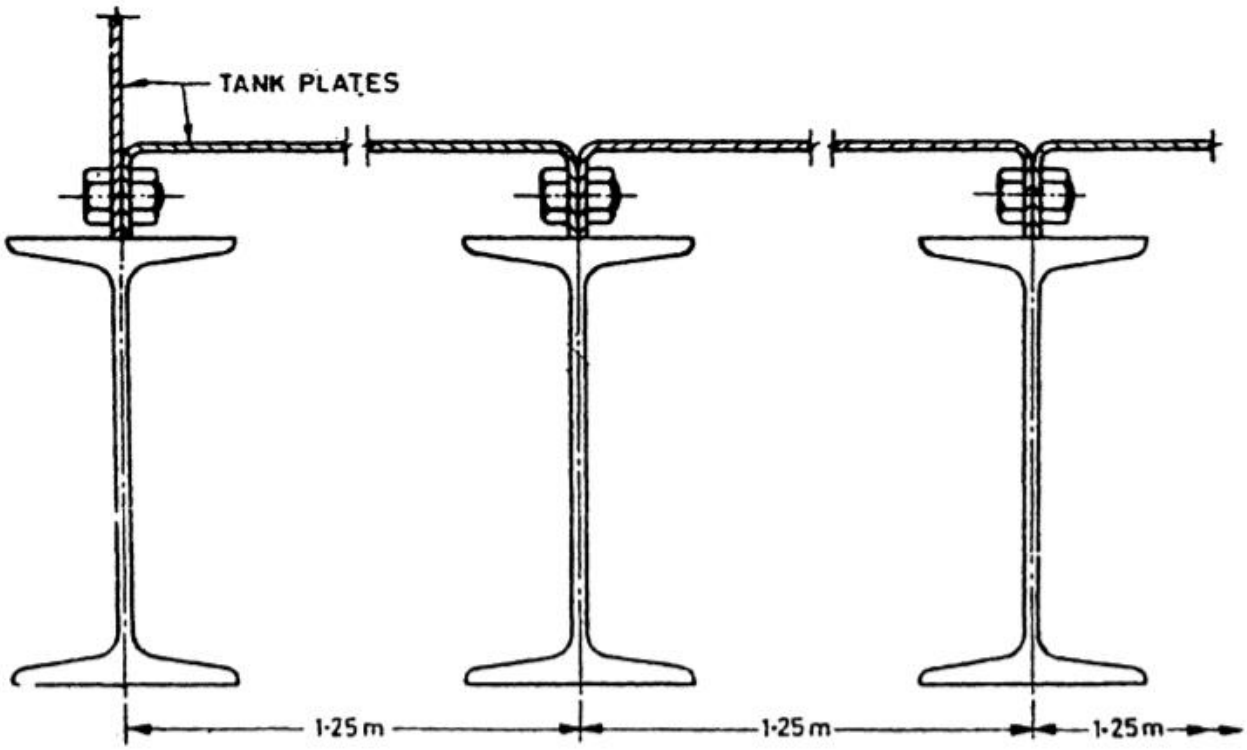



**Figure 10 — Rolled steel joist supports for pressed steel tanks**

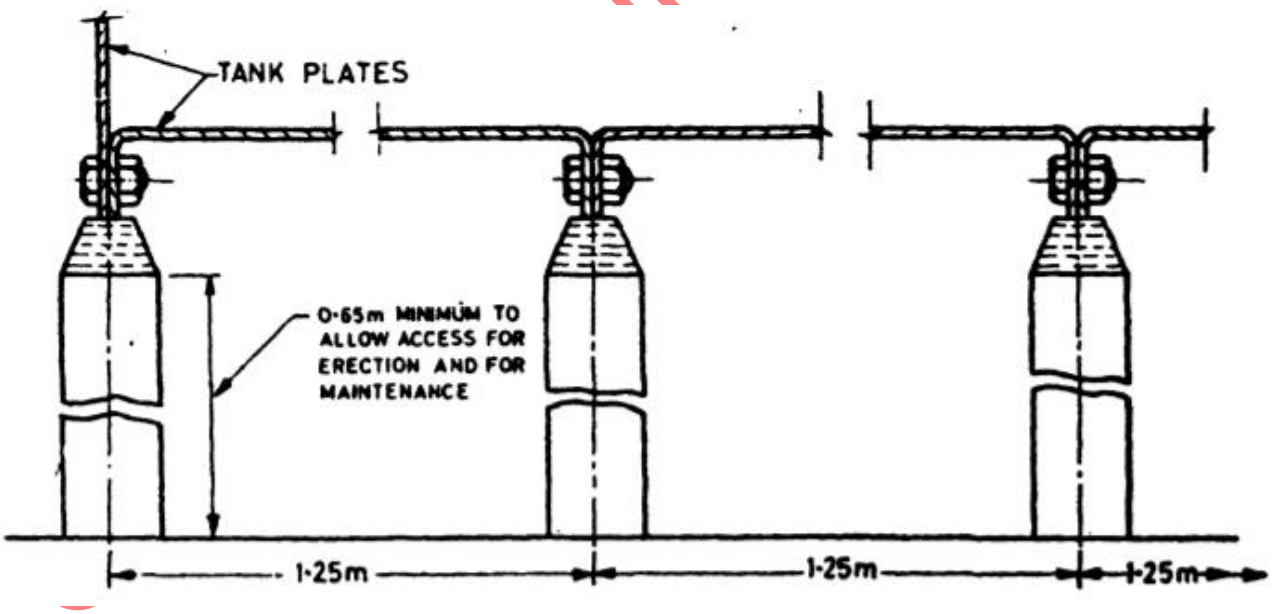



**Figure 11 — Dwarf wall supports for pressed steel tanks**

## 11 Test

Each tank shall be tested at site after erection for leakage under full static head.

## 12 Inspection

The purchaser or his representative shall have access to the works of the manufacturer at all reasonable times and shall be at liberty to inspect and to reject any material which does not conform to the requirements of this standard.

## 13 Packing

All reasonable precautions to protect the components of the tanks from injury in transit shall be taken. They shall be packed in convenient bundle, riveted or bolted together or bound with iron strip or suitable wire. All rivets, bolts, nuts, etc., shall be packed in suitable container according to trade practice.

## 14 Marking

**14.1** A suitable name plate showing the name of the manufacturer, capacity in litres, dimensions and other details as required by the purchaser shall be attached properly so as to be prominently visible. An indelible identification mark shall be made by the supplier to facilitate erection, site fabrication and rection of the tank.

**14.2** In addition to the requirements of 14.1, the material may also be permanently marked with a Standardization Mark in accordance with relevant National Standards Body or competent Certification Body's requirements or relevant rules and regulations.

## 15 Order information

When ordering a pressed steel tank, the purchaser shall provide the manufacturer with detailed information in accordance with Annex B. The manufacturer may require information in addition to that required in Annex B.

(normative)



# Annex A
(normative)

## Information to be supplied with the enquiry and order

The following details should be supplied by the purchaser at the time of enquiry and order:

a) type of tank required, that is Type I, Type 2 or Type 3 (Refer to Clause 4)., type of cover (if any), number and position and type of manhole(s);
b) capacity required in litres or dimensions in metres in multiples of 1.25 m and if any provision is to be made for future extension;
c) limiting condition, if any, as to space and accessibility for erection, and whether the tank will be erected inside a building or exposed to the weather. If any partition is required, particulars to be given;
d) nature and specific gravity of liquid for which the tank is required. If corrosive, particulars to be given. If the tank is required for storage of water, the fact whether it is hard or soft, to be stated. If water level indicator is to be supplied, particulars of fixing the water level indicator to be given indicating its location;
e) maximum temperature and boiling point of the liquid;
f) any special requirements as to jointing material and as to internal and external coating or lagging;
g) particulars of connections and drilling required and precise location on tank with dimensioned sketches, having regard to possible future requirements;
h) whether external access ladders are required and, if so, particulars to be given;
i) details of any existing or proposed supporting structure and height of bottom of tank above ground level;
j) whether transverse supporting bearers are required and, if so, particulars as to span and end support to be given;
k) whether inspection will be made by the representative of the purchaser at the works of the manufacture;
l) where erection and test are to be carried out by the manufacturer at site, if so, information as to site conditions and accessibility to be given by the purchaser, and whether water or liquid for testing will be made available by the purchaser to be stated;
m) tolerances of the dimensions, with reference to this standard; and
n) reference number of this standard, RS 506.

# Bibliography

[1] ISO 14895:2016, *Small craft — Liquid-fuelled galley stoves and heating appliances*

Price based on 17 pages