

**SPECIFICATION**  
**FOR**  
**LOCAL AND WORKING STANDARDS**  
**OF**  
**CAPACITY**  
**METAL CONTENTS MEASURES**  
**(Proving Tanks)**

In accordance with the provisions of section 4(2) and 5(5) of the Weights and Measures Act 1985, the Secretary of State hereby approves the material and form of local and working standards of capacity conforming with this specification.

This specification, together with 7312, supersedes SWM 267 (November 1976) and SWM 253 (August 1966)

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**Department of Trade & Industry**

STD 4827

## SPECIFICATION FOR STANDARDS OF CAPACITY

### METAL CONTENTS MEASURES (Proving Tanks)

#### NOMINAL CAPACITIES

- 1 The nominal capacities shall be multiples of 20 gallons or of 100 litres.
- 2 The minimum recommended capacity of a proving tank is that it should contain one minutes delivery of the meter under test.
- 3 Preferred sizes are:

<u>Imperial</u>	<u>Metric</u>
100 gallons	500 litres
200 “	1000 “
500 “	2000 “
1000 “	5000 “

#### MATERIALS

- 4 The measures shall be made of mild steel, coated internally with epoxy resin lining to API Standard 1101, or of stainless steel.

#### GENERAL CONSTRUCTION

- 5 The measures shall be in the form of a vertical cylinder connected by two conical sections to a neck and a sump. The base angle of each cone should be approximately 30°.
- 6 The measures shall be sufficiently robust to withstand normal usage. They shall be supported by legs and shall have levelling means provided. Means shall be provided to check that the axis of the tank is vertical. Spirit level (s) of suitable sensitivity, or datum surface(s) to accommodate them, shall be provided.
- 7 A measure constructed of mild steel shall have means provided to enable the interior surface to be inspected. An inspection cover may be provided or the top cone may be bolted to the cylindrical body. All joints should be metal to metal and may incorporate an ‘O’ ring or other seal. Inspection covers and other features should be designed that no air can be trapped when filling nor any water be retained upon draining.
- 8 An adjustment plunger, not exceeding 1% of the volume, may be fitted.
- 9 Means shall be provided for measuring the temperature of the measure and its contents.

10 The volume of the neck shall be not less than 1% of the nominal volume of the measure. A clear glass sight tube and graduated scale shall be arranged parallel to the vertical neck, the graduated scale being in the same plane as the vertical axis of the sight glass tube and within 2 mm of its surface.

11 The diameter of the neck shall be such that 1 cm on the scale represents between 0.01% and 0.05% of the nominal volume of the measure.

12 The graduated scale shall be made of brass or some other rigid and durable material and shall be capable of being locked in position and sealed. It shall be marked with permanent horizontal scale marks of a uniform width.

The scale may be graduated in gallons or litres.

The scale shall have a central scale mark corresponding to the nominal volume extending across the full width of the scale and denominated in full.

The scale shall be graduated on either side of the central scale mark to represent  $\pm 0.5\%$  of the nominal volume.

Major scale marks, extending across one half of the scale width shall represent 0.05% of the nominal volume and shall be numbered.

Un-numbered minor scale marks may extend across one third of the scale width.

13 The lower datum shall be formed by a sump of the same diameter as the neck incorporating an L-shaped weir pipe of appropriate diameter and fitted with a valve.

14 Leak proof inlet and outlet valves shall be provided. A sight glass and syphon breaker of not less than 25 mm diameter shall be fitted to a hump in the outlet pipe. The lower internal level of the hump shall be above the datum weir.

## CALIBRATION

15 Prior to testing, the measure will be filled and then emptied by opening the outlet valve to allow the main flow to pass over the hump and then opening the weir valve for a set time. The drainage time will be the total time from the opening of the outlet valve to the closing of the weir valve.

The measure will then be calibrated by multiple transfer from a gravimetrically-calibrated delivery vessel (NWML 7312).

The scale will be adjusted so that the top of the central scale mark coincides with the bottom of the meniscus in the sight glass tube. The scale graduations will be calibrated by adding known volumes of liquid into the neck.

## SEALING

16 Means shall be provided for sealing to the tank the inlet and outlet valves, the scale and all other components which are capable of altering the volume.

**INSCRIPTIONS**

17 The following inscriptions shall be marked on a plate, securely fastened to the measure or its support:

- (a) the name of the local authority
- (b) the nominal capacity
- (c) the reference temperature
- (d) the total drainage time
- (e) an identification number
- (f) the manufacturer's name
- (g) the year of manufacture

**LIMITS OF ERROR**

18 The permissible limits of error in the volume of liquid contained by the measure at 20 °C shall not exceed the amount specified in Regulations made under section 4(5) of the Weights and Measures Act 1985, as shown in Table 1.

**TABLE 1****DIMENSIONS AND LIMITS OF ERROR**

Nominal capacity	Minimum neck diameter	Maximum neck diameter	Maximum weir diameter	Limits of error on capacity
100 gal 500 l	80 mm	180 mm	20 mm	) $\pm 0.02\%$ ) although scale ) is always set ) to zero
200 1000	110 mm	250 mm	20 mm	
500 2000	160 mm	360 mm	25 mm	
1000 5000	250 mm	560 mm	25 mm	

