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STATUTORY INSTRUMENTS

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1987 No. 51

**WEIGHTS AND MEASURES**

**The Weights and Measures (Local and Working Standard Capacity Measures and Testing Equipment) Regulations 1987**

<i>Made - - - -</i>	21st January 1987
<i>Laid before Parliament</i>	26th January 1987
<i>Coming into force</i>	16th February 1987

The Secretary of State, in exercise of his powers under sections 4(5) and (6), 5(9), 86(1) and 94(1) of the Weights and Measures Act 1985 (a) and of all other powers enabling him in that behalf, hereby makes the following Regulations:—

PART I

GENERAL

*Citation, commencement and revocation*

1.—(1) These Regulations may be cited as the Weights and Measures (Local and Working Standard Capacity Measures and Testing Equipment) Regulations 1987 and shall come into operation on 16th February 1987.

(2) The Weights and Measures (Local Standards: Limits of Error) Regulations 1970 (b), the Working Standards and Testing Equipment (Testing and Adjustment) Regulations 1970 (c), the Weights and Measures (Local Standards: Periods of Validity) Regulations 1979 (d), the Working Standards and Testing Equipment (Testing and Adjustment) (Amendment) Regulations 1979 (e) and the Weights and Measures (Local and Working Standard Capacity Measures) Regulations 1983 (f) are hereby revoked insofar as they relate to capacity measures and capacity testing equipment.

*Interpretation*

2.—(1) In these Regulations:—

“the Act” means the Weights and Measures Act 1985;

“discrimination threshold” means the smallest change which produces a perceptible change in the indication;

“linearity” means the horizontal band within which the graph of the meter error of a reference meter lies over the authorised range of flowrates;

“multifiller” means a device consisting of a number of calibrated measures, capable of dispensing simultaneously known quantities of water, used for the testing of capacity measures;

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(a) 1985 c.72.

(b) S.I. 1970/1710; relevant amending instrument is S.I. 1983/1654.

(c) S.I. 1970/1714.

(d) S.I. 1979/1436.

(e) S.I. 1979/1719.

(f) S.I. 1983/1654.

“reference meter” means a meter for use in testing measuring equipment used for the measurement of liquid fuel delivered from road tankers; and

“repeatability” means the ability of reference meters to indicate, under defined conditions of use, closely similar quantities on repeated measurements.

(2) The abbreviations of, and symbols for, units of measurement used in these Regulations refer to the relevant units as follows:—

Imperial System		Metric System	
fluid ounce	fl oz	millilitre	ml
pint	pt	litre	l
gallon	gal		

## PART II

### WORKING STANDARD CAPACITY MEASURES

3.—(1) Working standard capacity measures provided pursuant to section 5(1) of the Act for use by inspectors of weights and measures shall be tested by one of the following methods:—

#### *Method 1*

- (a) where the test relates to an indicated imperial measurement not exceeding 1 gal or an indicated metric measurement not exceeding 5 l, by transfer of water from an equivalent local standard capacity measure;
- (b) in any other case by transfer of water from a local standard capacity measure of maximum possible capacity in relation to the working standard used the requisite number of times;

#### *Method 2*

by pouring water of a known temperature into the measure under test, when the measure is resting on a horizontal surface—

- (a) where the nominal capacity of the measure is defined by a line, until the bottom of the meniscus coincides with the top of that line or with the top of any graduation line or tolerance mark being tested; or
- (b) where the nominal capacity of the measure is defined by its brim, until the surface water coincides with the brim;

and in either case determining the weight of the water on a suitable weighing machine (the discrimination threshold of which in grams shall not be more than one-fifth of the equivalent amount in millilitres of the appropriate limit of error set out in Schedule 1 to these Regulations) and calculating therefrom the capacity of the measure in accordance with British Standard 1797: 1968(a) or British Standard 6696: 1986(b).

(2) A working standard capacity measure shall be tested as a measure of any amount in Schedule 3 to the Act which it is designed to measure and the

- (a) Tables for use in the calibration of Volumetric Glassware, SBN 580 00129 6, published by the British Standards Institution in February 1952, and revised in April 1968.
- (b) British Standard Methods for use and testing of capacity volumetric glassware, ISBN 0 580 15076 3, published by the British Standards Institution on 28th February 1986.

accuracy of any tolerance marks adjacent to any graduation tested shall also be tested.

**4. Every working standard capacity measure—**

- (a) which is made of glass shall have been tested within 12 months before use;
- (b) which is made of metal and
  - (i) is of 50 l or less or 10 gal or less shall have been tested within 6 months before use;
  - (ii) is of more than 50 l or 10 gal shall have been tested within 24 months before use.

**PART III**

**TESTING EQUIPMENT**

*Reference meters*

**5.—(1) Reference meters shall be tested either—**

- (a) by means of a local or working standard capacity measure which is of sufficient size to hold at least one minute's delivery of the meter under test; or
- (b) by means of a weighing machine which can weigh at least one minute's delivery of the meter under test.

(2) The capacity measure or the weighing machine used to test a reference meter shall have a discrimination threshold of not less than 0.01 per cent. of the quantity delivered by the meter under test.

In a test under paragraph (1)(b) above, the density of the test liquid shall be determined to an accuracy of 0.01 per cent.

**6. A reference meter shall have been tested over the range of flowrates and liquids for which it is intended to be used within 24 months before use, and the results of the test shall be such that**

- (a) the repeatability shall be such that the range of five consecutive tests with the same liquid at the same flowrate does not exceed 0.05 per cent. of the quantity delivered on each test;
- (b) the linearity shall be such that the range of the means of any five consecutive tests with the same liquid within the flowrate range shall not exceed 0.1 per cent. of the quantity delivered on each test; and
- (c) notwithstanding the application of corrections when a reference meter is used to test meter measuring systems in accordance with the Measuring Equipment (Liquid Fuel delivered from Road Tankers) Regulations 1983 (a), the accuracy of the mean of any five consecutive tests shall not exceed 0.5 per cent. of the quantity delivered on any test.

**7. A reference meter shall have been tested at a single flowrate within 6 months before use, and the mean of five consecutive measurements at the same flowrate shall not differ by more than 0.05 per cent. of the quantity delivered on each test from the mean quantity delivered at the same flowrate with liquid of the same viscosity when the meter was last tested in accordance with Regulation 6 above.**

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(a) S.I. 1983/1390, amended by S.I. 1986/1210.

### *Multifillers*

8. Every measure in a multifiller shall be tested in the manner in which it is to be used by discharging water into a working standard capacity measure or into a container and determining the volume of water delivered on a suitable weighing machine.

9. Every multifiller shall have been tested within 6 months before use and shall have been adjusted so that the quantity delivered does not lie outside the limit of error permitted for a working standard of the same nominal capacity.

### *Burettes and pipettes*

10. Burettes and pipettes shall have been tested within 12 months before use and shall have been adjusted so that the error in volume does not exceed the limit of error permitted for a working standard of the same nominal capacity.

11. A pipette shall be tested as a measure of its maximum purported capacity, and (if applicable) as a measure of at least one amount indicated by a subdivision, by filling it to the level of the graduation, discharging it, and weighing the water discharged.

12. A burette shall be tested as a measure of its maximum purported capacity, and (if applicable) as a measure of at least two amounts indicated by subdivisions, by filling it to the level of the graduation, discharging it, and weighing the water discharged.

### *Displacement plungers*

13. A displacement plunger shall be tested by measuring either the volume or the weight of water displaced when the displacement plunger is immersed in water up to the line which indicates the nominal volume.

14. A displacement plunger shall have been tested within 12 months before use and shall have been adjusted so that the error in volume does not exceed the limit of error set out in Schedule 2 to these Regulations.

## PART IV

### WORKING STANDARD CAPACITY MEASURES AND TESTING EQUIPMENT

15.—(1) Where an inspector has reasonable cause to believe that any working standard capacity measure or testing equipment referred to in these Regulations is not accurate within the relevant limits of error, he shall test it before use.

(2) Where testing reveals an error which exceeds the relevant limit shown in Schedule 1 or 2 to these Regulations, the measure or testing equipment shall not be further used until it has been so adjusted that any error is within that limit.

## PART V

### LOCAL STANDARD CAPACITY MEASURES

#### *Prescribed limits of error*

16. The error on local standard capacity measures shall not exceed the limits of error shown in Schedule 3 to these Regulations.

*Periods of validity of certificates of fitness of local standard capacity measures*

17. The periods prescribed in the case of local standard capacity measures for the purposes of section 4(6) of the Act (which relates to periods of validity of certificates of fitness of local standards) shall be:

- (a) ten years, in the case of a capacity measure up to and including 500 ml or 1 pint;
- (b) five years, in the case of a capacity measure over 500 ml or 1 pint.

*Lucas of Chilworth*  
Parliamentary Under-Secretary of State,  
Department of Trade and Industry

21st January 1987

SCHEDULE 1

Regulations 3 and 15

WORKING STANDARD CAPACITY MEASURES AND TESTING EQUIPMENT  
(excluding proving tanks, graduated measuring cylinders, displacement plungers and reference meters)

(a) Imperial		(b) Metric	
Indicated capacity of or tolerance mark relating to—	Limit of error in millilitres	Indicated capacity of or tolerance mark relating to—	Limit of error in millilitres
¼ gill or less	0.2	1 ml or 2 ml	0.1
½ gill	0.3	5 ml or 10 ml	0.2
⅔ gill or ½ gill	0.4	20 ml or 25 ml	0.2
4 fl oz	0.5	50 ml	0.3
1 gill (5 fl oz)	0.6	100 ml	0.4
6 fl oz	0.7	125 ml	0.5
⅓ pt, 8 fl oz or ½ pt	0.8	150 ml	0.6
1 pt	1.0	175 ml	0.7
1 quart or ½ gal	2.0	200 ml or 250 ml	0.8
1 gal	5.0	500 ml	1.0
2 gal	10.0	1 l or 2 l	2.0
5 gal	20.0	2.5 l	2.5
more than 5 gal	0.1 per cent.	5 l	5.0
		10 l	10.0
		more than 10 l	0.1 per cent.

## PROVING TANKS

The permitted limit of error on proving tanks shall be 0.02 per cent. of the nominal capacity.

### GRADUATED MEASURING CYLINDERS

Nominal Capacity Metric	Limit of error
5 ml	0.2 ml
10 ml	0.2 ml
25 ml	0.25 ml
50 ml	0.5 ml
100 ml	0.8 ml
250 ml	1.5 ml
500 ml	2.0 ml
1000 ml	4.0 ml
2000 ml	8.0 ml
<b>Imperial</b>	
¼ gal	4.0 ml
½ gal	8.0 ml

## SCHEDULE 2

Regulations 14 and 15

### DISPLACEMENT PLUNGERS

Nominal volume	Limit of error
not exceeding 2 ml	0.1 ml
over 2 ml but not exceeding 25 ml	0.2 ml
over 25 ml but not exceeding 50 ml	0.3 ml
over 50 ml but not exceeding 100 ml	0.4 ml
over 100 ml but not exceeding 125 ml	0.5 ml
over 125 ml but not exceeding 150 ml	0.6 ml
over 150 ml but not exceeding 175 ml	0.7 ml
over 175 ml but not exceeding 250 ml	0.8 ml
over 250 ml but not exceeding 500 ml	1.0 ml

SCHEDULE 3

Regulation 16

LOCAL STANDARD CAPACITY MEASURES

(a) Imperial		(b) Metric	
Local Standard of—	Limit of Error	Local Standard of—	Limit of Error
1/6, 1/3 or 1/4 gill	0.12 ml	1 or 2 ml	0.04 ml
1/3 gill	0.15 ml	5 ml	0.06 ml
2/3 or 1/2 gill	0.20 ml	10 ml	0.08 ml
4 fl oz	0.25 ml	20 or 25 ml	0.12 ml
1 gill	0.30 ml	50 ml	0.15 ml
6 fl oz	0.35 ml	100 ml	0.20 ml
1/3 pt, 8 fl oz or 1/2 pt	0.4 ml	125 ml	0.25 ml
1 pt	0.5 ml	150 ml	0.30 ml
1 quart or 1/2 gal	1.0 ml	175 ml	0.35 ml
1 gal	2.5 ml	200 or 250 ml	0.4 ml
more than 1 gal	0.02 per cent. of the nominal capacity	500 ml	0.5 ml
		1 l or 2 l	1.0 ml
		2.5 l	1.2 ml
		5 l	2.5 ml
		10 l	5 ml
		more than 10 l	0.02 per cent. of the nominal capacity

## EXPLANATORY NOTE

*(This note is not part of the Regulations)*

These Regulations replace the Weights and Measures (Local Standards: Limits of Error) Regulations 1970, the Working Standards and Testing Equipment (Testing and Adjustment) Regulations 1970, the Weights and Measures (Local Standards: Periods of Validity) Regulations 1979, the Working Standards and Testing Equipment (Testing and Adjustment) (Amendment) Regulations 1979 and the Weights and Measures (Local and Working Standard Capacity Measures) Regulations 1983 insofar as they relate to local and working standard capacity measures and related testing equipment.

They prescribe the methods of testing and adjusting, and the limits of error for, working standard capacity measures and testing equipment used for measuring by inspectors of weights and measures. They also make provision for limits of error for local standard capacity measures and for the periods of validity of certificates of fitness of these local standards.

The Regulations make the following changes of substance:

- (a) working standard capacity measures used for measuring need only be tested within one year before use in the case of glass measures, six months in the case of metal measures of 50 litres, 10 gallons or less, and two years in the case of metal measures exceeding 50 litres or 10 gallons (previously at intervals of not more than six months) (Regulation 4);
- (b) the prescribed limits of error for working standards consisting of graduated measuring cylinders have been relaxed (Regulation 15(2)); and
- (c) limits of error are now prescribed for a wider range of displacement plungers up to 500 ml (previously there were errors for  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$  or 1 fluid ounce only) (Schedule 2).

Copies of British Standards (see Regulation 3(1)) can be obtained from any of the sales outlets operated by the British Standards Institution (BSI) or by post from the BSI at Linford Wood, Milton Keynes, MK14 6LE.

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