GUERNSEY STATUTORY INSTRUMENT
1991 No. 45

The Weights and Measures (Bailiwick Standard and Working Standard Capacity Measures and Testing Equipment) Regulations, 1991

Made ... ... 16th December, 1991

Laid before the States ... ... 29th January, 1992

Coming into operation ... ... 17th December, 1991

THE STATES BOARD OF EMPLOYMENT, INDUSTRY AND COMMERCE, in exercise of the powers conferred by sections 2(4), 3(6) and 61(1) of the Weights and Measures (Guernsey and Alderney) Law, 1991(a) and in exercise of all other powers enabling it in that behalf, hereby makes the following Regulations -

PART I

WORKING STANDARD CAPACITY MEASURES

1.(1) Working standard capacity measures made of glass and provided pursuant to section 3(1) of the Law for use by inspectors 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 Bailiwick standard capacity measure;

(b) in any other case, by transfer of water from a Bailiwick standard measure of maximum possible

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(a) Ordre en Conseil No. XVII of 1991.

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 of the water coincides with the brim;

and in either case determining the weight of the water on a suitable weighing machine and calculating therefrom the capacity of the measure in accordance with British Standard 1797: 1987(b) or British Standard 6696: 1986(c).

(2) Working standard capacity measures made of metal and provided pursuant to section 3(1) of the Law for use by

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(b) Tables for use in the calibration of Volumetric Glassware, ISBN O 580 15952 3, published by the British Standards Institution on 23rd December, 1987.

(c) 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.

inspectors shall, if they are proving tanks or proving tanks for water, be tested by Method 1 above or, if they are not proving tanks or proving tanks for water, either by Method 1 above or 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 of the water coincides with the brim;

and in either case determining the weight of the water on a suitable weighing machine and calculating therefrom the capacity of the measure.

(3) Subject to paragraph (4) below, a working standard capacity measure shall be tested as a measure of any amount mentioned in Part IV of Schedule 2 to the Law which it is designed to measure and the accuracy of any tolerance marks adjacent to any graduation tested shall also be tested.

(4) In the case of a working standard capacity measure an inspector may, subsequent to any initial test, limit the number of tolerance marks tested.

2. No working standard capacity measure -

(a) which is made of glass shall be used unless it has been tested within 15 months before use;

(b) which is made of metal and

(i) is of 50 l or less or 10 gal or less shall be used unless it has been tested within 15 months before use;

(ii) is of more than 50 l or 10 gal shall be used unless it has been tested within 27 months before use.

PART II

TESTING EQUIPMENT

Reference meters

3.(1) Reference meters shall be tested either -

(a) by means of a Bailiwick standard or working standard capacity measure or other approved standard 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, the repeatability of which shall be not more than 0.01 per cent of the weight of the liquid delivered by the water under test, and 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 more than 0.01 per cent of the quantity delivered by the meter under test.

(3) 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.

4. A reference meter shall not be used unless it has been tested over the range of flowrates and liquids for which it is intended to be used within 39 months before use, and unless it has been found on such testing that -

(a) 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 is such that the range of the means of any five consecutive tests with the same liquid within the flowrate range does not exceed 0.1 per cent of the quantity delivered on each test; and

(c) notwithstanding the application of prescribed corrections, when a reference meter is used to test meter measuring systems for the delivery of liquid fuel from road tankers, the relative error of the mean of any five consecutive tests does not exceed 0.5 per cent of the quantity delivered on any test.

5. A reference meter shall not be used unless it has been tested at a single flowrate within 27 months before use, and unless it has been found on such testing that the mean of the last five consecutive measurements at the same flowrate does not differ by more an 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 4 above.

Reference meters for water

6.(1) Reference meters for water shall be tested with water either -

(a) by means of a proving tank for water which is of sufficient size to hold at least 10 l or one minute's delivery of the meter under test whichever is the greater; or

(b) by means of a weighing machine, the repeatability of which shall be not more than 0.05 per cent of the weight of the water delivered by the meter under test, and which can weigh at least 10 kilograms or one minute's delivery of the meter under test whichever is the greater.

(2) The proving tank for water or the weighing machine used to test a reference meter for water shall have a discrimination threshold of not more than 0.05 per cent of the quantity delivered by the meter under test.

7. A reference meter for water shall have been tested over the range of flowrates for which it is intended to be used within 15 months before use, and the results of the test shall be such that -

(a) the range of five consecutive tests at the same flowrate does not exceed 0.5 per cent of the quantity delivered on each test;

(b) notwithstanding the application of corrections when a reference meter for water is used to test metered supplies the relative error, determined from the mean of five consecutive tests at any flowrate within the flowrate range, shall not exceed 2 per cent of the quantity delivered on any test.

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. A multifiller shall not be used unless it has been tested within 15 months before use and has 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 not be used unless they have been tested within 15 months before use and 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 using a suitable weighing machine.

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 using a suitable weighing machine.

Displacement plungers

13. A displacement plunger shall be tested either by measuring the volume or, using a suitable weighing machine, by measuring 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 not be used unless it has been tested within 15 months before use and has been adjusted so that the error in volume does not exceed the limit of error set out in Schedule 1 to these Regulations.

Differential pressure gauges

15.(1) A differential pressure gauge shall not be used unless it has been tested over the range of pressures for which it is intended to be used within 15 months before use.

(2) The error on a differential pressure gauge shall not exceed the limits of error shown in Schedule 2 to these Regulations.

Piston provers

16.(1) A piston prover shall not be used unless it has been tested over its full working range within 15 months before use.

(2) The error on a piston prover shall not exceed the limits of error shown in Schedule 2 to these Regulations.

PART III

WORKING STANDARD CAPACITY MEASURES AND TESTING EQUIPMENT

17.(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 limit of error shown in Schedules 1,2 or 3 to these Regulations, he shall test it before use.

(2) Where testing reveals an error which exceeds the said limit, the measure or testing equipment shall not be further used until it has been so adjusted that any error is within that limit.

PART IV

BAILIWICK STANDARD CAPACITY MEASURES

Prescribed limits of error

18. The error on Bailiwick standard capacity measures shall not exceed the limits shown in Schedule 4 to these Regulations.

Periods of validity of certificates of fitness of Bailiwick standard capacity measures

19. The periods of validity of a certificate of fitness for a Bailiwick standard capacity measure shall be the periods specified below running in each case from the date of issue of the certificate in question -

(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.

PART V

GENERAL

Interpretation

20.(1) In these Regulations -

"differential pressure gauge" means an instrument used to determine the pressure loss across either a cold-water meter or a reference meter for water;

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

"the Law" means the Weights and Measures (Guernsey and Alderney) Law, 1991;

"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;

"piston prover" means a device which can deliver or accept water in quantities determined by the displacement of a piston in a cylinder;

"proving tank" does not include a proving tank for water;

"proving tank for water" means a Bailiwick standard or working standard capacity measure which is used solely with water to test cold-water meters or reference meters for water;

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

"reference meter for water" means a meter for use in testing a metered cold potable water supply;

"repeatability" means the ability of weighing or measuring equipment to indicate, under defined conditions of use, closely similar quantities on repeated measurings, expressed as 95 per cent confidence interval;

"suitable weighing machine" means a weighing machine having a discrimination threshold and a repeatability in grams not exceeding one fifth of the limit of error expressed in millilitres of the standard or equipment it is being used to test; and

"95 per cent confidence interval" means the range of values within which the true value may be expected to lie with 0.95 level of probability.

(2) The abbreviations of, and symbols for, units of measurement used in these Regulations refer to the following units -

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

(3) The Interpretation (Guernsey) Law, 1948**(d)** applies to the interpretation of these Regulations as if they were an enactment.

(d) Ordre en Conseil Vol. XIII, p. 355.

Citation

21. These Regulations may be cited as the Weights and Measures (Bailiwick Standard and Working Standard Capacity Measures and Testing Equipment) Regulations, 1991.

Commencement

22. These Regulations shall come into operation on 17th December, 1991.

Dated 16th December, 1991.

DAVID EVANS
President of the
States Board of Employment, Industry and Commerce.

Regulations 14 and 17

SCHEDULE 1

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

Regulations 15,16 and 17

SCHEDULE 2

DIFFERENTIAL PRESSURE GAUGES

The permitted limit of error on differential pressure gauges shall be 2.5 per cent of the nominal pressure differential.

PISTON PROVERS

The permitted limit of error on piston provers shall be 0.1 per cent of the nominal quantity delivered or accepted.

Regulation 17

SCHEDULE 3

WORKING STANDARD CAPACITY MEASURES AND TESTING EQUIPMENT

(excluding proving tanks, proving tanks for water, graduated measuring cylinders, displacement plungers, reference meters, reference meters for water, differential pressure gauges and piston provers).

(a) Imperial		(b) Metric	
Indicated capacity of or tolerance mark relating to -	Limit of error	Indicated capacity of or tolerance mark relating to -	Limit of error
¼ gill or less	0.2 ml	1 ml or 2 ml	0.1 ml
1/3 gill	0.3 ml	5 ml or 10 ml	0.2 ml
2/5 gill or ½ gill	0.4 ml	20 ml or 25 ml	0.2 ml
4 fl oz	0.5 ml	50ml	0.3 ml
1 gill (5fl oz)	0.6 ml	100 ml	0.4 ml
6 fl oz	0.7 ml	125 ml	0.5 ml
1/3 pt, 8 fl oz or ½ pt	0.8 ml	150 ml	0.6 ml
1 pt	1.0 ml	175 ml	0.7 ml
1 quart or ½ gal	2.0 ml	200 ml or 250 ml	0.8 ml
1 gal	5.0 ml	500 ml	1.0 ml
2 gal	10.0 ml	1 l or 2 l	2.0 ml
3 gal	15.0 ml	2.5 l	2.5 ml
4 gal	20.0 ml	5 l	5.0 ml
5 gal	20.0 ml	10 l	10.0 ml
more than 5 gal	0.1 per cent	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.

PROVING TANKS FOR WATER

The permitted limit of error on proving tanks for water shall be 0.1 per cent of the nominal capacity.

GRADUATED MEASURING CYLINDERS

Nominal Capacity	Limit of error
Metric	
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
Imperial	
¼ gal	4.0 ml
½ gal	8.0 ml

Regulation 18

SCHEDULE 4

BAILIWICK STANDARD CAPACITY MEASURES

(excluding proving tanks and proving tanks for water)

(a) Imperial		(b) Metric	
Bailiwick Standard of -	Limit of Error	Bailiwick Standard of -	Limit of Error
1/6,1/5 or ¼ gill	0.12 ml	1 or 2 ml	0.04 ml
1/3 gill	0.15 ml	5 ml	0.06 ml
2/5 or ½ 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 ½ pt	0.4 ml	125 ml	0.25 ml
1 pt	0.5 ml	150 ml	0.30 ml
1 quart or ½ 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

PROVING TANKS

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

PROVING TANKS FOR WATER

The permitted limit of error on proving tanks for water shall be 0.1 per cent of the nominal capacity.

EXPLANATORY NOTE

(This is not part of the Regulations)

These Regulations 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 Bailiwick standard capacity measures and for the periods of validity of certificates of fitness of those standards.