



NATIONAL STANDARDS COMMISSION

WEIGHTS & MEASURES (PATTERNS OF INSTRUMENTS) REGULATIONS

REGULATION 9

CERTIFICATE OF APPROVAL No 3/0

This to certify that an approval has been granted by the Commission that the pattern and variants of

Masses of 1 mg to 20 kg

are suitable for use for trade.

The approval of the pattern and variants is subject to review on or after 1/1/87.

Certificates of Approval No 3/0 dated 6/9/71 and 3/0/1 dated 6/3/72 are hereby cancelled.

Signed

Executive Director

Descriptive Advice

Pattern: approved 11/12/81

. Masses of 1 mg to 20 kg

Variants: approved 11/12/81

1. Metric carat masses.*
2. Special industrial masses.

Technical Schedule No 3/0 dated 2/2/82 describes the pattern and variants 1 and 2.

Filing Advice

Certificates of Approval Nos 3/0 and 3/0/1 dated 6/9/71 and 6/3/72 are superseded by this Certificate and may be destroyed.

* The use of metric carat masses is deprecated by the General Conference of Weights and Measures (convened by the International Bureau of Weights and Measures); a replacement Table, in SI units (grams) and of increased accuracy, is under consideration by the National Standards Commission.



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 3/0

1. Pattern: Masses of 1 mg to 20 kg

1.1 Description of Pattern

1.1.1 Nominal Values

The masses shall be limited to the following values:

1, 2, 5, 10, 20, 50, 100, 200, 500 mg,
1, 2, 5, 10, 20, 50, 100, 200, 500 g,
1, 2, 5, 10, 20 kg.

1.1.2 Construction

1.1.2.1 Material

Apart from lead inserted for adjustment and stamping, masses shall be made of iron, brass, gun-metal, bronze, non-magnetic stainless steel, nickel-silver, platinum or aluminium, provided masses of less than 100 g shall not be made of iron and masses of less than 50 mg for use in pharmaceutical dispensing shall be made of aluminium.

Masses shall not be composed of two or more different un-alloyed metals, apart from lead for adjustment and stamping and hard adherent coatings of nickel, chromium or zinc.

1.1.2.2 Finish

Every mass shall be clean and free from corrosion, shall be smooth on all surfaces and shall have no flaws. Every iron mass shall be painted, black-leaded or protected by sherardizing or galvanizing.

Masses shall not have a split ring or other removable parts.

Masses may be plated with a coating of nickel, chromium or zinc.

1.1.2.3 Shape

The masses shall be in one single piece and constructed in accordance with the shapes specified in Table 1.

The dimensions for rectangular iron masses are shown in Figure 1.

For circular-cylindrical masses with handles or knobs, the diameter of the knob shall not be more than 90% of the diameter of the mass.

1.1.3 Adjusting Hole

1.1.3.1

Masses from 50 g to 20 kg shall have an adjusting hole; masses less than 50 g shall be solid without an adjusting hole.

No mass may have more than one adjusting hole, or any hole in the base other than an adjusting hole.

1.1.3.2

The adjusting holes in iron masses shall be rectangular or circular, and in non-iron masses shall be circular; the holes shall not exceed the dimensions shown in Table 2.

1.1.3.3

The adjusting hole shall be in the base of the mass and shall not extend to the top face; the hole shall be under cut and have well-defined edges.

1.1.3.4

Adjustment of the mass shall be carried out by plugging the adjusting hole with lead, set firmly and securely below the surface, but not so as to render stamping impracticable or reading of the verification mark difficult. The lead shall be free from flakes or layers, without any fringe around the walls of the hole, and shall have a clean flat surface. The lead shall have a minimum thickness of 1.5 mm in 50 g and 100 g masses and 3 mm in masses of 200 g and over.

1.1.4 Marking

1.1.4.1

Every mass greater than 500 mg shall be clearly and permanently marked with its value and unit symbol. Where the height of the letters and digits is not specified, it shall be proportional to the size of the mass; for rectangular iron masses, the height is given in Figure 1.

Masses of 500 mg and less may have the unit symbol omitted.

Only the following unit symbols shall be used:

kilogram	kg
gram	g
milligram	mg

1.1.4.2

The name of the manufacturer, if marked on a mass, shall be in letters not exceeding half the size of the letters indicating the denomination. Masses shall not bear a trade or other mark which could be mistaken for either the denomination or the verification mark.

1.1.4.3

Masses intended for use for pharmaceutical dispensing or for weighing precious metals shall be marked "A".

1.1.5 Verification Mark

The lead adjustment shall be sealed by the application of a verification mark to the lead surface. Where no lead adjustment is provided the verification mark shall be applied to the metal, or a certificate shall be issued.

1.1.6 Maximum Permissible Errors

The maximum permissible errors for masses are listed in Table 3.

2. Variant 1

Metric carat masses of 0.005 CM to 500 CM.

2.1 Description of Variant 1

Metric carat masses shall comply with the pattern except in the following respects:

2.1.1 Nominal Values

They shall be limited to the following values:

0.005,	0.01,	0.02,	0.05 CM
	0.1,	0.2,	0.5 CM
	1,	2,	5 CM
	10,	20,	50 CM
	100,	200,	500 CM

2.1.2 Materials of Construction

Metric carat masses of less than 5 CM shall be made of aluminium.

2.1.3 Shape

Metric carat masses of 5 CM and over shall be circular-cylindrical with knobs; masses of less than 5 CM shall be flat sheet.

2.1.4 Adjusting Hole

They shall not have an adjusting hole.

2.1.5 Markings

Metric carat masses of 5 CM or greater shall be clearly and permanently marked with their value and the symbol CM; the symbol may be omitted on masses of less than 5 CM.

2.1.6 Maximum Permissible Errors

Maximum permissible errors are given in Table 4.

3. Variant 2

Masses of 20 g to 20 kg for special industrial purposes.

3.1 Description of Variant 2

Special industrial masses shall comply with the pattern except in the following respects:

3.1.1 Nominal Values

They may be of any value from 20 g to 20 kg to suit the purpose for which they are to be used.

3.1.2 Materials of Construction

Apart from lead inserted for adjustment and stamping, special industrial masses shall be made of iron, brass, bronze, gun-metal or non-magnetic stainless steel provided, masses of less than 2 kg shall not be made of iron.

3.1.3 Shape

They shall be of a shape dissimilar to those described in the pattern.

3.1.4 Adjusting Hole

An adjusting hole conforming to the requirements for the nearest mass described in the pattern shall be provided.

3.1.5 Markings

They shall be marked on the top face with the words FACTORY USE ONLY or NON-RETAIL.

3.1.6 Maximum Permissible Errors

The maximum permissible errors are the same as those applicable to the nearest mass described in the pattern.

TABLE 1

Denomi- nation	Iron masses	Masses other than Iron	
20 kg 10 kg 5 kg	Rectangular (see Figure 1)	Circular- cylindrical with handles or knobs	
2 kg 1 kg 500 g 200 g 100 g	Regular Hexagonal flat or Flat-circular		
50 g 20 g 10 g 5 g 2 g 1 g		Hexagonal flat sheet	
500 mg 200 mg 100 mg 50 mg 20 mg 10 mg 5 mg 2 mg 1 mg			

Shapes for Masses

TABLE 2

Denomination	Rectangular hole		Circular hole		Minimum distance of lead below surface when new
	Length	Width	Diameter		
20 kg, 10 kg	mm 50	mm 25	mm 40		mm 10
5 kg, 2 kg	25	13	20))
1 kg, 500 g	16	13	16))
200 g	16	10	14)	5
100 g	13	8	12))
50 g	-	-	7))

Adjusting Holes

TABLE 3

Denomination	Maximum permissible error: mg		
	non-ferrous masses marked "A"	non-ferrous masses not marked "A"	iron masses
1 mg	+ 0.1	-	-
2 mg	+ 0.2	-	-
5 mg	+ 0.3	-	-
10 mg	+ 0.4	-	-
20 mg	+ 0.6	-	-
50 mg	+ 0.9	-	-
100 mg	+ 1.3	-	-
200 mg	+ 2	-	-
500 mg	+ 3	-	-
1 g	+ 4	+ 60	-
2 g	+ 5.5	+ 60	-
5 g	+ 9	+ 60	-
10 g	+ 12.5	+ 120	-
20 g	+ 18	+ 120	-
50 g	+ 28	+ 120	-
100 g	+ 40	+ 120	+ 240
200 g	+ 60	+ 170	+ 340
500 g	+ 90	+ 270	+ 540
1 kg	+ 130	+ 380	+ 760
2 kg	+ 220	+ 650	+ 1300
5 kg	+ 280	+ 850	+ 1700
10 kg	+ 400	+ 1200	+ 2400
20 kg	+ 560	+ 1700	+ 3400

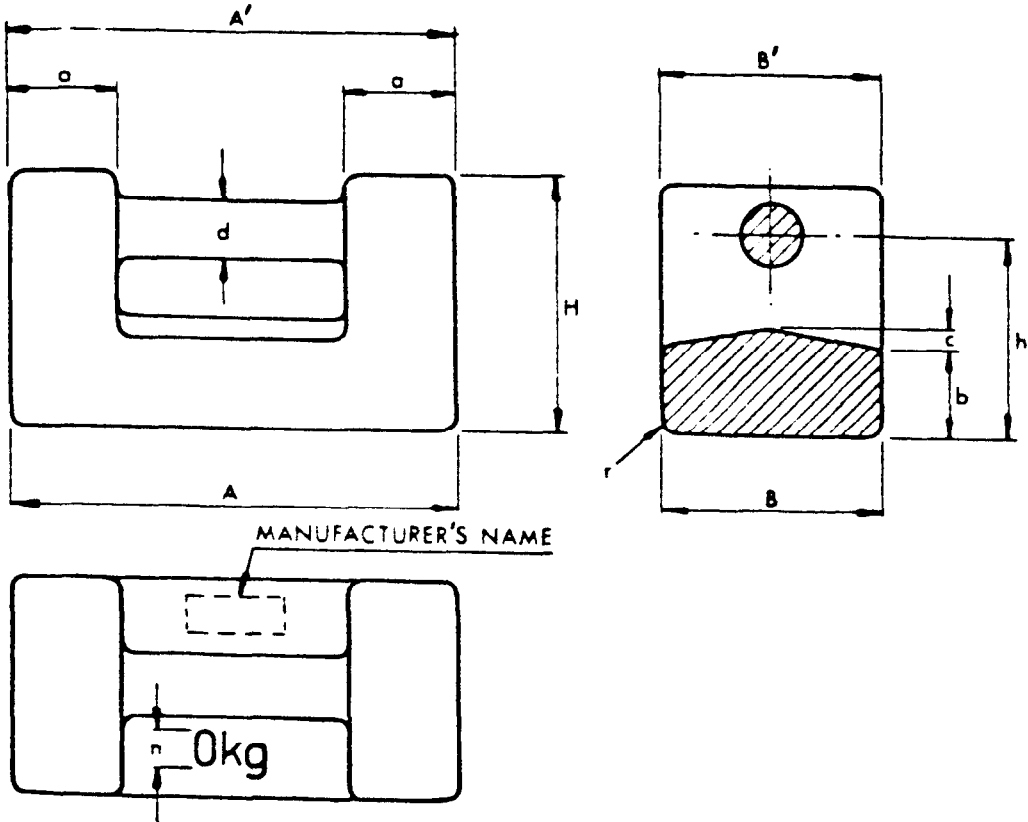
Maximum Permissible Errors for Masses

TABLE 4

Denomination CM	Maximum permissible error mg
0.005	+ 0.1
0.01	+ 0.1
0.02	+ 0.1
0.05	+ 0.1
0.1	+ 0.1
0.2	+ 0.15
0.5	+ 0.2
1	+ 0.2
2	+ 0.3
5	+ 0.5
10	+ 0.7
20	+ 1
50	+ 2
100	+ 2
200	+ 3
500	+ 5

Maximum Permissible Errors for Metric Carat Masses

FIGURE 3/0 - 1



DIMENSIONS IN mm

WEIGHT	A	A'	B	B'	H	a	b	c	h	d	r	n
5kg	150	152	75	77	84	36	30	6	66	19	5	12
10kg	190	193	95	97	109	46	38	8	84	25	6	16
20kg	230	234	115	117	139	61	52	12	109	29	8	20

DIMENSIONS A, A' & B, B' MAY BE INTERCHANGED

Dimensions for Rectangular Iron Masses