



CLASS - E1, E2, F1



Reaching Worldwide

Exclusive
STANDARD WEIGHTS
CATALOGUE
2020-21



WENSAR WEIGHING SCALES LIMITED



Maximum Permissible error for Weights (\pm mg) as per OIML R111 tolerance Table.

OIML R111 Tolerance Table (\pm mg)				
Denomination	E1	E2	F1	F2
50 kg	25	80	250	800
20 kg	10	30	100	300
10 kg	5.0	16	50	160
5 kg	2.5	8.0	25	80
2 kg	1.0	3.0	10	30
1 kg	0.5	1.6	5.0	16
500g	0.25	0.8	2.5	8.0
200 g	0.10	0.3	1.0	3.0
100 g	0.05	0.16	0.5	1.6
50 g	0.03	0.10	0.3	1.0
20 g	0.025	0.08	0.25	0.8
10 g	0.020	0.06	0.20	0.6
5 g	0.016	0.05	0.16	0.5
2 g	0.012	0.04	0.12	0.4
1 g	0.010	0.03	0.10	0.3
500 mg	0.008	0.025	0.08	0.25
200 mg	0.006	0.020	0.06	0.20
100 mg	0.005	0.016	0.05	0.16
50 mg	0.004	0.012	0.04	0.12
20 mg	0.003	0.010	0.03	0.10
10 mg	0.003	0.008	0.025	0.08
5 mg	0.003	0.006	0.020	0.06
2 mg	0.003	0.006	0.020	0.06
1 mg	0.003	0.006	0.020	0.06



The accuracy class for weights used as standards for the verification of weights or weighing instruments should be in accordance with the requirements of the relevant OIML Recommendations.

The letter “E” for Classes E1 and E2 refers to EXTRA FINE where the letter “F” for Classes F1 & F2 refers FINE

The Class F1 & F2 weight bear number indicating the nominal value, but E1 & E2 unmarked.

Duplicated weights are marked with a dot.

Weights of class F1 shall not bear any class reference.

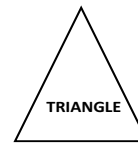
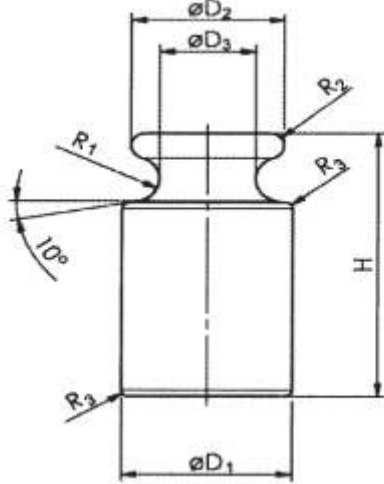
Weights equal to or greater than 1 g shall bear, by burnishing or engraving, the indication of their nominal value (not followed by the name or symbol of the unit).

Weights of class F2 equal to or greater than 1 g shall bear their reference class in the form “F” together with the indication of their nominal value.

- ✦ Our main range of Weights - 1mg to 20kg : E2 & F1,
- ✦ E1 Class weights : 1mg to 2kg
- ✦ All Class Weights 90% READY STOCK
- ✦ We can provide only OIML R111 Standards Weights
- ✦ We can despatch within 2 days (if calibration certificate not required)
- ✦ We can provide Calibration Certificate from NABL Accredited Lab @ Nominal charge
- ✦ We can also provide Calibration from NPL for E1 & E2 at extra cost.
- ✦ We can supply individual any weight F1 & E2 between 20kg to 1mg
- ✦ Re-calibration services also available at extra cost
- ✦ All sets are supplied with Standard Accessories

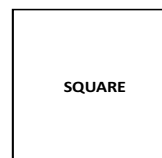


SHAPES & DIMENSIONS



1mg,
10mg
100mg

Triangle
1 segment



2mg
20mg
200mg

Square
2 segments



5mg
50mg
500mg

Pentagon
5 segments

Nominal Value	D1	D2	D3	H	R1	R2	R3	O	a1	a2	b1	c	d	e	f	g	h	i	m	n	q	τ
1 g	6	5.5	3		0.9	0.5	0.5	1	without adjusting cavity													
2 g	6	5.5	3		0.9	0.5	0.5	1														
5 g	8	7	4.5		1.25	0.7	0.5	1														
10 g	10	9	6		1.5	0.8	0.5	1														
20 g	13	11.5	7.5		1.8	1	0.5	1.5														
50 g	18	16	10		2.5	1.5	1	2														
				DEPENDENT ON MATERIAL																		
20 g	13	11.5	7.5		1.8	1	0.5	1.5	3.5	3	18	5.5	2.5	6.5	1.5	1	9	5	1	5	1	
50 g	18	16	10		2.5	1.5	1	2	5.5	4.5	25	7.5	3.5	9	2	1	10	5	1.5	7	1.5	
100 g	22	20	13		3.5	2	1	2	5.5	4.5	30	7.5	3.5	9	2	1	10	5	1.5	7	1.5	
200 g	28	25	16		4	2.25	1.5	3.2	6.9	7	40	10.5	4.5	12	2.5	1.5	15	8	2	10	2	
500 g	38	34	22		5.5	3	1.5	3.2	6.9	7	50	10.5	4.5	12	2.5	1.5	15	8	2	10	2	
1 kg	48	43	27		7	4	2	5	12.4	12	65	18.5	7	20	4	2.5	20	13	3	18	3	
2 kg	60	54	36		9	5	2	5	12.4	12	80	18.5	7	20	4	2.5	20	13	3	18	3	
5 kg	80	72	46		12	6.5	2	10	18.4	18	120	24.5	8	26.5	4	2.5	35	18	4	24	3	
10 kg	100	90	58		15	8.5	3	10	18.4	18	160	24.5	8	26.5	4	2.5	35	18	4	24	3	
20 kg	128	112	74	18	11	3	10	18.4	18	160	24.5	8	26.5	4	2.5	35	18	4	24	3		



Limits of polarization

The magnetization, M , expressed in terms of the polarization, $\mu_0 M$, should not exceed the values given

Weight Class	E1	E2	F1	F2
Maximum Polarization $\mu_0 M$, (μT)	2.5	8	25	80

Limits of magnetic susceptibility

Weight Class	E1	E2	F1	F2
$m \leq 1g$	0.25	0.9	10	-
$2g \leq m \leq 10g$	0.06	0.18	0.7	4
$20g \leq m$	0.02	0.07	0.2	0.8

Maximum value Surface Roughness

Weight Class	E1	E2	F1	F2
R_z (μm)	0.5	1	2	5
R_a (μm)	0.1	0.2	0.4	1

Ambient Temperature during the calibration

Weight Class	Temperature change during calibration
E1	$\pm 0.3^\circ C$ per hour with a maximum of $\pm 0.5^\circ C$ per 12 hours
E2	$\pm 0.7^\circ C$ per hour with a maximum of $\pm 1^\circ C$ per 12 hours
F1	$\pm 1.5^\circ C$ per hour with a maximum of $\pm 2^\circ C$ per 12 hours
F2	$\pm 2^\circ C$ per hour with a maximum of $\pm 3.5^\circ C$ per 12 hours

Humidity

Weight Class	Range of relative humidity (hr) of the air (3)
E1	40 % to 60 % with a maximum of ± 5 % per 4 hours
E2	40 % to 60 % with a maximum of ± 10 % per 4 hours
F1, F2	40 % to 60 % with a maximum of ± 15 % per 4 hours



Nominal Value	Size (Φ x h) mm
1g	6 x 6 mm
2g	6 x 10.8 mm
5g	8 x 14 mm
10g	10 x 18.7 mm
20g	13 x 22.5 mm
50g	18 x 30 mm
100g	22 x 38.5 mm
200g	28 x 46.5 mm
500g	38 x 64.5 mm
1kg	48 x 81.5 mm
2kg	60 x 102.5 mm
5kg	80 x 143 mm
10kg	100 x 182.5 mm
20kg	128 x 225 mm

Optimal Use in	Resolution ratio
E1	> 500000d
E2	> 100000d < 500000d
F1	> 30000d < 100000d
F1	> 6000d < 30000d

Nominal Value	Pcs. / Set	Total Weight Measuring range
1mg to 500mg	12 pcs. / set	1.11g
1mg to 200g	23 pcs. / set	611.11g
1mg to 500g	24 pcs. / set	1111.11g
1mg to 1kg	25 pcs. / set	2111.11g
1mg to 2kg	27 pcs. / set	6111.11g
1kg to 5kg	4 pcs. / set	10000.00g
1mg to 5kg	28 pcs. / set	11111.11g

Accuracy differentiate between E1, E2, F1 Class Weights (Example 100g)
 Maximum Permissible error for 100g Weight (± mg)

E1 - 100g ± 0.05mg = 100.0000**5**g to 99.9999**5**g

E2 - 100g ± 0.16mg = 100.000**16**g to 99.999**84**g

F1 - 100g ± 0.5mg = 100.000**50**g to 99.999**50**g

Weights Class Selection for Calibration of Weighing Scales	Capacity \ Accuracy	100 mg	10 mg	1 mg	0.1 mg	< 0.1 mg
	50g	-	M1	F2	E2	E1
100 g	-	M1	F1	E1	E1	
500 g	M1	F2	E2	-	-	
1 kg	M1	F1	E1	-	-	
5 kg	F2	E2	-	-	-	
10 kg	F1	E1	-	-	-	



THERMAL STABILIZATION

ΔT^*	Nominal Value	Class E1	Class E2	Class F1	Class F2
$\pm 5 \text{ }^\circ\text{C}$	10,20,50 kg	36	18	4	1
	1,2,5 kg	15	8	3	1
	100,200,500 g	6	4	2	0.5
	10,20,50 g	2	1	1	0.5
	<10 g	0.5			
$\pm 2 \text{ }^\circ\text{C}$	10,20,50 kg	27	10	1	0.5
	1,2,5 kg	12	5	1	0.5
	100,200,500 g	5	3	1	0.5
	<100 g	2	1		0.5
$\pm 0.5 \text{ }^\circ\text{C}$	10,20,50 kg	11	1	0.5	0.5
	1,2,5 kg	7	1	0.5	0.5
	100,200,500 g	3	1	0.5	0.5
	<100 g	1	0.5		

ΔT^* = Initial difference between weight temperature and laboratory temperature





E1

OIML Standard Weights - Class E1

SPECIFICATION	Class	E1
	Standard	OIML R111
	Material	Austenitic Stainless Steel
	Construction	Solid single piece fabrication
	Cavity	No cavity adjustment
	Density	8.00g/cm ³
	Magnetic Susceptibility	<0.005
	Intensity of polarization	< 2.5 μT
	Shape	Cylindrical with knob
	Finish	Mirror Polish
	Packing	Aluminum alloy box
	Accessories	Tweezer, Cloth, Gloves (For Sets)

Specification, colour, designs are subject to change without notice.

Our Range Class E1

E1 - 1mg to 500mg - 12pcs. E1 - 1mg to 200g - 23pcs. E1 - 1mg to 500g - 24pcs. E1 - 1mg to 1kg - 25pcs. E1 - 1mg to 2kg - 27pcs.

E1 - 20kg, E1- 10kg, E1 - 5kg, E1 - 2kg, E1 -1kg, E1 - 500g, E1 - 200g, E1 -100g, E1- 50g, E1 - 20g to 1mg.

Application

E1 Class weights are recommended for primary reference standard for calibration other reference standard and weights.

It cannot use in General Laboratory.

We can Provide Calibration Certificate from NABL Accredited Lab (Charges applicable)



E2

OIML Standard Weights - Class E2

SPECIFICATION	Class	E2
	Standard	OIML R111
	Material	316 Stainless Steel
	Construction	Solid single piece fabrication
	Cavity	No cavity adjustment
	Density	7.96g/cm ³
	Magnetic Susceptibility	<0.005
	Intensity of polarization	< 8
	Shape	Cylindrical with knob
	Finish	Mirror Polish
	Packing	Aluminum alloy box
	Accessories	Tweezer, Cloth, Gloves (For Sets)

Specification, colour, designs are subject to change without notice.

Our Range Class E2

E2 - 1mg to 500mg - 12pcs. E2 - 1mg to 200g - 23pcs. E2 - 1mg to 500g - 24pcs. E2 - 1mg to 1kg - 25pcs. E2 - 1mg to 2kg - 27pcs.

E2 - 20kg, E2- 10kg, E2 - 5kg, E2 - 2kg, E2 -1kg, E2 - 500g, E2 - 200g, E2 -100g, E2- 50g, E2 - 20g to 1mg.

Application

E2 Class weights are recommended for the calibration of micro, semi-micro & analytical balances where very high accuracy is required.

E2 Class weights also can use to calibrate F1 Class weights.

We can Provide Calibration Certificate from NABL Accredited Lab (Charges applicable)



WW - Wire Weights (mg)
SW - Sheet Weights (mg)



Wire Weights

F1

OIML Standard Weights - Class F1

SPECIFICATION	Class	F1
	Standard	OIML R111
	Material	304 Stainless Steel
	Construction	One or two pieces of same material
	Cavity	May contain adjusting cavity
	Density	7.90g/cm ³
	Magnetic Susceptibility	<0.05
	Intensity of polarization	< 25
	Shape	Cylindrical with knob
	Finish	Mirror Polish
	Packing	Aluminum alloy box
	Accessories	Tweezer (For Sets)

Specification, colour, designs are subject to change without notice.

Our Range Class F1

F1 - 1mg to 500mg - 12pcs. F1 - 1mg to 200g - 23pcs. F1 - 1mg to 500g - 24pcs. F1 - 1mg to 1kg - 25pcs. F1 - 1mg to 2kg - 27pcs.

F1 - 20kg, F1- 10kg, F1 - 5kg, F1 - 2kg, F1 -1kg, F1 - 500g, F1 - 200g, F1 -100g, F1 - 50g, F1 - 20g to 1mg.

Application

F1 Class weights are recommended for calibration High Precision, Top loading balances with readability 0.001g .

F1 Class weights also can be use calibrate F2 Class weights.

We can Provide Calibration Certificate from NABL Accredited Lab (Charges applicable)



WEIGHTS SEQUENCE

Sequence	1mg-500mg	1mg-100g	1mg-200g	1mg-500g	1mg-1kg	1mg-2kg	1mg-5kg	1mg-10kg	1kg-5kg
1 mg	1	1	1	1	1	1	1	1	.....
2 mg	2	2	2	2	2	2	2	2	.....
5 mg	1	1	1	1	1	1	1	1	.....
10 mg	1	1	1	1	1	1	1	1	.....
20 mg	2	2	2	2	2	2	2	2	.....
50 mg	1	1	1	1	1	1	1	1	.....
100 mg	1	1	1	1	1	1	1	1	.....
200 mg	2	2	2	2	2	2	2	2	.....
500 mg	1	1	1	1	1	1	1	1	.....
1 g	.....	1	1	1	1	1	1	1	.....
2 g	.....	2	2	2	2	2	2	2	.....
5 g	.....	1	1	1	1	1	1	1	.....
10 g	.....	1	1	1	1	1	1	1	.....
20 g	.....	2	2	2	2	2	2	2	.....
50 g	.....	1	1	1	1	1	1	1	.....
100 g	.....	1	1	1	1	1	1	1	.....
200 g	.....	.....	2	2	2	2	2	2	.....
500 g	.....	.....	.....	1	1	1	1	1	.....
1 kg	.....	.....	.....	.....	1	1	1	1	1
2 kg	.....	.....	.....	.....	.....	2	2	2	2
5 kg	.....	.....	.....	.....	.....	.....	1	1	1
10 kg	.....	.....	.....	.....	.....	.....	.....	1	.....
20 kg	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	12	21	23	24	25	27	28	29	4



WEIGHTS HANDLING Safety Precautions

Frequency of Use, Care, Handling and environmental condition all play a major role in long term stability of Weights

- ✦ Please be very careful after receive the parcel of weights to open its packing
- ✦ Store in cupboard for protect from dust and atmospheric pollution by glass covers
- ✦ When not in use weights should be also store under cover to keep them as free from contamination as possible
- ✦ Weights should be used in extremely stable environment
- ✦ Never put weight on any surface
- ✦ Never touch the weights with ware hand, Always use with gloves, lifter, tweezers to handle the weights
- ✦ After use keep Weights in the Original Packing Box
- ✦ One set of weights should not be mix with other sets
- ✦ Jingles or falling down is strictly forbidden, in avoid of any scratch or jingle
- ✦ No touch any erosive matters
- ✦ Proper handling method must be used to ensure that the weight is not damaged in use
- ✦ Always weights should be kept properly and carefully
- ✦ If well handled under ideal conditions weights no need to clean.
- ✦ Weight of less than 10mg nominal mass should not be cleaned.
- ✦ If necessary clean according the class and its proper process
- ✦ After cleaning all weights should be allowed to stabilize.
- ✦ When you send weights for calibration / re-calibration weights set must be covered packed in large container or cartons to protect weights and weight case
- ✦ Heavy Weights 10kg & 20kg should be handle with suitable lifters



Our Range of
Weighing Balance (Part I Catalogue)

 <p>Semi Micro Balance</p>	 <p>Analytical Balance-0.1mg</p>	 <p>Analytical Balance-Economic</p>	 <p>Moisture Analyzer - 1mg</p>
 <p>Moisture Analyzer - 0.1mg</p>	 <p>High Precision Balance - 1mg</p>	 <p>High Precision Balance - 10mg</p>	 <p>Precision Balance - PGB 200</p>
 <p>Precision Balance - PGB 220</p>	 <p>PGB 600 / 0.01g</p>	 <p>PGB 610 / 0.01g</p>	 <p>PGB 630 / 0.01g</p>
 <p>3000g / 0.01g</p>	 <p>PGB 3010 / 6100</p>	 <p>20kg / 0.1g</p>	 <p>Platform Balance</p>
 <p>Density Determination Kit</p>	 <p>Printer</p>	 <p>OCS-5T & 10T 10tonne / 5kg 5tonne / 2kg</p>	 <p>OCS-1T, 20T & 30T</p>



Our Range of
Scientific Instruments (Part II Catalogue)



UV-VIS. DOUBLE BEAM



UV- VIS. SINGLE BEAM
Professional



VISIBLE - SINGLE BEAM



ULTRASONIC CLEANER



DIGITAL
AUTOMATIC POLARIMETER



REFRIGERATED
CIRCULATING BATH



GRADIENT THERMAL CYCLER PCR



Digital Water Bath



PH METER - 5 POINT



CONDUTIVITY METER



MULTIPARAMETER



ION METER - 5 POINT



CERAMIC HOTPLATE



ABBE REFRACTOMETER



TOUCH SCREEN
REFRACTOMETER



VORTEX MIXER



ICE FLAKER



DRY BATH INCUBATOR



PROBE SONICATOR



ROTATIONAL VISCOMETER



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CHENNAI

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