

Quality And Accreditation Institute

Centre for International Accreditation

(formerly Centre for Laboratory Accreditation)



Certificate of Accreditation

Elutech Laboratory and Calibration Services

Plot No. 1, Bajrang Vihar-9, New Loha Mandi Road, Macheda,
Jaipur- 302013, Rajasthan, India

has been assessed and accredited in accordance with the Standard
ISO/IEC 17025:2017

“General Requirements for the Competence of Testing and Calibration Laboratories”
In the field of
Testing

This certificate remains valid for the Scope of Accreditation as specified
in the annexure subject to continued compliance to the above standard &
any other requirements specified by QAI.



QAI/CIA/TL/2024/0059

(Date of First Accreditation: 12 June 2024- 11 June 2026)

Valid from: 12 June 2026

Valid until: 11 June 2028

Dr. Bhupendra Kumar Rana
Chief Executive Officer

Prof. Vikram Kumar
Chair, CIA



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Chemical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
1.	Marine Plywood/ Plywood for General Purposes / Plywood for Concrete Shuttering Work/ Structural Plywood/	Retention of Preservative (Boron)	IS 2753(P-1): 1991 RA:2020
2.		Retention of Preservative (Chromium)	IS 2753(P-1): 1991 RA:2020
3.		Retention of Preservative (Copper)	IS 2753(P-1): 1991 RA:2020
4.		Retention of Preservative (Fuel Oil & Creosote)	IS 2753(P-1): 1991 RA:2020
5.		Retention of Preservative (Zinc)	IS 2753(P-1): 1991 RA:2020
6.		Retention of Preservative (Copper)	IS 2753(P-2): 2014 RA:2019
7.		Retention of Preservative (Arsenic)	IS 2753(P-1): 1991 RA:2020
8.	Block Board	Spot Test After cutting entire cross section area for the width of block board shall show through and through penetration of preservative chemical.	IS 1659: 2004 RA:2019
9.	Medium Density Fibre Boards / Particle Boards / Prelaminated Medium Density Fibre Board / Prelaminated Particle Boards / Wood Products	Formaldehyde Content	IS 13745: 2020 RA:2020

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	Wood and Wood Products		
10.	Synthetic resin adhesives for plywood (Phenolic and Amino plastic)- Specification (Second Revision)	Acidity and Alkalinity (Ph value) IS 848 (Annex-B)	IS 848 :2006 & 2025
11.	Marine Plywood (IS 710:2024)	Formaldehyde Content	IS 13745: 2020 RA:2020
12.	Plywood for Concrete Shuttering Work (IS 4990:2024)	Formaldehyde Content	IS 13745: 2020 RA:2020
13.	Plywood for General Purposes	Formaldehyde Content	IS 13745: 2020 RA:2020



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
1.	Block Board	Length	IS 1659: 2004 RA:2019
2.		Width	IS 1659: 2004 RA:2019
3.		Thickness	IS 1659: 2004 RA:2019
4.		Edge Straightness	IS 1659: 2004 RA:2019
5.		Squareness	IS 1659: 2004 RA:2019
6.		Adhesion of Plies The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1659: 2004 RA:2019
7.		Mycological test The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1659: 2004 RA:2019
8.		Water Resistance test The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1659: 2004 RA:2019
9.		Modulus of Rupture	IS 1659: 2004 RA:2019
10.		Modulus of Elasticity	IS 1659: 2004 RA:2019

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
11.		Dimension Change Caused by Humidity (Length, Thickness, Planeness & Delamination)	IS 1659: 2004 RA:2019
12.		Surface defect Permissible defects and Torrance on thickness shall conform to IS 303 & IS 1328 for commercial and decorative veneers respectively.	IS 1659: 2004 RA:2019
13.	Fire Retardant Plywood	Length	IS 5509: 2021
14.		Width	IS 5509: 2021
15.		Thickness	IS 5509: 2021
16.		Edge Straightness	IS 5509: 2021
17.		Squareness	IS 5509: 2021
18.		Flame Penetration	IS 1734(P-3): 1983 RA:2018
19.		Flammability	IS 1734(P-3): 1983 RA:2018
20.		Rate of burning	IS 1734(P-3): 1983 RA:2018
21.		Moisture Content	IS 1734(P-1): 1983 RA:2018
22.			Workmanship and Finish the finished plywood shall be reasonably clean to handle and free of dirt and stain

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
		other than any uniform Colour of the flame-retardant solution.	
23.		Water Resistance	IS 5509: 2021
24.		Static Bending Strength Modulus of Rupture (Along & across the Grains)	IS 1734(P-11): 1983 RA:2018
25.		Static Bending Strength Modulus of Elasticity (Along & across the Grains)	IS 1734(P-11): 1983 RA:2018
26.	Marine Plywood	Length	IS 710: 2024
27.		Width	IS 710: 2024
28.		Thickness	IS 710: 2024
29.		Edge Straightness	IS 710: 2024
30.		Squareness	IS 710: 2024
31.		Workmanship and Finish As per Cl. 7	IS 710: 2024
32.		Moisture Content	IS 1734(P-1): 1983 RA:2018
33.		Adhesion of Plies the result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1734(P-5): 1983 RA:2018



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
34.		Glue Shear Strength	IS 1734(P-4): 1983 RA:2018
35.		Mycological test The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1734(P-7): 1983 RA:2018
36.		Mycological test (Glue Shear Strength)	IS 1734(P-4): 1983 RA:2018
37.		Static Bending Strength Modulus of Rupture (Along & across the Grains)	IS 1734(P-11): 1983 RA:2018
38.		Static Bending Strength Modulus of Elasticity (Along & across the Grains)	IS 1734(P-11): 1983 RA:2018
39.		Tensile strength parallel to surface - Right angles to the grains	IS 1734(P-9): 1983RA:2018
40.		Tensile strength parallel to surface-Parallel to the grains	IS 1734(P-9): 1983 RA:2018
41.		Water resistance (Glue shear strength)	IS 1734(P-4&6): 1983 RA:2018
42.		Water resistance test (Adhesion of Plies) The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1734(P-5&6):1983 RA:2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
43.		Wet Bending Strength Modulus of Rupture (Along & across the grains)	IS 1734(P-11):1983 RA:2018
44.		Wet Bending Strength Modulus of Elasticity (Along & across the grains)	IS 1734(P-11): 1983 RA:2018
45.	Plywood for Concrete Shuttering work	Length	IS 4990: 2024
46.		Width	IS 4990: 2024
47.		Thickness	IS 4990: 2024
48.		Edge Straightness	IS 4990: 2024
49.		Squareness	IS 4990: 2024
50.		Workmanship and Finish	IS 4990: 2024
51.		Moisture Content (Cl. 8)	IS 1734(P-1): 1983RA:2018
52.		Glue Adhesion test (Adhesion of Plies) The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off	IS 1734(P-5): 1983 RA:2018
53.		Glue Adhesion test (Glue Shear Strength)	IS 1734(P-4): 1983 RA:2018
54.		Mycological test (Adhesion of Plies) The Result is judged the	IS 1734(P- 5&7): 1983 RA:2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
		relative amount of wood fiber left on the core veneer, and the area pierced off.	
55.		Mycological test (Glue Shear Strength)	IS 1734(P- 4&7): 1983 RA:2018
56.		Static Bending Strength Modulus of Rupture (along & across the grains)	IS 1734(P-11): 1983 RA:2018
57.		Static Bending Strength Modulus of Elasticity (Along & across the Grains)	IS 1734(P-11): 1983 RA:2018
58.		Tensile strength parallel to the grain Direction	IS 1734(P-9): 1983 RA:2018
59.		Tensile strength Right angle to the grain Direction	IS 1734(P-9): 1983 RA:2018
60.		Water resistance (Glue shear strength)	IS 1734(P-4&6): 1983 RA:2018
61.		Water resistance test (Adhesion of Plies) The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1734(P-5&6): 1983 RA:2018
62.		Wet Bending Strength Modulus of Rupture (along & across the grains)	IS 1734(P-11): 1983 RA:2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
63.	Plywood For General Purposes	Wet Bending Strength Modulus of Elasticity (Along & Across the Grains)	IS 1734(P-11): 1983 RA:2018
64.		Plywood with plastic coating or overlay	IS 4990: 2024
65.		Length	IS 303: 2024
66.		Width	IS 303: 2024
67.		Thickness	IS 303: 2024
68.		Edge Straightness	IS 303: 2024
69.		Squareness	IS 303: 2024
70.		Workmanship and finish the plywood board shall Be of uniform thickness within the tolerance limit specified under 8.3	IS 303: 2024
71.		Moisture Content	IS 1734(P-1): 1983 RA:2018
72.		Glue Adhesion test The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off	IS 1734(P-5): 1983 RA:2018
73.		Mycological test	IS 1734(P-7): 1983 RA:2018

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Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
		The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off	
74.		Water resistance test The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1734(P-5&6): 1983 RA:2018
75.		Static Bending Strength Modulus of Rupture (along & across the grains)	IS 1734(P-11): 1983 RA:2018
76.		Static Bending Strength Modulus of Elasticity (along & across the grains)	IS 1734(P-11): 1983 RA:2018
77.		Classification by Appearance on the basis of type of surface. (AA, AB, BB)	IS 303: 2024
78.		Quality requirement of surface and no of Defect as per Table 1 & 2	IS 303: 2024
79.	Synthetic resin adhesives for Plywood (Phenolic and Amino plastic)	Cyclic Test Visual Examination shall be carried out at the edge / surface the specimen to find out whether any delamination/	IS 848: 2025

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Wood and Wood Products		
		separation of plies have taken place	
80.		Quality of Resins Adhesive as per Cl. 5	IS 848: 2025
81.	Veneered Decorative Plywood	Requirement (Visual Defects) As per Cl. 7	IS 1328: 2025
82.		Dimensions and Tolerances (Thickness)	IS 1328: 2025
83.		Workmanship & Finish The decorative plywood shall be uniform in thickness within the tolerance limits specified in 8.4.	IS 1328: 2025
84.		Moisture Content	IS 1328: 2025 IS 1734 (part 1):1983
85.		Water resistance test The Result is judged the relative amount of wood fiber left on the core veneer, and the area pierced off.	IS 1328: 2025 IS 1734 (part 5): 1983



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
1.	Concrete Paving Blocks	General Quality All paving blocks shall be sound and free of cracks or other visual defects which interfere with the proper paving of the unit or impair the strength or performance of the pavement paved with the paving blocks. When paving blocks with false joints, surface reliefs or projections are supplied, the same shall be specified. Also, the surface features shall be well formed and be devoid of any defects	IS 15658:2021(All Grades M-30, M-35, M-40, M-50, M-55) (Cl. 7.1.1)
2.		Visual Inspection Any visual defects of paving blocks, including cracks and flaking, shall be recorded by observing the paved blocks from a distance of approximately 2 m from each edge of the paved area.	IS 15658:2021(Cl.7.1.2)
3.		Color and texture The color and texture	IS 15658:2021 (Cl.7.1.3)

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Building, Infrastructure and Construction Materials		
		of the pigmented paving blocks shall be matched with the standard specimens, as mutually agreed between manufacturer and the purchaser	
4.		Spacer Nibs	IS 15658:2021 (Cl.3.20)
5.		Dimensions and Tolerances	IS 15658:2021 (Cl.7.2 and table 2)
6.		Higher Width (W) (Average) For thickness < 100 mm ± 2 mm, $\pm 3 \geq 100$ mm	IS 15658:2021 7.2 table 2 and Annex B
7.		Lower Width (W) (Average) For Thickness < 100 mm ± 2 mm, $\pm 3 \geq 100$ mm	IS 15658:2021 7.2 table 2 and Annex B
8.		Length (L) For Thickness < 100 mm ± 2 mm, $\pm 3 \geq 100$ mm	IS 15658:2021 7.2 table 2 and Annex B
9.		Thickness (Th.) (Average) For Thickness < 100 mm ± 3 mm, $\pm 4 \geq 100$ mm	IS 15658:2021 (Cl.7.2 and table 2)
10.		Aspect Ratio (L/Th.) (Average)	IS 15658:2021 (Cl.7.2 and table 2)
11.		Arris/ Chamfer (Width) ± 1 mm	IS 15658:2021 (Cl.7.2 and table 2)

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Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method	
	Building, Infrastructure and Construction Materials			
12.		Arris / Chamfer (Depth) ± 1 mm	IS 15658:2021 (Cl.7.2 and table 2)	
13.		Thickness of Wearing Layer	IS 15658:2021 (Cl.7.2 and table 2)	
14.		Plan Area (Asp)	IS 15658:2021 (Cl.7.2 and table 2)	
15.		Ratio of Wearing Face Area and Plan Area (Asw/Asp)	IS 15658:2021 (Cl.7.2 and table 2)	
16.		Deviation From Squareness For Thickness < 100 mm ± 2 mm, $\pm 3 \geq 100$ mm	IS 15658:2021 (Cl.7.2 and table 2)	
17.		Water Absorption	IS 15658:2021(Cl.7.3 and Table 3)	
18.		Individual	IS 15658:2021 7.3 Table 3, and Annex C	
19.		Average	IS 15658:2021 7.3 Table 3, and Annex C	
20.		Concrete Paving Blocks	Compressive strength	IS 15658:2021 (Cl.7.3 and table 3)
21.			Individual	IS 15658:2021 7.3, table 3, and Annex D
22.	Average		IS 15658:2021 7.3, table 3, and Annex D	
23.	Abrasion Resistance Dry Condition		IS 15658:2021 (Cl.7.3 and table 3)	
24.	Individual		IS 15658:2021 (Cl.7.3 and table 3)	

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Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Building, Infrastructure and Construction Materials		
25.		Average	IS 15658:2021 (Cl.7.3 and table 3)
26.		Wet Condition	IS 15658:2021 (Cl.7.3 and table 3)
27.		Individual	IS 15658:2021 (Cl.7.3 and table 3)
28.		Average	IS 15658:2021 (Cl.7.3 and table 3)
29.		Tensile Spitting Strength	IS 15658:2021
30.		Individual	IS 15658:2021 7.3 Table 3, and Annex F
31.		Average	IS 15658:2021 7.3 Table 3, and Annex F
32.		Flexural Strength	IS 15658:2021
33.		Individual	IS 15658:2021 7.3, Table 3, and Annex G
34.	Average	IS 15658:2021 7.3, Table 3, and Annex G	



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
1.	Glass ware Laboratory One-mark Volumetric flask	Classes of accuracy Class A/ Class B	IS 915: 2012
2.		Nominal Capacity (Series of Capacity) 1 - 2 - 5 - 10 - 20 - 25 – 50 - 100 - 200 - 250 – 500 – 1 000 - 2 000- 5000	IS 915: 2012 (Complete Range from 1 ml to 5000 ml)
3.		Accuracy (Maximum Permitted Errors)	IS 915: 2012 (As per Table 1 and 2 for nominal capacity 1ml to 5000ml)
4.		Construction The glass shall be as Free as possible from visible defects and reasonably free from internal stress, which would impair the performance of the flasks	IS 915: 2012
5.		Wall thickness	IS 915: 2012 (As per Table 1 and 2 for nominal capacity 1 ml to 5000 ml)
6.		Shape Body of flask may be pear shape or Conical shape	IS 915: 2012



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
7.		Neck Series k4 or k6	IS 915: 2012
8.		approximately cylindrical and there shall be no undue variation in internal diameter or wall thickness.	IS 915: 2012
9.		The axis of the neck shall be perpendicular to the plane of the axis of the base of the flask.	IS 915: 2012
10.		The top of the neck of a plain neck flask shall be finished with a strengthening flange.	IS 915: 2012
11.		Such necks, which are suitable for stoppers, shall be ground to a socket size complying with the provisions of ISO 383, and shall be selected from the k4 or k6 series of this International Standard.	IS 915: 2012
12.		There may be an enlargement of diameter in the neck below the ground joint to enable better mixing of liquid	IS 915: 2012
13.		Stopper	IS 915: 2012

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		The stopper, if provided, shall be a good fit in the flask neck and may be of glass, solid or hollow-blown, or of a suitably inert plastics material.	
14.		Dimensions The graduation line shall be placed in the lower two-thirds of the neck of the flask and shall be not less than the stated minimum distance from any point at which the neck begins to change in diameter.	IS 915: 2012
15.		Graduation line The graduation line shall be a clean, permanent, uniform line, of thickness not exceeding 0,4 mm, lying in a plane parallel to the base of the flask and completely encircling its neck.	IS 915: 2012
16.		Marking and designation a) a number indicating the nominal capacity;	IS 915: 2012

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		<p>b) the symbol "ml" or "cm³" to indicate the unit of volume;</p> <p>c) the inscription "20 °C"/27 °C to indicate the standard reference temperature.</p> <p>d) a suitable abbreviation to indicate that the flask has been adjusted to contain its indicated capacity. In order to obviate language difficulties, it is recommended that the letters "In" should be used for this purpose;</p> <p>e) the letter "A" or "B" to indicate the class of accuracy of the volumetric flask and the tolerance in accordance with table 1 or 2.</p> <p>Wide-necked flasks shall be marked with "AW" or "BW" and the tolerance;</p> <p>f) the maker's or vendor's name or mark;</p> <p>g) in the case of a flask</p>	



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		with an interchangeable stopper, the size number of the joint shall be marked on the flask; h) the glass material in accordance with 8.1. An individual identification number shall be permanently marked on each class A or AW volumetric flask	
17.		Visibility of graduation line, figures and marking All figures and markings shall be such size and form as to be clearly legible under normal conditions of use.	IS 915: 2012
18.	Laboratory Glassware (Glass Beakers)	Series of Beakers 5-10-25-50-100-250-400-500-600-800-1000-2000-3000-5000-10000 ml	From 5 ml to 5000 ml
19.		Capacity	IS 2619: 2018 (Complete Range from 5ml to 10000 ml)

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
20.		Material The glass shall be reasonably free from residual strain and from visible glass defects which might impair the safety and performance of the beaker.	IS 2619: 2018
21.		Dimensions	IS 2619: 2018 As per table 1 and 2
22.		Nominal capacity	IS 2619: 2018
23.		External diameter	IS 2619: 2018
24.		Overall height	IS 2619: 2018
25.		Wall thickness	IS 2619: 2018
26.		Radius at base Beakers having nominal capacity of 250 ml or greater shall have an external radius at the junction between the base and the side of 10 % to 20 % of the External diameter. Beakers having the junction between the base and the side	IS 2619: 2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		of 5% of the external diameter. nominal capacity less than 250 ml shall have a minimum radius	
27.		Base The design of the base shall enable the beaker to stand vertically on a plane horizontal surface without spinning or rocking.	IS 2619: 2018
28.		Spout The spout shall be shaped so that, when the beaker is filled with water, the water may be poured a regular stream clear of the side of the beaker. When the beaker is placed on a horizontal surface and filling are continued beyond its overflow capacity, the water shall first overflow from the spout and not from any other part of the brim.	IS 2619: 2018
29.		Upper edge	IS 2619: 2018



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
30.	Laboratory Glassware (Graduated Measuring Cylinders)	brim shall be finished in a plane parallel with that of the horizontal base.	IS 2619: 2018
31.		Scale Beakers may be provided with a scale, which should approximately indicate the volume contained in the beaker	IS 2619: 2018
32.		Thermal Shock Resistance Beaker shall have a thermal shock resistance of 160 deg C When tested in accordance with ISO 718	IS 2619 :2018
33.		Types tall form with spouted neck - Type 1a tall form with stoppered neck - Type 1b Squat form with spouted neck - Type 2.	IS 878: 2008 (Complete Range from 5 ml to 2000 ml)5-10-25-50-100-250- 500-1000-2000 ml
34.		Class of Accuracy Class A for the higher grade (Type 1 a and	IS 878: 2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		Type 1 b only) Class B for the lower grade.	
35.		Series of capacities and dimensions	IS 878: 2008
36.		b) Overall height	IS 878: 2008
37.		Nominal capacity	IS 878: 2008
38.		c) Distance from top of scale to top of cylinder	IS 878: 2008
39.		d) Internal height to highest graduation line	IS 878: 2008
40.		e) Sub-divisions	IS 878: 2008
41.		f) Capacity at lowest graduation line	IS 878: 2008
42.		Accuracy (Maximum Permissible Errors)	IS 878: 2008
43.		Material As free as possible visual defects	IS 878: 2008
44.		Wall thickness The cylinders shall be sufficiently robust in construction to withstand usual	IS 878: 2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		laboratory uses and the wall thickness shall show no gross departure from uniformity	
45.		Stability The Cylinder shall Stand vertically without rocking or spinning when placed on a level surface they shall not topple when placed empty (without Stopper) on a surface inclined at an angle of 15 Deg. To the horizontal.	IS 878: 2008
46.		Base The base may be integral, Glass, or may be detachable, of a suitable plastics or other material, and may be either hexagonal or of other form provided the cylinder satisfies the requirements of 9.2	IS 878: 2008
47.		Rim and spout The rim of the cylinder shall be fire-polished and shall lie in a	IS 878: 2008



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		plane at right angles to the axis of the cylinder	
48.		The spout of a Type 1a spouted cylinder shall be so formed as to enable the contents of the cylinder to be poured out in a narrow stream without spilling or running down the outside of the cylinder.	IS 878: 2008
49.		Neck and stopper A well-fitting stopper of glass or suitable inert plastics material shall be supplied. If individually ground stoppers are supplied. each stopper, and the cylinder it fits, shall be marked with an identification number.	IS 878: 2008
50.		Graduation The graduation of all cylinders within this specification shall be in accordance with ISO	IS 878: 2008

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Mechanical Testing			
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	Performance Durability/Safety Testing (Glass)		
		384:1978, Clause 9.	
51.		Figuring Figuring shall be in accordance with ISO 384:1978,10.4	IS 878: 2008
52.		Marking a) number indicating the nominal capacity.	IS 878: 2008
53.		b) the symbol "ml" or "cm ³ " to indicate the Unit of volume	IS 878: 2008
54.		c) the inscription "20°C" to indicate the standard reference temperature (But see 3.2 for a Reference temperature of 27 °C)	IS 878: 2008
55.		d) the abbreviation "In" to indicate that cylinder has been adjusted to contain its indicated capacity.	IS 878: 2008
56.		e) for Type 1a and Type 1b cylinders, the letter "A" or "S" to indicate the class of accuracy and the tolerance in accordance with Table	IS 878: 2008

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Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
57.		f) the makers or vendor's name or mark.	IS 878: 2008
58.		g) in the case of a cylinder with an interchangeable stopper (Type 1b), the size number of the joint shall be marked.	IS 878: 2008
59.		h) the type of glass material, in accordance with Clause 8.	IS 878: 2008
60.		Visibility of Graduation Lines, Figures and Markings All figures and marking shall be of such size and form as to be clearly legible under usual conditions of use.	IS 878: 2008
61.		The graduation lines. the figures and the marking shall be clearly visible and permanent Under usual conditions of use.	IS 878: 2008
62.	Laboratory Glassware (Narrow Necked Boiling Flasks)	Nominal Capacity 25-50-100-250-500-	IS 1381:2003 (Complete Range 25 ml to 5000 ml for conical flask and 50

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		1000-2000-3000-4000-5000-6000-10000	to 10000 ml for conical flask)
63.		Material shall be free from visible defects and free from internal stress which would impair the performance of the flask.	IS 1381:2003
64.		Stability The flasks shall stand vertically without rocking or spinning when placed on a level surface.	IS 1381:2003
65.		Neck The neck of the flask shall be substantially circular in cross-section and the mouth of the neck shall not be belled to any considerable distance from the top.	IS 1381:2003
66.		The top of the neck shall be suitably strengthened	IS 1381:2003
67.		Dimensions	IS 1381:2003
68.		a). Nominal volume 25-50-100-250-500-1000-	IS 1381:2003

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		2000-3000-4000--5000-6000-10000	
69.		b). External diameter of body at widest point (as per table 1 &2)	IS 1381:2003
70.		c). External diameter of neck (as per table 1 &2)	IS 1381:2003
71.		d). Overall height (as per table 1 &2)	IS 1381:2003
72.		e). Minimum wall thickness (as per table 1 &2)	IS 1381:2003
73.		Neck length	IS 1381:2003
74.		Dimensions of base	IS 1381:2003
75.		Wall thickness Substantial Local Irregularities shall be avoided	IS 1381:2003
76.		Marking a) the nominal volume of the flask,	IS 1381:2003
77.		b) the maker's or vendor's name or mark	IS 1381:2003
78.		c) each flask shall also bear an area with a	IS 1381:2003



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		surface suitable for marking with a pencil.	
79.	Laboratory Glassware (Single Volume Pipette)	Class of Accuracy A/AS/B	IS 1117: 2018
80.		Nominal Volume 0.5 to 100 ml	IS 1117: 2018 (Complete range from 0.5 ml to 100 ml)
81.		Accuracy for class A, AS, B	IS 1117: 2018
82.		Construction	IS 1117: 2018
83.		Material Single-volume pipettes shall be manufactured from glass of chemical resistance and thermal properties at least to HGB3 in accordance with ISO 719.	IS 1117: 2018
84.		shall be as free as possible from visible defects and reasonably free from internal stress.	IS 1117: 2018
85.		Shape Pipettes of 0,5 ml nominal volume shall consist of a straight tube with a jet at the lower end.	IS 1117: 2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
86.		Pipettes of nominal volume 1 ml and 2 ml may be of similar straight tube pattern or may alternatively be of bulb pattern, as described here in for the larger sizes.	IS 1117: 2018
87.		All larger pipettes shall consist of a bulb with suction and delivery tubes, the three portions being straight and coaxial.	IS 1117: 2018
88.		Bulb The main portion of the bulb shall be cylindrical, except that 1 ml and 2 ml nominal-volume pipettes may have an oval bulb if desired. The two ends of the bulb shall merge gradually into the suction and delivery tubes, the junctions being of tapered formation to facilitate drainage.	IS 1117: 2018
89.		Dimensions	IS 1117: 2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
90.		Overall length	IS 1117: 2018 Cl.7.4 (Table 2)
91.		Internal diameter at the graduation line	IS 1117: 2018 Cl.7.4 (Table 2)
92.		Length of suction tube– valid only for bulb pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 2)
93.		Length of delivery tube– valid only for bulb pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 2)
94.		External diameter of delivery tube– valid only for bulb pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 2)
95.		External diameter of bulb– valid only for bulb pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 2)
96.		External diameter of tube– valid only for straight pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 2)
97.		Dimensions	IS 1117: 2018
98.		Distance of graduation line from top of pipette	IS 1117: 2018 Cl.7.4 (Table 3)
99.		Distance from graduation line to top of bulb	IS 1117: 2018 Cl.7.4 (Table 3)

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
100.		Distance from graduation line to tip of jet– valid only for straight pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 3)
101.		Wall thickness– bulb pattern pipettes	IS 1117: 2018 Cl.7.4 (Table 3)
102.		Top of pipette The top of the single -volume pipette shall lie in a Plane at right angles to the axis of the pipette and shall be free from any blemishes which might interfere with the required accurate control by mechanical device or by the finger in setting the meniscus. The end may be lightly fire-polished or smoothly ground with a slight bevel on the outside.	IS 1117: 2018
103.		Delivery jet The lower end of the pipette shall terminate either in a delivery jet having a smooth and gradual taper or in a	IS 1117: 2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		capillary end, both without sudden constriction at the orifice which could give rise to turbulent outflow.	
104.		The end of the jet may be finished by grinding or machine tooling and may be fire polished.	IS 1117: 2018
105.		Maximum permissible difference between observed and marked delivery times	IS 1117: 2018
106.		Class A	IS 1117: 2018
107.		Class AS	IS 1117: 2018
108.		Class B	IS 1117: 2018
109.		Waiting time The waiting time for Class AS pipettes shall be 5 s and shall be marked on the pipette.	IS 1117: 2018
110.		Graduation line(s) The graduation line(s) shall be clean, permanent,	IS 1117: 2018



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		uniform line(s) completely encircling the tube, although a gap, not exceeding 10 % of the circumference, may be permitted.	
111.		Dimensions limiting the position(s) of the graduation line(s) on the pipette are included in Tables 3 and 4.	IS 1117: 2018
112.		Setting of the meniscus Setting of the meniscus Shall be performed according to ISO 384:1978, 5.4.	IS 1117: 2018
113.		Marking a) a number indicating the nominal volume and the symbol "ml" or the symbol "cm ³ " to indicate the unit in terms of which the pipette is adjusted	IS 1117: 2018
114.		b) the inscription "20 °C" to indicate the reference temperature: where the reference temperature is	IS 1117: 2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
115.		27 °C, this value shall be substituted for 20 °C c) the letters "Ex" to indicate that the pipette has been adjusted to deliver its indicated nominal volume	IS 1117: 2018
116.		d) the inscription "A", "AS" or "B" to indicate the class of accuracy for which the pipette has been adjusted	IS 1117: 2018
117.		e) the waiting time in the form: "Ex + 5 s", when appropriate	IS 1117: 2018
118.		f) the manufacturer's and/or supplier's name or mark.	IS 1117: 2018
119.		The Maximum Permissible error according to table 1 may be marked on all pipettes.	IS 1117: 2018
120.		Visibility of graduation lines, figures and inscriptions All figures, graduation lines and inscriptions be permanent, and of such size and form as to be clearly legible under	IS 1117: 2018

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		usual conditions of use.	
121.	Laboratory Glassware (Test Tube)	Classification and Designation Type1, Type II, Type III, Series	IS 2618 :2016 (Complete range from 10X75 to 24X200 mm)
122.		Nominal Size As per Table 2,	IS 2618 :2016
123.		Material Cl.4.1, Test tube shall be clear glass as free as possible from visible defects and internal stress.	IS 2618 :2016
124.		Construction and Dimensions Cl.5.1, the top (open end) of each test tube shall be smoothly finished at right angles to the axis, with either a rim or a fire- polished end The Bottom of each test tube shall be essentially hemispherical, with a wall thickness of no loss then 67% and no more than 167% of the nominal side wall thickness.	IS 2618 :2016
125.		Dimensions	IS 2618 :2016

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
126.		Length	IS 2618 :2016 Cl.5.2, Table 2
127.		External Diameter	IS 2618 :2016 Cl.5.2, Table 2
128.		Wall thickness	IS 2618 :2016 Cl.5.2, Table 2
129.		Bottom The Bottom of each test tube shall be essentially hemispherical, with a wall thickness of no less than 67% and no more than 167% of the nominal side wall thickness.	IS 2618 :2016
130.		Bottom shape Cl.5.3 The bottom of test tube shall be essentially hemispherical.	IS 2618 :2016
131.		Wall thickness of bottom	IS 2618 :2016 Cl; 5.3
132.		Markings a) manufacturers name or recognized trade mark. b) Type and Grade c) Size. d) Month and year of manufacturer	IS 2618 :2016

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		e) Batch no. A rough surface or enameled surface not less than 1 cm ² for marking purpose	
133.	Laboratory Glassware (Burettes)	Types and Classes of Accuracy Class A (subdivided into Classes A and AS) for the higher grade; Class B for the lower grade. that for which no waiting time is specified (Classes A and B); that for which a waiting time of 30 s is specified (Class AS)	IS 1997:2008 (Complete Range from 1 ml to 100 ml) 1-2-5-10-25-50-100 ml
134.		Markings Each burette shall be marked with the (Cl.11) The symbols 'cm ³ ' or 'ml' to indicate the unit in Marked which burette is graduated the inscription 27° C Marked The letter 'Ex' Marked Letter 'A', 'As' or 'B' to indicate class of accuracy Marked	IS 1997:2008 (Complete Range From 1 ml to 100 ml)
135.		e) On 'As' burettes the waiting time in the form of N.A.	IS 1997:2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
136.		Cl.11.2 If required by legal metrology, the following additional information shall be marked on Class "A" and Class "AS" burettes intended for official verification or certification. An identification Mark Marked Delivery time in second (optional) Marked An identification of the type of glass used Borosilicate (Except for Soda lime glass).	IS 1997:2008
137.		Cl.11.3Max. permissible errors as per Table 1 Not Marked by the inscription \pm ml (optional)	IS 1997:2008
138.		Class of Accuracy (Cl.5.1) Class A/ Class AS/Class B	IS 1997:2008
139.		Maximum permissible errors	IS 1997:2008 (C.6.1& Table 1)
140.		Material (Cl.7) Burettes shall be manufactured from glass of Borosilicate chemical resistance and thermal properties at least	IS 1997:2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		glass marked to HGB3 in accordance with ISO 719. Burettes shall be as free as possible from visible Satisfactory defects and shall be free from internal stress. If the burette is of Schell Bach tubing, the colored NA. The stripe on the back of the burette shall be durable and shall not exceed 40 % of the circumference of the tube	
141.		Construction (Cl.8) Burettes may supply with an auto zero Not Provided device and liquid storage reservoir in the case of the overall length of the burette N.A. when assembled to the reservoir should not exceed 1050mm.	IS 1997:2008
142.		Dimensions	IS 1997:2008 (Table 2)
143.		Top of burette (Cl.8.2) The top of each burette, if not	IS 1997:2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		provided with a filling device, shall be smoothly finished with a strengthening flange or bead which shall lie in a plane at right angles to the axis of the burette. Burettes with subdivisions of 0.05ml or less if not fitted with a filling stopcock, should preferably be finished with a cylindrical cup at the top. Larger diameter burettes may be fitted with a funnel top for special purposes. The length of tube of uniform bore between the zero-graduation line and the cup shall be at least 20mm	
144.		Stopcock and similar devices (Cl. 8.3) The stopcock shall be of good quality similar devices construction to permit smooth and precise control of outflow and to prevent rate of leakage	IS 1997:2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		<p>greater than that allowed in by 8.4. Suitable Key retained devices should be fitted</p> <p>Stopcocks of conventional design, made Satisfactory entirely of glass, shall have the barrel and key finely ground to a taper of 1:10</p> <p>Stopcock of other design whether of glass or suitably inert plastics material is permitted provided; they comply with the requirement of 8.3.1</p> <p>Stopcocks used on Class A and Class as Integral burettes should preferably be integral with stopcock the burettes and have jets that from an integral and jet part of the stopcock. if this is not the case, then for Class A and Class AS burettes each removable component shall be cleanly identified to link it to the nominal burette</p>	



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		tube size for which it is designed. For individually certified burettes, removable components shall clearly be identified (typically with a permanently inscribed or printed number) to ink them to the individual burette	
145.		Stopcock leakage A stopcock of conventional design made entirely of glass or intended for use with grease shall be tested for leakage with the burette clamped in a vertical position, the stopcock free from grease, the barrel and key wetted with water, and the burette filled initially to the zero line with water. The rate of leakage, with the key in either of the fully shut-off positions, shall not exceed one scale subdivision in the	IS 1997:2008



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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		case of Class A or Class AS burettes or two scale subdivisions in the case of Class 8 burettes, in 20 min. Other all-glass stopcocks shall be subjected to similar tests with their component parts free from grease and wet with water in addition to this test, a double-bore stopcock shall not show a rate of leakage greater than that given above when tested similarly with the burette empty, the key of the stopcock in the normal delivery position and the filling tube connected to a suitable graduated tube filled with water to a level of 250 mm above the zero line of the burette. If the stopcock is of	

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		such material that it is intended for use without grease; it shall be tested in a similar manner. The rate of leakage shall not exceed one-half of one scale subdivision in the case of Class A or Class AS burettes, or one scale subdivision in the case of Class 8 burettes, in 50 min	
146.		Delivery jet The jet shall be made from either thick-walled capillary tubing or a suitable inert plastic material and, if it forms an integral part of the burette, shall have no cavity at the join likely to trap air bubbles.	IS 1997:2008
147.		Delivery time	IS 1997:2008 (Cl.8.6) Table A-1, B-1
148.		Waiting time	IS 1997:2008 (Cl.8.7)
149.		Graduations, figuring and patterns (Cl.9) On burettes graduated according to graduation line pattern 1, the	IS 1997:2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		ends (preferably the right and end) of the short graduation lines shall lie on an imagery vertical line down the center of the front of the burette. The lines themselves should preferably extend to the left when the burette is viewed from the front in the position of normal use.	
150.		ii) On burettes graduated according to pattern II or III, the mid points of the short and medium graduation lines shall lie on an imagery vertical line down the center of the front of the burette. When the burette is viewed from the front in the position of normal use	IS 1997:2008
151.		Marking of graduation Lines (Cl.9.3) All burettes shall be marked downwards graduation lines from zero at the top, as per Table 3	IS 1997:2008

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Mechanical Testing			
Sl. No.	Product(s)/Material of Test	Specific Tests Performed	Test Method
	Performance Durability/Safety Testing (Glass)		
		Numbers shall be placed immediately above the long lines to which they refer, and slightly to the right of the end of the adjacent shorter scale-division lines. In the case of graduation pattern III, the numbers may be placed slightly to the right of the end of the line to which they refer, in such a way that an extension of the line would bisect them	
152.		Visibility of graduation line numbers and inscription (Cl.12) All figures and inscriptions shall be of such size and form as to be clearly legible under normal conditions of use. All graduations lines, numbers and inscriptions shall be clearly visible and permanent	IS 1997:2008

