

BUREAU OF INDIAN STANDARDS

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Draft Indian Standard

METHODS OF SAMPLING LABORATORY GLASSWARE

(*Second Revision*)

भारतीय मानक मसौदा

प्रयोगशाला काँच सामग्री के नमूने लेने की पद्धतियाँ

(*दूसरा पुनरीक्षण*)

ICS 71.040.20

Glass, Glassware & Laboratoryware Sectional Committee, CHD 10

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FOREWORD

(Formal clauses to be added later)

This standard was originally published in 1967, under the title of 'Methods of Sampling Laboratory Glassware and Medical Glass Instruments'. In the first revision in 1992, the Committee decided to delete the methods of sampling of medical glass instruments as medical glass instruments are being dealt by a separate sectional committee under Medical Equipment and Hospital Planning Division Council of Bureau of Indian Standards and their methods of sampling are given in the concerned product specifications. Also, the methods of sampling for accuracy, stability, volume scale and waiting time was modified. The methods of sampling for boiling test and dry heat was deleted in view of the thermal shock test given in product standards.

While reviewing the standard, the committee noted that all the referred test methods have been revised and new standards for testing of capacity and thermal shock resistance of laboratory glassware have been published by adopting ISO 4787 and ISO 718 respectively, hence in view of the above the committee decided to undertake the second revision of the standard to incorporate the above changes along with the editorial changes such as the addition of ICS No., Hindi Title, Updation of References, etc. as per the latest standard formulation practices.

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METHODS OF SAMPLING LABORATORY GLASSWARE

(Second Revision)

1 SCOPE

1.1 This standard prescribes methods of sampling laboratory glassware and criteria for conformity of laboratory glassware to the requirements prescribed in the relevant product specifications.

1.2 This standard does not cover methods of sampling thermometers and hydrometers, which have been specified in the relevant specifications for thermometers and hydrometers, respectively.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS/ISO 718: 1990	Laboratory glassware - Thermal shock and thermal shock endurance - Test methods
2303 (Part 1/Sec 1): 2021	Grading glass for alkalinity Part 1 Hydrolytic resistance of glass grains Section 2 Determination and classification of hydrolytic resistance at 98 °C (<i>third revision</i>)
2303 (Part 1/Sec 2): 2021	Grading glass for alkalinity Part 1 Hydrolytic resistance of glass grains Section 2 Determination and classification of hydrolytic resistance at 121 °C (<i>third revision</i>)
IS/ISO 4787: 2010	Laboratory glassware - Volumetric instruments - Methods for testing of capacity and for use
4905: 2015	Random sampling and randomization procedures (<i>first revision</i>)
11469: 2016	Laboratory glassware - Methods for assessing the chemical resistance of enamels used for colour coding and colour marking (<i>first revision</i>)

3 TERMINOLOGY

For the purpose of this standard, following definitions shall apply:

3.1 Item

Laboratory glassware on which inspection or testing or both shall be performed.

3.2 Lot

A collection of items of the same type, class, shape, grade, size and designation manufactured under relatively similar conditions of manufacture.

Whereas no exact instruction for the formation of lots can be given that will cover all cases, one of the following considerations may be helpful in determining the similarity of the conditions of production:

- a) From a single melt of glass,
- b) From a single production method,
- c) From a single production line,
- d) During a single production shift, and
- e) From one setting of the machine.

3.3 Sample

A collection of items selected for inspection and testing from a lot to decide about the acceptance or rejection of the lot.

3.4 Defect

Failure to meet the requirement stipulated for an item with respect to a single characteristic.

3.5 Defective

An item having one or more defects.

3.6 Percent Defective

Hundred times the ratio of the number of defectives to the total number of items.

3.7 Acceptable Quality Level (AQL)

The maximum percent defective that, for the purpose of sampling laboratory glassware, may be considered as a satisfactory process average.

NOTE — When the purchaser designates some specific value of AQL, he indicates to the supplier that his (the purchaser's) acceptance sampling plan shall accept the great majority of the lots that the manufacturer submits provided the process average level of percent defective in these lots is lesser than the designated value of AQL. Thus, AQL is the designated value of percent defective that the purchaser indicates will be accepted most of the times (approximately 8% to 99%).

3.8 Acceptance Number (*a*)

The maximum allowable number of defectives in the samples(s) for acceptance of the lot.

3.9 Rejection Number (*r*)

The minimum number of defectives in the sample(s) for the rejection of the lot.

3.10 Supplier

The party supplying the item. The 'supplier' may or may not be the actual manufacturer of the item.

3.11 Purchaser

The party purchasing the item. The term ‘purchaser’ also covers person or persons authorized in writing by the purchaser to act on his behalf for inspection of the item.

4 SCALE OF SAMPLING

4.1 The sample of items shall be selected and examined for each lot separately for ascertaining their conformity to the requirements of the relevant specification.

4.2 The number of items to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 2 and 4 of Table 1.

4.3 Method of Selection of Sample

4.3.1 The items to be selected from the lot shall be chosen at random. In order to ensure the randomness of selection, a random number table as prescribed in IS 4905 or as agreed to between the purchaser and the supplier shall be followed.

4.3.2 In case a random number table is not available, the sample may be selected from the lot in the following manner:

Starting from any item in a lot, the items shall be counted as 1, 2, 3...r and so on in one order. Every r^{th} item thus counted shall be withdrawn to constitute the sample, where r is the integral part of N/n (N and n being the lot size and corresponding sample size respectively). This procedure shall be stopped as soon as the required number of items for the sample are obtained.

4.3.3 When the items in a lot are packed in different boxes, a suitable number of boxes (not less than 10 percent of the total number in the lot subject to a minimum of 2) shall be first chosen at random. From each of the boxes so chosen, an approximately equal number of items shall be picked up from different parts of its layers so as to obtain the required number of items.

5 CRITERIA FOR CONFORMITY

5.1 Visual Characteristics, Dimensions, Capacity, Delivery Time, Graduation and Numbering, and Leakage

5.1.1 Visual Characteristics

All the items of laboratory glassware drawn according to Table 1 shall be first examined for visual characteristics like type, material, construction, workmanship and finish. Any item failing in one or more of the visual characteristics shall be considered as defective. If in the first sample the number of defective items is less than or equal to the corresponding acceptance number, the lot shall be declared as conforming to the requirements of the visual characteristics. If the number of defectives is greater than or equal to the rejection number, the lot shall be deemed as not conforming to the requirements for the visual characteristics. If the number of defectives is greater than the acceptance number but less than the rejection number, a second sample of the size equivalent to that of the first shall be taken to determine the conformity or otherwise of the lot. The number of defectives found in the first and second samples shall be combined and if the combined number of defectives is less than or equal to the corresponding acceptance number, the lot shall be declared as conforming to the requirements of visual characteristics, otherwise not.

Table 1 Scale of Sampling and Permissible Number of Defectives for Visual Characteristics, Dimensions, Capacity, Delivery Time, Graduation and Numbering, and Leakage

(Clause 4.2, 5.1.1)

Sl. No.	No. of Items in the Lot	Sample	Sample Size	Cumulative Sample Size	Acceptance Number	Rejection Number
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i.	up to 100	1 st	8	8	0	2
		2 nd	8	16	1	2
ii.	101 to 150	1 st	13	13	0	2
		2 nd	13	26	1	2
iii.	151 to 300	1 st	20	20	0	2
		2 nd	20	40	1	2
iv.	301 to 500	1 st	32	32	0	3
		2 nd	32	64	3	4
v.	501 to 1 000	1 st	50	50	1	4
		2 nd	50	100	4	5
vi.	1 001 to 3 000	1 st	80	80	2	5
		2 nd	80	160	6	7
vii.	3 001 and above	1 st	125	125	3	7
		2 nd	125	250	8	9

5.1.2 Dimensions, Capacity, Delivery Time, Graduation and Numbering, Leakage

The sample of items which have been used for ascertaining the conformity of the lot to the requirements of visual characteristics shall then be used for ascertaining the conformity of dimensions, capacity, delivery time, graduation and numbering, leakage. Whenever applicable, these items shall also be tested for accuracy, stability, volume scale and waiting time. The accuracy of volumetric laboratory glassware is checked according to IS/ISO 4787. They shall be sampled in the same manner as prescribed in 5.1.1 (using the corresponding acceptance and rejection numbers as given in Table 1).

5.1.3 In the case of those lots which have been found unsatisfactory according to 5.1.1 or 5.1.2, all the items may, depending upon the agreement between the purchaser and the supplier, be inspected for all the characteristics keeping the defective ones removed.

5.2 Limit of Alkalinity

Five items shall be selected from those already found satisfactory under 5.1 and tested for limit of alkalinity in accordance with either IS 2303: (Part 1/Sec 1) or IS 2303: (Part 1/Sec 2), individually,

depending on the level of resistance specified in the respective product specifications. In case, all the five test results satisfy the requirement of the relevant specification, the lot shall be deemed to have satisfied the alkalinity requirements, otherwise not.

5.3 Permanency of Pigment Test

Five items shall be selected at random from the lot and tested for permanency of pigment in accordance with IS 11469. In case, all the five items satisfy the requirement of the relevant specification the lot shall be deemed to have satisfied the requirement of the permanency of pigment test.

5.4 Thermal Shock Resistance Test

The lot which has also been found satisfactory in respect of alkalinity requirement, shall then be tested for thermal shock resistance test in accordance to IS/ISO 718 with requirements as specified in the relevant product specifications. The sample of items for this purpose shall be taken at random from those already drawn, in accordance with Table 2. If the number of items failing to satisfy the requirements for this characteristic is greater than or equal to the corresponding rejection number given in col 6 of Table 2, the lot shall be deemed as not conforming to the requirements in respect of this characteristic. If, however, the number of defectives is less than the corresponding rejection number, a second sample of the size equivalent to that of the first, shall be taken to determine the conformity of the lot. It may be noted that the lot shall not be accepted in any case on the basis of first sample itself. If the combined number of defectives in the two samples, is less than or equal to the corresponding acceptance number, the lot shall be declared as conforming to the requirements of these characteristics. In case the combined number of defectives is greater than the corresponding rejection number, the lot shall be deemed as not conforming to these requirements. If, however, the number of defectives lies in between the acceptance and rejection numbers, a third, fourth,, seventh sample of the size as the first and the second sample shall be taken and inspected for these requirements and the inference drawn accordingly.

NOTE — In case more items are required, they shall be selected at random from the lot. Items tested for thermal shock shall not be put into service.

Table 2 Scale of Sampling and Permissible Number of Defectives for Thermal Shock Resistance

(Clause 5.4)

Sl. No.	Sample	Sample Size	Cumulative Sample Size	Acceptance Number, (a)	Rejection Number, (r)
(1)	(2)	(3)	(4)	(5)	(6)
i.	First	5	5	*	2
ii.	Second	5	10	0	3
iii.	Third	5	15	1	3
iv.	Fourth	5	20	2	4
v.	Fifth	5	25	3	5

vi.	Sixth	5	30	4	6
vii.	Seventh	5	35	5	6

*Acceptance not permitted at this sample size.
