IS : 6932 (Part VI) - 1973
(Reaffirmed 1995)

Indian Standard

METHODS OF TESTS FOR BUILDING LIMES

PART VI DETERMINATION OF VOLUME YIELD OF QUICKLIME

(Fourth Reprint DECEMBER 1998)

UDC 691.51 : 543 [666.924.1)

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2 *February* 1974

Indian Standard

METHODS OF TESTS FOR BUILDING LIMES

PART VI DETERMINATION OF VOLUME YIELD OF QUICKLIME

0. FOREWORD

0.1 This Indian Standard (Part VI) was adopted by the Indian Standards Institution on 22 March 1973, after the draft finalized by the Building Limes Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Hitherto, methods of tests for assessing qualitative requirements of building limes were included in IS : 712-1964. For facilitating the use of these tests it has been decided to print these tests as different parts of a separate Indian Standard. This part covers determination of volume yield of quicklime.

0.3 In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard (Part VI) covers the methods of tests for determination of volume yield of quicklime.

2. GENERAL

2.1 Preparation of the Sample — The sample shall be prepared in accordance with **7.2** of IS : 712-1973†.

*Rules for rounding off numerical values (*revised*).

†Specification for building limes (*second revision*).

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

2.2 The distilled water (*see* IS : 1070-1960*) shall be used where use of water as a reagent is intended.

3. DETERMINATION ON VOLUME YIELD OF QUICKLIME

3.1 Apparatus — The Southard viscosimeter (Fig. 1) shall be used for adjusting the consistency of the putty and a vessel of the shape and dimensions shown in Fig. 2 shall be used for the determination of the volume yield. The Southard viscosimeter consists of a vertical metal cylinder 50 mm in internal diameter equipped with a tight-fitting metal piston having a working stroke of 65 mm measured from the upper open end of the cylinder. The piston can be raised, without rotation, by a coarse-thread screw having 2 threads/cm passing through a nut at the lower closed end of the cylinder and engaging

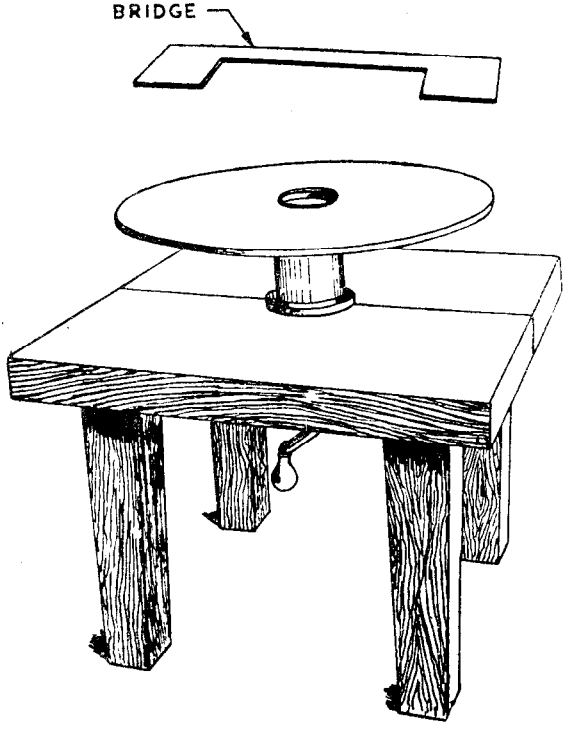


FIG. 1 SOUTHARD VISCOSIMETER

*Specification for water, distilled quality (*revised*). (Since revised).

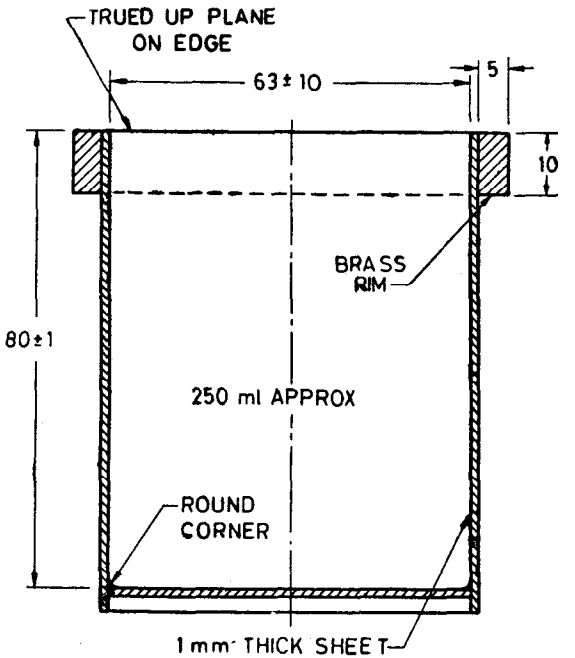
the piston on the lower side of the latter. In operation, the piston is lowered to the bottom of its stroke, the cylinder is filled carefully with the putty avoiding the inclusion of air bubbles, and the putty is struck off smooth at the top. The piston is then raised streadily by rotating the screw at the rate of one turn per second for 10 seconds, thus ejecting the contents of the cylinder vertically upwards. The degree to which the ejected cylinder of putty has slumped is then determined by measuring its present height by means of a metal bridge or similar device. For this purpose it is convenient to provide the top of the cylinder with an extended external horizontal flange with a plane surface on which the bridge may be applied. The lime putty vessel used for determining the volume yield consists of a tinned iron cylindrical pot 63 ± 1 mm in diameter with a volume of 250 ml with soldered joints and a reinforced rim of brass, the upper edge being made plane.

3.2 Preparation of Sample for Test—Sufficient lime putty for the determination of volume yield shall be prepared after conducting the test described in **2.4** of IS : 6932 (Part III)-1973* and the ends of the filter cloth shall be folded together to form a bag and tied. This shall be suspended by cord above the vessel to allow the lime putty to drain. The bag shall be pressed by hand with moderate pressure to accelerate the process. The consistency of the putty adjusted to a standard value such that a slump of 1·3 cm is obtained when tested in the Southard viscosimeter described under **3.1**. The consistency of the putty shall be adjusted by trial by adding or subtracting water and ' knocking up ' thoroughly; mixing and working the material before each trial, and repeating until the required slump is obtained with a permissible deviation of not more than 0·2 cm from the standard slump of 1·3 cm. The viscosimeter shall be washed after each examination. A small mixer of the type given in IS : 1625-1971† shall be used for the ' knocking up ' of the material before each determination, the material being passed through twice. When the putty contains more water it shall be removed by placing the putty for a short period on a clean absorbent surface.

3.3 Procedure — The volume yield of the lime putty shall be determined from the density of a portion of the putty when adjusted to the standard consistency in the manner described under **3.2**. The density of the putty shall be determined by weighing a known volume of putty, using the density vessel shown in Fig. 2, care being taken to eliminate air bubbles. Where no isothermal slaking temperature has been specified by the vendor, the duplicate slakings shall be carried out at 50 and 100°C and after the determination of volume yields on duplicate samples of putty, that putty which exhibits the higher volume yield shall be chosen for the purpose of recording. The other sample of putty shall be discarded.

*Method of tests for building limes: Part III Determination of residue on slaking of quicklime.

†Code of practice for preparation of lime mortar for use in buildings (*first revision*).



All dimensions in millimetres.

FIG. 2 LIME PUTTY DENSITY VESSEL

3.4 Report of Test Results

3.4.1 The volume shall be calculated from the formula:

$$\text{Volume yield in ml per g of quicklime} = \frac{0{\cdot}70}{d-1}$$

where

d = density of the lime putty.

3.4.2 The volume yield shall be expressed in ml/g of quicklime taken. Table 1 gives the volume of lime for different densities of lime putty for guidance.

TABLE 1 VOLUME YIELD OF QUICKLIME FOR DIFFERENT DENSITIES OF LIME PUTTY

Density *d*	Volume Yielded	Density *d*	Volume Yielded
(1)	(2)	(1)	(2)
	ml/g		ml/g
1·20	3·50	1·38	1·84
1·21	3·33	1·39	1·79
1·22	3·18	1·40	1·75
1·23	3·04	1·41	1·71
1·24	2·92	1·42	1·67
1·25	2·80	1·43	1·63
1·26	2·69	1·44	1·59
1·27	2·59	1·45	1·56
1·28	2·50	1·46	1·52
1·29	2·41	1·47	1·49
1·30	2·33	1·48	1·46
1·31	2·26	1·49	1·43
1·32	2·19	1·50	1·40
1·33	2·12	1·51	1·37
1·34	2·06	1·52	1·35
1·35	2·00	1·53	1·32
1·36	1·94	1·54	1·30
1·37	1·89	1·55	1·27

BUREAU OF INDIAN STANDARDS

Headquarters:
Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones: 323 0131, 323 3375, 323 9402
Fax : 91 11 3234062, 91 11 3239399, 91 11 3239382

Telegrams : Manaksanstha
(Common to all Offices)

	Telephone
Central Laboratory:	
Plot No. 20/9, Site IV, Sahibabad Industrial Area, Sahibabad 201010	8-77 00 32
Regional Offices:	
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	323 76 17
*Eastern : 1/14 CIT Scheme VII M, V.I.P. Road, Maniktola, CALCUTTA 700054	337 86 62
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	235 23 15
†Western : Manakalaya, E9, Behind Marol Telephone Exchange, Andheri (East), MUMBAI 400093	832 92 95
Branch Offices:	
Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001	550 13 48
‡Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE 560058	839 49 55
Gangotri Complex, 5th Floor, Bhadbhada Road, T.T. Nagar, BHOPAL 462003	55 40 21
Plot No. 62-63, Unit VI, Ganga Nagar, BHUBANESHWAR 751001	40 36 27
Kalaikathir Buildings, 670 Avinashi Road, COIMBATORE 641037	21 01 41
Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001	8-28 88 01
Savitri Complex, 116 G.T. Road, GHAZIABAD 201001	8-71 19 96
53/5 Ward No. 29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003	54 11 37
5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001	20 10 83
E-52, Chitaranjan Marg, C-Scheme, JAIPUR 302001	37 29 25
117/418 B, Sarvodaya Nagar, KANPUR 208005	21 68 76
Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001	23 89 23
NIT Building, Second Floor, Gokulpat Market, NAGPUR 440010	52 51 71
Patliputra Industrial Estate, PATNA 800013	26 23 05
Institution of Engineers (India) Building 1332 Shivaji Nagar, PUNE 411005	32 36 35
T.C. No. 14/1421, University P.O. Palayam, THIRUVANANTHAPURAM 695034	6 21 17

---

*Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072	27 10 85
†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007	309 65 28
‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002	222 39 71

Printed at Simco Printing Press, Delhi