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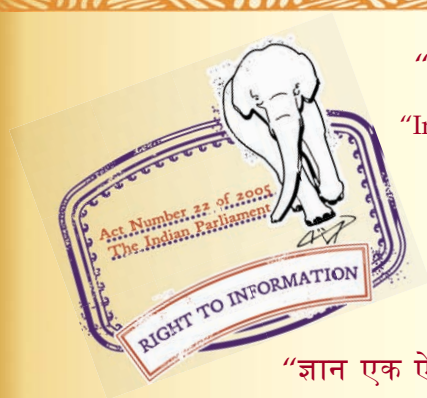
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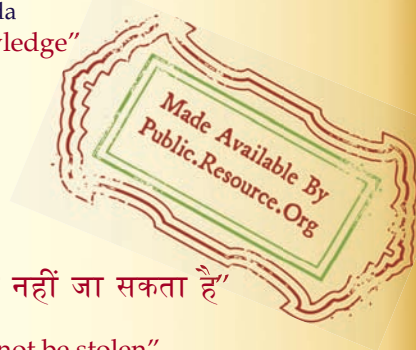
IS 8543-13-1 (1977): Methods of Testing Plastics, Part 13:
Test for Specific Products, Section 1: Buttons
(Thermosetting) [PCD 12: Plastics]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 8543 (Part XIII/Sec I) - 1977
(Superseding IS : 1465 - 1964)

Indian Standard Reaffirmed 1999

METHODS OF TESTING PLASTICS
PART XIII TESTS FOR SPECIFIC PRODUCTS
Section I Buttons (Thermosetting)

UDC 688.2 : 678.5/8.072 : 620.1



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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

METHODS OF TESTING PLASTICS

PART XIII TESTS FOR SPECIFIC PRODUCTS

Section 1 Buttons (Thermosetting)

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(Continued on page 2)

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(Continued on page 12)

Indian Standard

METHODS OF TESTING PLASTICS

PART XIII TESTS FOR SPECIFIC PRODUCTS

Section I Buttons (Thermosetting)

0. FOREWORD

0.1 This Indian Standard (Part XIII/Sec 1) was adopted by the Indian Standards Institution on 7 February 1977, after the draft finalized by the Plastics Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was first published as IS : 1465 in 1959 and revised in 1964. Subsequent to the first revision, comments were received on the curing test, fastness to washing, etc. The Committee after consideration of the comments decided to revise the standard to make suitable modifications. Laboratory tests were conducted on whole buttons as well as cut buttons for curing test. After analysing the test results the Committee felt that the test for curing should be conducted on whole buttons only. For fastness to washing test, experience has shown that buttons normally stand soap-soda solution at 60°C. The Committee, therefore, decided to modify the test permitting the use of soap-soda solution at $60 \pm 2^\circ\text{C}$ for coloured buttons and boiling soap-soda solution for white buttons. Besides, in this revision the dimensions of buttons are given only in millimetre and reference to 'ligne' has been deleted.

0.3 This standard now forms a part of a series of Indian Standards on methods of test for plastics. Consequently, IS : 1465-1964* stands withdrawn.

0.4 In reporting the result 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 XIII/Sec 1) prescribes the methods of sampling and tests for plastic buttons (thermosetting) made from urea-formaldehyde, melamine-formaldehyde and phenol-formaldehyde (phenolic) moulding materials.

*Methods of test for plastic buttons (thermosetting) (revised).

†Rules for rounding off numerical values (revised).

IS : 8543 (Part XIII/Sec 1) - 1977

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given in IS : 2828-1964* shall apply.

3. SAMPLING

3.1 Representative samples of the buttons shall be drawn as prescribed in Appendix A.

4. QUALITY OF REAGENTS

4.1 Unless specified otherwise, pure chemicals and distilled water (see IS : 1070-1977†) shall be employed in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

5. CURING TEST

5.0 Principle — This test is carried out by suspending the whole button in boiling water or dilute sulphuric acid for 20 minutes.

5.1 Procedure — Follow the following procedure in case of buttons other than those made from melamine-formaldehyde:

Suspend the button by means of a cord in boiling water for 20 minutes. Care shall be taken that the whole surface is freely exposed to the boiling water during the period of test. Examine the button for any signs of cracking, pitting, softening, loss of colour or mottling. The buttons shall be deemed to have passed the test if the surface is not adversely affected in appearance, shows no signs of cracking, pitting, softening, loss of colour or mottling; and cannot be scratched anywhere with a finger nail immediately after removal from the boiling water and also after keeping it for 24 hours at room temperature.

5.1.1 In the case of buttons made from melamine-formaldehyde, boil for 10 minutes in dilute sulphuric acid (1 percent by mass) and examine as prescribed in 5.1.

6. FASTNESS TO WASHING

6.0 Principle — This test is carried out by immersing the composite specimen in soap-soda solution at $60 \pm 2^{\circ}\text{C}$ for coloured buttons or in boiling soap-soda solution for 30 minutes for white buttons.

*Glossary of terms used in the plastics industry.

†Specification for water for general laboratory use (second revision).

6.1 Apparatus

6.1.1 Washing Machine — A suitable mechanical washing device consists of a water-bath containing a rotor fastened to a shaft in which are rotated, at a speed of 40 ± 2 rpm, containers of 500-ml capacity. The containers shall be either of glass or of stainless steel. The temperature of the water-bath is thermostatically controlled to maintain the test solution at the desired temperature.

NOTE — The wash-wheel sponsored by the Society of Dyers and Colourists or the Launder-Ometer sponsored by the American Association of Textile Chemists and Colourists or other mechanical apparatus giving identical results may be used for this test.

6.1.2 Monel Metal or Stainless Steel Balls — ten in number, each approximately 6 mm in diameter.

6.2 Reagents

6.2.1 Soap-Soda Solution — containing 2 g of anhydrous sodium carbonate (*see* IS : 296-1974*) per litre of soap solution.

6.3 Preparation of Composite Specimen — Take adequate number of pieces of undyed cotton and woollen cloth, each piece measuring 14×8 cm. On one cotton piece, stitch a number of buttons as specified below. Cover the stitched buttons with a woollen cloth and sew the two pieces together on all four sides. Stitches shall also be placed around each button. Prepare three such composite specimens:

<i>Size of Button</i>	<i>No. of Buttons to be Stitched on Each Cloth</i>
Diameter 25 mm or more	6
Diameter below 25 mm	12

6.4 Procedure for Testing Fastness to Soap-Soda Solution

6.4.1 For Coloured Buttons — Place one composite specimen in one of the containers of the washing machine together with the 10 stainless steel or monel metal balls. To this, add soap-soda solution heated to $60 \pm 2^\circ\text{C}$ so as to give a liquor to specimen ratio of 50:1 (ml:g). Treat the composite specimen for 30 minutes at $60 \pm 2^\circ\text{C}$. Remove the specimen and wash for 10 minutes in cold running tap water. Squeeze it, remove the stitching along three sides, dry it in air in shade. Examine the buttons for change in shade, softening, cracking, mottling or pitting, comparing with the untreated composite specimen. Also examine the covering cloth, which was undyed to start with, for any stains.

*Specification for sodium carbonate, anhydrous (*second revision*).

IS:8543 (Part XIII/Sec 1) - 1977

6.4.2 For White Buttons — Carry out the test with a fresh composite specimen in exactly the same way as given in 6.4.1 with the only difference of treating the specimen for 30 minutes in boiling soap-soda solution. Examine the buttons and cloth as given in 6.4.1.

7. HOT PRESSING TEST

7.0 Principle — The test is carried out by giving to and fro motion for ten times with hot iron over the prepared specimen.

7.1 Procedure — Place the buttons on a piece of dry undyed cotton (or linen) cloth/weighing approximately 125 g/m². Soap another piece of undyed cotton (or linen) cloth in water and wring it to contain nearly its own weight of water. Place the wet piece of undyed cloth on the buttons, press by moving the iron (to give a pressure of approximately 30 g/cm²) heated to 200 ± 10°C to and fro over the wet piece of undyed cloth (without additional pressure) ten times.

7.1.1 Examine the buttons for change in softening, swelling, distortion, blistering, cracking, warping, breaking, change in colour or appreciable loss of lustre, comparing with the untreated buttons.

8. FASTNESS TO ORGANIC SOLVENTS

8.0 Principle — This test is carried out by dipping the test specimen in *n*-heptane benzene mixture, trichloroethylene, carbon tetrachloride and perchloroethylene for 30 minutes.

8.1 Apparatus

8.1.1 Container — provided with means of agitation.

NOTE — A 500-ml conical flask or other suitable narrow-mouth container may be used for the test, the agitation being done by shaking or tumbling in a hand- or motor-driven machine.

8.2 Reagents

8.2.1 *n*-Heptane Benzene Mixture — Prepare a mixture of *n*-heptane and benzene (see IS : 534-1974*) in the ratio of 4:1 by volume.

8.2.2 Trichloroethylene — See IS : 245-1970†.

8.2.3 Carbon Tetrachloride — See IS : 718-1977‡.

8.2.4 Perchloroethylene (Tetrachloroethylene) — See IS : 5297-1977§.

8.3 Preparation of Composite Specimen — The composite specimen shall be prepared as prescribed in 6.3.

*Specification for benzene (second revision).

†Specification for trichloroethylene (second revision).

‡Specification for carbon tetrachloride (second revision).

§Specification for per chloroethylene (tetra chloroethylene), technical (first revision).

8.3.1 The test shall be carried out with each solvent (8.2.1 to 8.2.4) separately.

8.4 Procedure — Place the composite specimen and the solvent in the container, the liquor to specimen ratio being 40 : 1 (ml : g) and agitate by hand or by machine continuously for 30 minutes in solvent at room temperature. Take out, squeeze and dry in shade without unstitching, taking precautions necessary for safety in drying flammable or explosive solvents.

8.4.1 Examine the buttons for change in shade, softening, cracking or loss of lustre, comparing with the untreated specimen. Also examine the white cotton or woollen cloth for any stains.

9. LOAD TEST

9.0 Principle — This test is carried out by putting the specified load on a button for one minute.

9.1 Procedure — Suspend a weight indicated below according to the size of button for one minute by means of a cord passed through the hole of the brass shank or through diagonally opposite holes in the button:

<i>Type of Buttons</i>	<i>Diameter mm</i>	<i>Load to be Applied kg</i>
Buttons (sewing holes)	29	20
	19	20
	16	20
	13	20
	11	10
	10	10
Buttons, general service, drab, large (with brass shanks)	25	30
Buttons, general service, drab, small (with brass shanks)	19	30

9.2 Report, if any cracks appear in the buttons.

10. COLOUR FASTNESS TO LIGHT

10.0 Principle — Colour fastness to light is determined by exposing the test specimen to daylight or fadeometer.

IS : 8543 (Part XIII/Sec 1) - 1977

10.1 Preparation of Test Specimen — Stitch the buttons on a white card of size 15×8 cm. When the diameter of the button is 25 mm and above, eight buttons shall be stitched on the card and when the diameter is below 25 mm, twelve buttons shall be stitched on the card.

10.2 Procedure — For determination of colour fastness to light, either of the tests given in **10.2.1** and **10.2.2** shall be done. But in case of dispute, the method prescribed in **10.2.1** shall be followed.

10.2.1 Daylight Exposure Test — The test specimen shall be tested as prescribed in IS : 686-1957*.

10.2.2 Accelerated Fading Test — The test specimen shall be exposed along with a set of standard patterns to artificial light from a suitable fading lamp and rating shall be done as prescribed in IS : 686-1957*.

APPENDIX A

(Clause 3.1)

SAMPLING OF PLASTIC BUTTONS (THERMOSETTING)

A-1. SCALE OF SAMPLING

A-1.1 Lot — In a consignment, all buttons having the same shape, size and colour shall constitute a lot. If the consignment is declared or known to consist of different shapes, sizes or colours, the buttons belonging to the same shape, size and colour shall be grouped together and each group shall constitute a separate lot.

A-1.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

A-2. SAMPLING FROM LOTS CONTAINING MORE THAN 50 GROSS OF BUTTONS

A-2.1 The number (n) of cartons to be chosen from the lot shall depend upon the size of the lot (N) and shall be in accordance with col 1 and 2 of Table 1. From each of the selected carton, a certain number of buttons shall be taken out after thorough mixing. This number n_1 also depends on the size and shall be determined in accordance with col 3 of Table 1. The selection of cartons from the lot and of buttons from each carton shall be done at random.

*Method for determination of colour fastness of textile materials to daylight.

TABLE 1 NUMBER OF CARTONS AND BUTTONS TO BE SELECTED FOR SAMPLING
(Clause A-2.1)

LOT SIZE, CARTONS	NO. OF CARTONS TO BE SELECTED	NO. OF BUTTONS TO BE TAKEN FROM EACH CARTON SELECTED FOR SAMPLING
N	n	n_1
(1)	(2)	(3)
51 to 300	25	48
301 to 500	50	24
Over 500	75	16

A-2.2 Test Samples and Referee Sample — The buttons thus obtained from the cartons selected for sampling shall be thoroughly mixed so as to make a perfectly homogeneous sample. Divide the buttons into three sets of 400 buttons each. One set of test samples shall be sent to the purchaser and one to the supplier. The third set, bearing the seals of the purchaser and the supplier shall constitute the referee sample and shall be kept at a place agreed to between the purchaser and the supplier.

A-2.2.1 The referee sample shall be used in the case of dispute between the purchaser and the supplier

A-2.3 Number of Tests and Criteria for Conformity

A-2.3.1 Visual Examination — All the buttons in a test sample (**A-2.2**) shall be subjected to such visual examinations as laid down in relevant clauses of the specification. The lot shall be accepted for further tests if the number of defectives found in the test sample is 18 or less; otherwise the whole lot shall be rejected.

A-2.3.2 Performance Tests — The lot accepted after visual examination shall be further subjected to performance tests given in relevant clauses of the specification and shall be examined for each test according to the double sampling plan given in Table 2.

TABLE 2 DOUBLE SAMPLING PLAN

STAGE OF SAMPLING	NUMBER OF SAMPLES	TOTAL NUMBER EXAMINED	ACCEPTANCE NUMBER	REJECTION NUMBER
(1)	(2)	(3)	(4)	(5)
First	40	40	1	8
Second	80	120	7	8

IS : 8543 (Part XIII/Sec 1) - 1977

A-2.3.2.1 Out of the sample of 400 buttons examined visually, 40 buttons shall be selected at random and subjected to one of the performance tests. If the number of buttons which fail to satisfy the test is zero or one, the lot shall be accepted in respect of the test. But if the number of defectives is 8 or more, the whole lot shall be rejected in respect of the test. If the number of defectives is from 2 to 7, another sample of 80 buttons shall be obtained from the remaining buttons, and subjected to the same test. At this second stage, the lot shall be accepted or rejected in respect of this test, as given in the double sampling plan. In the same way, the lot shall be examined in respect of other tests also.

A-3. SAMPLING FROM LOTS CONTAINING 50 GROSS OR LESS OF BUTTONS

A-3.1 For lots containing 50 gross or less of buttons, samples shall be drawn from each carton. The number of buttons n_2 to be taken out at random from each carton shall depend upon the lot size and shall be such as to give a total of at least 360 buttons. Equal number of buttons shall be taken out from each carton.

A-3.2 Test Samples and Referee Sample—The buttons thus obtained from the carton shall be thoroughly mixed to make a homogeneous sample. Divide the buttons into three sets of 120 buttons each. One set of test samples shall be sent to the purchaser and one to the supplier. The third set, bearing the seals of the purchaser and the supplier, shall constitute the referee sample and shall be kept at a place agreed to between the purchaser and the supplier.

A-3.2.1 The referee sample shall be used in the case of dispute between the purchaser and the supplier.

A-3.3 Number of Tests and Criteria for Conformity

A-3.3.1 Visual Examination — All the buttons in a test sample shall be subjected to such visual examinations as laid down in the relevant clauses of the specification. The lot shall be accepted for further tests, if the number of defectives found in the test sample is 6 or less; otherwise the whole lot shall be rejected.

A-3.3.2 Performance Tests — The lot accepted after visual examination shall be further subjected to performance tests given in the relevant clauses of the specification and shall be examined for each test according to the double sampling plan given in Table 3.

TABLE 3 DOUBLE SAMPLING PLAN

STAGE OF SAMPLING	NUMBER OF SAMPLES	TOTAL NUMBER EXAMINED	ACCEPTANCE NUMBER	REJECTION NUMBER
(1)	(2)	(3)	(4)	(5)
First	23	23	0	2
Second	16	39	1	2

IS : 8543 (Part XIII/Sec 1) - 1977

A-3.3.2.1 Out of the sample of 120 buttons examined visually, select 23 buttons at random and subject to one of the performance tests. If all the buttons so tested satisfy the test, the lot shall be accepted in respect of the test. If the number of buttons which fail to satisfy the above test is 2 or more, the whole lot shall be rejected. If it is only one, another sample of 16 buttons shall be obtained from the remaining buttons and subjected to the same test. If none of the buttons tested at the second stage fails to satisfy the above test, the lot shall be accepted; otherwise the lot shall be rejected. In the same way, the lot shall be examined in respect of other tests also.

IS : 8543 (Part XIII/Sec 1) - 1977

(Continued from page 2)

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IS:

- 867-1963 Phenolic moulding materials (*revised*)
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- 2213-1962 Thermosetting moulding materials, methods of sampling
- 2221-1962 Aminoplastic moulding materials
- 2530-1963 Polyethylene moulding materials and polyethylene compounds
- 4669-1968 Polyvinyl chloride resins
- 7888-1976 Flexible polyurethane foam
- 8543 (Part II/Sec 1)-1977 Methods of testing plastics: Part II Testing of materials before moulding, Section 1 Determination of apparent density of moulding materials that can be poured from a funnel
- 8543 (Part II/Sec 2)-1977 Methods of testing plastics: Part II Testing of materials before moulding, Section 2 Determination of apparent density of moulding materials that cannot be poured from a funnel
- 8543 (Part II/Sec 3)-1977 Methods of testing plastics: Part II Testing of materials before moulding, Section 3 Determination of bulk factor of moulding materials
- 8543 (Part XIII/Sec 1)-1977 Methods of testing plastics: Part XIII Test for specific products, Section 1 Method of sampling and test for plastic buttons (thermosetting) (superseding IS : 1465-1964)

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