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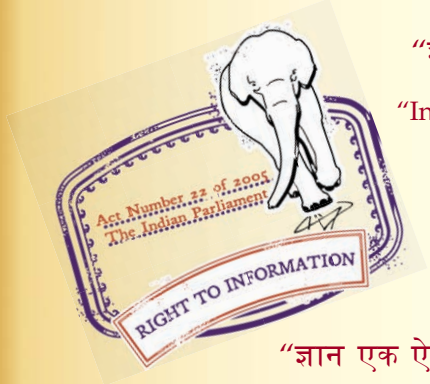
IS 341 (1973): Black japan, Types A, B and C [CHD 20: Paints, Varnishes and Related Products]



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Indian Standard

SPECIFICATION FOR BLACK JAPAN, TYPES A, B AND C

(First Revision)

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Indian Standard

SPECIFICATION FOR BLACK JAPAN, TYPES A, B AND C

(First Revision)

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Indian Standard

SPECIFICATION FOR BLACK JAPAN, TYPES A, B AND C

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 10 October 1973, after the draft finalized by the Paints and Allied Products Sectional Committee had been approved by the Chemical Division Council.

0.2 Black japans constitute a class of general purposes, fast drying, bituminous base paints. The utility of the material depends largely on the ingredients used in their manufacture. Black japans are expected to be free from foreign matter, sediments and undissolved water.

0.2.1 The material, commercially known as black japan Type A, is used for the protection and decoration of metal and wood surfaces which are likely to be marked with white paint or finished with varnishes. Black japan, Type B, is specially suited for application on undergears, coal bunks and platforms of locomotives and underframes of carriages besides other general utility as an outdoor finish. Type C of black japan is especially intended for the protection and decoration of hot surfaces, such as those of locomotives, and for other general purposes where a heat-resisting finish is required.

0.3 This standard is an amalgamated revision of IS : 341-1952*, IS : 1257-1958† and IS : 1704-1960‡. With the publication of this revision IS : 1257-1958† and IS : 1704-1960‡ stand withdrawn.

0.4 Type A of the material covered under this standard intends to achieve the full alignment of JSS 3055 ' Specification for varnish, black japan', issued by the Department of Standardization, Ministry of Defence, Government of India.

0.5 In this revision the requirement for ash content for Types B and C of the material has been specified. For black japan Type C, a requirement

*Specification for black japan.

†Specification for black japan, type B, exterior.

‡Specification for black japan for hot surfaces.

for force-drying time of one hour at 100 to 105°C in scratch hardness test, and a rate of heating in the test for resistance to heat have been prescribed. For Type A of the material, the test for resistance to kerosene has been dropped which was found not necessary by the concerned technical committee as the material is required to pass the test for reaction with white paint and varnishes which are having relatively more aeromatic content which may penetrate more in bitumen than kerosene.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for black japans, Types A, B and C.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in **2.1** of IS : 101-1964†, **2** of IS : 197-1969‡ and IS : 1303-1963§, and the following shall apply.

2.2 Registered Sample — Sample supplied in advance by a prospective supplier and registered by the approved testing authorities after testing it to all the requirements of this standard. A complete record of its performance shall be kept in respect of all tests.

3. TYPES

3.1 The material shall have following three types:

Type A — This material is used for the protection and decoration of metal and wood surfaces likely to be marked with white paint or finished with varnish.

Type B — This material commercially known as black japan B is meant for exterior use and intended for protection and decoration of undergear, coal bunks and platforms of locomotives and underframes of carriages.

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

†Methods of test for ready mixed paints and enamels (*second revision*).

‡Methods of sampling and test for varnishes and lacquers (*first revision*).

§Glossary of terms relating to paints (*revised*).

Type C — This material is durable and heat-resisting and is suitable for application on surfaces which become hot under service conditions, such as those of locomotive and for other general purposes where a heat-resisting finish is required.

4. REQUIREMENTS

4.1 Composition — The materials shall be based on bituminous substances, such as gilsonite, drying oils, resins, driers and thinners in suitable proportions to satisfy the requirements of this standard. Carbon black conforming to IS : 40-1971* to the extent of one percent may be used as opacifier. The cashewnut shell liquid conforming to IS : 840-1964† which is rich in phenolic compounds is recommended in the manufacturing of black japan, Types B and C.

4.2 Resistance to Kerosene — A film of the materials of Types B and C prepared separately and tested as prescribed in Appendix A shall not show any sign of softening resulting in its removal when rubbed with a soft rag.

4.3 Reaction with White Paint — A film of the materials of all the three types when prepared and tested separately with white paint as prescribed in Appendix B shall not show any discolouration of the coat of white paint.

4.4 Reaction with Varnish, Exterior — A film of the materials of Types A and B prepared separately and tested with varnish, exterior, as prescribed in Appendix C, shall not produce green colouration of the varnish film when viewed in direct sunlight.

4.5 Resistance to Heat — A film of the material of Type C prepared and tested in accordance with Appendix D shall not show any signs of running, blistering, cracking or other defects, and also shall not become tacky.

4.6 Durability

4.6.0 This test is required for Types B and C of the material only.

4.6.1 *Registered Sample*

4.6.1.1 A film of the material prepared from the registered sample as described under **E-2** and tested as prescribed under **E-3** shall not break down in less than nine months.

4.6.1.2 A film of the material shall be prepared from the registered sample and tested simultaneously as prescribed under **E-4** in an accelerated weathering apparatus for a period not exceeding 15 days and a complete record of performance maintained.

*Specification for carbon black for paints (*first revision*).

†Specification for cashewnut shell liquid (CNSL) (*revised*).

4.6.2 *Sample from Bulk Supply* — A film of the material prepared from a representative sample from bulk supply as described under **E-2** and tested in the accelerated weathering apparatus as given under **E-4** shall not be materially different in performance as compared with the record of the film of the registered sample when examined daily for a period of 15 days provided it does not fail earlier.

4.7 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR BLACK JAPAN, TYPES A, B AND C

Sl No.	Characteristic	Requirement			Method of Test (Ref to Cl No. in IS : 197-1969*)
		Type A	Type B	Type C	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Drying time, *Max*:				7.2
	a) surface dry	4 hours	8 hours	6 hours	
	b) hard dry	18 hours	18 hours	18 hours	
ii)	Finish	Smooth and glossy			8
iii)	Scratch hardness†	No such scratch as to show the bare metal			10
iv)	Flexibility and adhesion	No visible damage or detachment of film		No damage, detachment or cracking of the film when examined under 10 × magnification	11‡
v)	Stripping test	Scratches free from jagged edges			12
vi)	Flash point	Not below 30°C			13
vii)	Volatile matter, percent by mass, *Max*	55·0	50·0	50·0	15
viii)	Ash content, percent by mass, *Max*	3·0	0·5	0·5	16
ix)	Keeping property	Not less than one year from the date of manufacture			20

*Methods of sampling and test for varnishes and lacquers (*first revision*).

†For Type B of the material the test is to be carried out after 48 hours of air-drying of the paint film whereas in case of Type C, the film shall be force-dried at 100 to 105°C for 1 hour after 24 hours of air-drying and cooled for further 24 hours at room temperature before testing.

‡Method I to be carried for Type C.

5. SAMPLING

5.1 Preparation of Test Samples

5.1.1 *For Registration* — The sample shall be submitted in three different containers each containing not less than 500 ml of the material.

5.1.1.1 As testing to the requirements for Types B and C of this standard covers a period of more than 6 months, the supplier is advised to submit samples for registration sufficiently in advance.

5.1.2 *Tender Sample* — The supplier may dispense with sending a tender sample provided that he declares that the material for which the tender is given is of the same quality as the sample previously registered in his name.

5.1.3 *Bulk Supply Sample* — Representative samples of the material shall be drawn and treated as prescribed under **3** of IS : 197-1969*.

6. TEST METHODS

6.1 Unless specified otherwise, tests shall be carried out as prescribed in IS : 197-1969*. Reference to the relevant clauses of this standard is given in col 6 of Table 1.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1960†) shall be employed in tests.

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

6.3 Comparison with the performance of the registered sample shall be carried out on the basis of the records maintained for the registered sample (*see* **4.6.1.2**).

7. MARKING AND PACKING

7.1 The materials shall be marked and packed as prescribed in IS : 5661-1970‡ or as agreed to between the purchaser and the supplier.

7.1.1 The containers may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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*Methods of sampling and test for varnishes and lacquers (*first revision*).

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

‡Code of practice for packing and marking of packages of paints, enamels, varnishes and allied products.

8. CRITERIA FOR CONFORMITY

8.1 A lot shall be declared as conforming to the requirements of this standard if the test results of the composite samples satisfy the requirements prescribed under **4**.

APPENDIX A

(*Clause* 4.2)

DETERMINATION OF RESISTANCE TO KEROSENE

A-1. PROCEDURE

A-1.1 Apply a coat of the material, by brushing, to a clean 150×150 mm mild steel panel to give a dry film mass of 17 to 25 g/m^2. Allow the panel to air-dry for 96 hours. Immerse the panel in kerosene conforming to IS : 1459-1968* for 5 minutes at 38°C. Remove the panel and wipe the immersed portion with a soft rag.

A-1.2 The film shall not show any sign of softening resulting in its removal when rubbed with a soft rag.

APPENDIX B

(*Clause* 4.3)

DETERMINATION OF REACTION WITH WHITE PAINT

B-1. PROCEDURE

B-1.1 Allow a 150 × 150 mm mild steel panel, prepared as prescribed in Appendix A, to air-dry for 48 hours.

B-1.2 Apply a coat of the white paint conforming to IS : 127-1962† over the film of the material and examine the panel after 24 hours.

B-1.3 There shall be no discolouration of the coat of white paint.

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*Specification for kerosines (*first revision*).

†Specification for ready mixed paint, brushing, finishing, exterior, semi-gloss, for general purposes, white (*revised*).

APPENDIX C

(*Clause* 4.4)

DETERMINATION OF REACTION WITH VARNISH, EXTERIOR

C-1. PROCEDURE

C-1.1 Allow a 150 × 150 mm mild steel panel, prepared as prescribed in Appendix A, to air-dry for 48 hours. Apply a coat of varnish, finishing, exterior conforming to IS : 524-1968* over the film and examine the film after 24 hours.

C-1.2 There shall be no green colouration when the varnish film is viewed in direct sunlight.

APPENDIX D

(*Clause* 4.5)

DETERMINATION OF RESISTANCE TO HEAT

D-1. BLISTERING AND CRACKING

D-1.1 Procedure — Apply one coat of the material on a clean mild steel panel of about 150 × 75 mm size to give a dry film mass of 23 to 33 g/m^2. Allow the panel to air-dry in a vertical position for 48 hours in a well ventilated room at 21 to 38°C. Illuminate the painted surface by diffused daylight for at least eight hours during the drying period. Force-dry at 100 to 105°C for one hour. Heat the panel to 230°C in a vertical position raising the temperature gradually at the rate of 3 to 4°C per minute and maintain this for one hour. Cool to room temperature.

D-1.2 The film shall not show any signs of running, blistering, cracking or other defects.

D-2. TACKINESS

D-2.1 Procedure — Apply one coat of material on a smooth clean glass panel of about 150 × 75 mm size to give a dry film mass of 23 to 33 g/m^2. Allow the panel to air-dry in a vertical position for 48 hours in a well ventilated room at 21 to 38°C. Illuminate the painted surface by diffused daylight for at least 8 hours during the drying period. Force-dry at 100 to 105°C for one hour.

*Specification for varnish, finishing, exterior, synthetic (*first revision*).

D-2.2 Superimpose a second glass panel of about the same size as in **D-2.1** on the painted side of the first panel and apply a load of 1 000 g placing a piece of heat insulating material between the load and the glass. Heat the system for one hour at 230°C. Cool to room temperature and separate the panels.

D-2.3 The film of the material shall be free from visible damage and the unpainted panel shall be free from paint.

APPENDIX E

(*Clause* 4.6)

DETERMINATION OF DURABILITY

E-1. TEST PANELS

E-1.1 Metal Panels — of mild steel fully finished (conforming to deep drawing quality of IS : 513-1973*), size 150 × 100 × 1·25 mm, free from surface imperfections, such as rolling marks and scores, and scale; and shall be commercially available flat skin passed high grade sheet with minimum surface blemishes suitable for a high standard of surface finish.

E-1.1.1 Before use, wipe the mild steel panels to free from excess oil, roughly degrease with petroleum hydrocarbon solvent (conforming to IS : 1745-1966†) or xylene (conforming to IS : 359-1965‡) and then burnish uniformly with IS Grit No. 180 emery cloth (conforming to IS : 715-1966§). Burnish lightly to avoid embedding emery in the surface. The burnishing operation shall be as follows:

a) Straight across the panel, in a direction parallel to any one side;

b) Perpendicular to first direction, and until all signs of original burnishing have been obliterated; and

c) With a circular motion, of diameter approximately 75 mm, until a pattern consisting of circular burnishing marks superimposed one upon another is produced.

Remove the traces of emery dust by wiping with a linen rag.

E-1.1.2 Degrease the panel by swabbing two or three times with a linen rag, soaked in suitable hydrocarbon solvent. Dry the panels slightly to

*Specification for cold rolled carbon steel sheets (*second revision*).

†Specification for petroleum hydrocarbon solvents (*first revision*).

‡Specification for xylole, industrial solvent grade (*revised*).

§Specification for coated abrasives, glue bond (*second revision*).

remove traces of condensed moisture, allow to return to room temperature and then paint without delay. The prepared surfaces should not be touched by hand or otherwise between degreasing and painting.

E-1.2 The back and edges of the panels shall be protected with two coats of a suitable paint.

E-2. PREPARATION OF TEST PANELS

E-2.1 In the painting procedure outlined under **E-2.2**, the air-drying of the films shall be done at the room temperature at a relative humidity of not more than 70 percent.

E-2.2 The surface of the test panels to be exposed shall be prepared as follows:

a) Apply one coat of black japan and allow to air-dry for 48 hours.

b) Rub down lightly with smooth waterproof emery paper, such as No. 320, and apply a second coat of the material and allow to air-dry.

c) After air-drying for 2 days, force-dry the panel at 100 to 105°C for 4 hours. Cool and subject to exposure test as in **E-3.1**.

E-3. NORMAL OUTDOOR EXPOSURE TEST

E-3.1 Expose in the open the test panels prepared in the manner prescribed under **E-1** and **E-2** in duplicate, in a vertical position facing south. Commence the exposure test not earlier than the third week of January and not later than the first week of April.

E-3.1.1 Examine the condition of the exposed films at monthly intervals for the following characteristics:

a) Gloss,

b) Blackness,

c) Checking and cracking,

d) Chalking, and

e) Spotting.

E-3.1.2 For the above examinations, wash the right hand half of the surface of the two test panels by pouring water and then wiping with a soft cloth or chamois leather (*see* IS : 1017-1966*). Adequate time for cooling of the panels to room temperature shall be allowed prior to washing. Examine the same half of the test panels at each examination. As

*Specification for chamois leather (*first revision*).

an aid in the examination, a magnifying glass may be used, but the evaluation shall be based on an assessment with the unaided eye. At the end of the stipulated period for durability test, examine the two halves of the test panels. The sample shall be considered satisfactory if the material surface underneath as well as condition of the film in both the halves, the one washed periodically as well as the other washed only for the final examination is satisfactory by the method of evaluation described hereunder (*see* **E-3.2**). Stray film failure due to extraneous causes other than climatic shall be ignored.

E-3.2 Method of Rating — The film of an unexposed test panel shall be rated with the following basic values for the respective characteristics:

a) Possessing high gloss and blackness	10
b) Possessing correct or normal blackness	20
c) Freedom from checking and cracking	30
d) Freedom from chalking	20
e) Freedom from spotting	20
	100

NOTE — The initial rating of film may be 100 or less according to the condition of gloss and blackness, the rating for freedom from checking and cracking, chalking and spotting being always the maximum in the case of unexposed films.

E-3.3 Evaluation of Exposed Films — In recording the condition of exposed films at each examination, express the observed relative values of different characteristics in percentages of the basic value allotted to each characteristic under **E-3.2.** The allotment of performance values in col 4 of Table 2 shall be in multiples of 10. For arriving at an assessment, multiply the basic value for each characteristic (*see* **E-3.2**) by the percentage awarded by the performance in the test and divide the product so obtained by 100 to obtain the percentage award for the observed value of each characteristic. Take the sum total of these resulting values as the overall assessment.

E-3.3.1 Table 2 is intended to serve as an example for the assessment of a film of black japan after exposure.

E-3.4 Results of Exposure — Reckon the period for the general breakdown of the exposed film from the date of commencement of exposure to the time when the overall assessment falls below 50 percent or when the performance value of any one characteristic falls below 25 percent of the basic value adopted for that characteristic. In the example given under **E-3.3.1,** although the overall assessment is 52·0 percent, yet the film is to be regarded as having generally broken down, because the performance value of chalking has fallen below 25 percent of its basic value.

TABLE 2 EXAMPLE OF REPORTING EVALUATION OF EXPOSED FILMS

(*Clauses* E-3.3 *and* E-3.3.1)

Sl No.	Characteristic	Basic Value	Performance Value, Percent of Basic Value	Assessment Value, Computed from Performance Value
(1)	(2)	(3)	(4)	(5)
i)	Possessing high gloss	10	50	5
ii)	Possessing correct colour	20	60	12
iii)	Freedom from checking and cracking	30	50	15
iv)	Freedom from chalking	20	20	4
v)	Freedom from spotting	20	80	16
			Total	52

E-4. ACCELERATED WEATHERING TEST

E-4.1 Accelerated Weathering Apparatus — An artificial weathering apparatus of the carbon arc type for uniform and controlled exposure to the effects of heat, light and water shall be used.

E-4.2 Samples for registration shall be tested in duplicate in a suitable accelerated weathering apparatus (*see* **E-4.1**) and samples drawn from bulk supply shall be tested in a similar manner. The test panels shall be prepared as described in **E-2.2.** The requirements of this test shall be taken to have been satisfied, if the performance of the film is not materially different as compared with the record of the film of the registered sample.

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