



नेपाल गुणस्तर
NEPAL STANDARD

ENAMEL, EXTERIOR: (A. UNDERCOATING
B. FINISHING — SPECIFICATION) PART-1



Government of Nepal

Ministry of Industry, Commerce and Supplies

Nepal Bureau of Standards and Metrology (NBSM)

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1 SCOPE

This standard prescribes requirements and methods of sampling and test for the material commercially known as enamel, exterior: (a) undercoating (b) finishing. The material is used in painting systems for protection and decoration.'

2 REFERENCES

The standards listed in Annex A contains 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 in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in **NS***** and the following shall apply.

3.1 Approved Sample — The sample accepted by the indenter or inspection authority as the basis for the supply. When a sample tested and approved by the purchaser or inspection authority, the result of such tests as permits the supplier to meet the limits imposed by the specification for deliveries shall be made available to the supplier.

3.2 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.

3.3 Tender Sample — The sample submitted by the supplier with his tender.

3.4 Standard Atmospheric Conditions for Testing — An atmosphere with a relative humidity of 65 ± 5 percent and a temperature of $27 \pm 2^{\circ}\text{C}$ provided that in a given series of experiments, the temperature does not vary by more than $\pm 1^{\circ}\text{C}$ (*see also NS ****).

3.5 Room Temperature

It shall mean a temperature between 21 and 38°C unless otherwise specified.

4 CLASSES

The material shall be supplied in brushing consistency but shall be suitable for application by brushing and spraying after thinning with a suitable thinner as agreed to between the purchaser and the supplier.

5 COLOUR CATEGORIES

For the purpose of registration of the samples of the material, the colour categories as given in Table 1 shall be employed.

6 REQUIREMENTS

6.1 Composition

The material shall be of such a composition as to satisfy the requirements of this standard. The compositions of the pigment and the vehicle of the bulk supply shall be similar to those of the registered sample within the permissible limits allowed in this specification.

6.1.1 The quantity of major constituents of the pigment composition of the bulk supply and that of the registered sample shall not deviate by more than ± 25 percent by mass when the bulk supply is of different colour shade from that of the registered sample but in the same colour category. However, when the bulk supply is of the same shade as that of the registered sample the deviation shall not be more than ± 15 percent by mass. The total extender in the composition of the bulk supply and that of the registered sample shall not deviate by more than ± 25 percent by mass even if the extender is not a major constituent in the registered sample. Any silicious or extraneous matter present to the extent of 0.5 percent by mass on paint, if absent in bulk supply shall not be the cause for rejection.

NOTE — Any constituent of pigment showing 20 percent by mass and above of the total pigment composition shall be considered as a major constituent of the pigment.

6.1.2 When no extender is present in the pigment of the registered sample, not more than 5 percent by mass of silicious/inert matter of the total pigment content in the material shall be allowed in the bulk supply.

6.1.3 In undercoating the sum total of genuine pigments shall not deviate by more than ± 25 percent by mass, between the registered sample and the bulk supply when the bulk supply is of different colour shade than that of the registered sample but in the same colour category. When the bulk supply is of the same shade as that of the registered sample, the deviation shall not be more than ± 15 percent by mass.

6.1.4 When the bulk supply is of the same shade as that of the registered sample, the permissible limits allowed shall be as specified below:

a) The total non-volatile matter, which includes pigments, extenders if present and vehicle solids, shall not deviate by more than ± 10 percent by mass from the recorded data of the registered sample when estimated by the method prescribed in NS 177. This applies to both undercoating and finishing enamels.

b) The total pigment content of the material including extenders, if present content of the material shall not deviate by more than ± 15 percent by mass from that of the registered sample. This applies to both undercoating and finishing.

6.1.5 The phthalic anhydride content of the non-volatile vehicle in the bulk supply shall not deviate by more than ± 15 percent from that of the registered sample, when estimated by the method prescribed in **NS*****.

6.2 Durability

6.2.1 Registered Sample

6.2.1.1 When prepared and tested as prescribed under **B-3** up to a period of 12 months, a film prepared from the sample for registration of the material shall satisfy the requirements of the tests.

6.2.1.2 A film of the sample for registration shall be prepared and tested in an accelerated weathering apparatus using xenon arc, as prescribed under **B-4** and examined every third day for a period of 15 days and a complete record of its performance maintained.

6.2.1.3 QUV apparatus may be used as an alternative when tested with a sample for a period of 150 h under the test conditions mentioned hereunder:

- a) Lamp type: UV 313
- b) Test Cycle: UV 4 h at $60 \pm 3^\circ\text{C}$ Condensation 4 h at $50 \pm 3^\circ\text{C}$
- c) Irradiance: $0.71 \text{ W/m}^2/\text{nm}$
- d) UVB wavelength: 310 Nm (approx.)

The test panel shall be examined every third day for the entire period of test (500 h) and a complete record of its performance maintained.

NOTES

*1 As a precaution against inadvertent accidents, it is recommended that the outdoor exposure test (see **B-3**) and the accelerated weathering test (see **B-4**) are carried out in duplicate.*

*2 For details of method of tests for both xenon arc and QUV apparatus follow 5 and 6 of NS***).*

6.2.2 Bulk Supply

A film of the enamel prepared from a representative sample from bulk supply as prescribed in **B-2** and tested in the accelerated weathering apparatus (see **B-4**) and examined every third day for a period of 15 days shall comply with the requirements specified in **6.2.2.1** and **6.2.2.2**.

6.2.2.1 Gloss (specular 60°) retention when tested as prescribed in NS 177, of bulk supply shall be within ± 10 units of that of the registered sample.

NOTE — At any time during the weatherometer test, the percentage value of gloss (specular 60°) retention of the bulk supply sample shall not vary by more than ± 10 units from the recorded data of the registered sample; for example, when the registered, sample showed 70 percent gloss retention at any particular stage of weatherometer test, the bulk supply sample shall show gloss retention of 60 to 80 percent at the corresponding stage of testing.

6.2.2.2 The results of observation on characteristics of the colour, checking, cracking, chalking, spotting, etc, of the bulk supply sample shall not be more than slightly different from the recorded data of the registered sample.

6.3 The minimum mass, in kg/10 litre, of the material shall be within ± 3 percent when the shade is the same as the registered sample and ± 5 percent when the shade is different from the registered sample but within the same shade category. In no case, however, the mass per 10 litres shall be less than the stipulated minimum as mentioned in Table 1.

6.4 Lead Restriction

The material shall be tested for restriction from lead in accordance with NS 177. When thus tested the material shall not contain lead or compounds of lead or mixtures of both, calculated as metallic lead exceeding 90 ppm.

6.5 The material shall also comply with the requirements given in Table 2.

Table 1 Colour Categories**(Clause 5)**

Colour. Category No.	Colour Shade	NSC No as per NS ***	Shade Recommended for Registration of Samples
1	White	—	White
2	Black	—	Black
3	Dark violet	796	Dark violet
4	i) Sky blue	101	
	ii) Turquoise blue	102	
	iii) Oriental blue	174	Turquoise blue
	iv) Light admiral grey	697	
	v) Phirozi	176	
	vi) Satin blue	177	
5	i) Eau-de-nil	216	
	ii) Opaline green	275	
	iii) Apple green	281	Apple green
	iv) Bus green	299	
6	i) Peacock blue	103	
	ii) Azure blue	104	Traffic blue
	iii) Traffic blue	169	
7	i) Oxford blue	105	Oxford blue
	ii) Navy blue	106	
8	Aircraft blue	108	Aircraft blue
9	French blue	166	French blue
10	i) Sea green	217	Sea green
	ii) Verdigris green	287	
11	i) Sage green	219	Sage green
	ii) Light olive green	278	
	iii) Aircraft grey green	283	
12	i) Grass green	218	
	ii) Traffic green	267	Traffic green or Grass green
	iii) India green	284	
	iv) Brilliant green	221	
13	i) Light brunswick green	225	

	ii) Middle brunswick green	226	Middle Brunswick
	iii) Deep brunswick green	227	
	iv) I.incoln green	276	
	v) Cypress green	277	
	vi) Forest green	282	
14	i) Olive green	220	
	ii) Light bronze green	222	
	iii) Middle bronze green	223	
	iv) Deep bronze green	224	Olive green
	v) Steel furniture green	279	
	vi) Scamic	294	
	vii) Olive drab	298	
15	Canary yellow	309	Canary yellow
16	i) Lemon	355	Golden yellow
	ii) Golden yellow	356	
17	i) Pale cream	352	
	ii) Deep cream	353	
	iii) Light stone	361	
	iv) Portland stone	364	
	v) Vellum	365	Pale cream
	vi) Light straw or	384	Deep cream
	vii) Light biscuit	385	
	viii) Champagne	386	
	ix) Sunshine	387	
	x) Beige	388	
	xi) Jasmine yellow	397	
	xii) Light salmon pink	442	
	xiii) Salmon pink	443	
18	Primrose	354	Primrose
	19 Light buff	358	Light buff
	20 i) Middle buff	359	
	ii) Deep buff	360	Deep buff
	iii) Middle stone	362	
21	i) Dark stone	363	
	ii) Light brown	410	
	iii) Middle brown	411	Light brown
	iv) Golden brown	414	
	v) India brown	415	
	vi) Leaf brown	489	
22	i) Dark brown	412	
	ii) Orange brown	439	

	iii) Venetian red	445	
	iv) Red oxide	446	Gulf red
	v) Deep Indian red	448	
	vi) Light purple brown	449	
	vii) Gulf red	473	
	viii) Beech brown	490	
23	i) Nut brown	413	
	ii) Chocolate	451	Nut brown
	iii) Service brown	499	
24	Terra cotta	444	Terra cotta
25	i) Fire red	536	
	ii) Signal red	537	
	iii) Post office red	538	Post office red
	iv) Crimson	540	or signal red
	v) international orange	592	
26	Maroon	541	Maroon
27	i) Traffic yellow	368	
	ii) Light orange	557	Deep orange
	iii) Traffic red	570	
	iv) Deep orange	591	
28	India saffron	574	India saffron
29	i) Silver grey	628	
	ii) Quaker grey	629	
	iii) French grey	630	
	iv) Light grey	631	
	v) Dark admiral grey	632	Light grey and
	vi) Smoke grey	692	Aircraft grey
	vii) Aircraft grey	693	
	viii) Dove grey	694	
30	i) RAF blue grey	633	
	ii) Slate	634	
	iii) Lead grey	635	RAF blue
	iv) Middle graphite	671	
	v) Dark blue grey	695	

Table 2 Requirements for Enamel, Exterior: (A) Undercoating, (B) Finishing

(Clause 6.5)

S.N.	Characteristics	Requirement		Method of Test, Ref to	
		Undercoating	Finishing	NS 177	Annex
i)	a) Consistency	Smooth, uniform and suitable for brushing without appreciable drag on the brush		1 (2)	C
	b) Viscosity, s in No. 4 ford cup at 27 °C ± 2 °C	← 80 to 120 →		NS ***	—
ii)	Mass, kg/10 l, <i>Min</i>	12	8.5	1(19)	—
iii)	Drying time, h, <i>Max</i>				—
	a) Surface dry	-	8		
	b) Hard dry	12	18		
	c) Tack free	-	24		
iv)	Wet opacity <i>Min</i> , m ² /10 litre	However, it shall be between -10 percent and +20 percent of the registered sample		1(8)	—
v)	a) Finish	Smooth and matt to egg shell gloss	Smooth and glossy	1(3)	—
vi)	Fineness of grind, microns, <i>Max</i>	50	15		—
vii)	Colour	Approximate match to the finishing enamel	Close match to the specified NS colour as per NS*** or to an agreed colour where NS colour not specified	1(9)	—
viii)	Water content (if water is suspected to be present), percent by mass, <i>Max</i>	—	0.5	1(12)	—
ix)	Flexibility and adhesion				
	a) Scratch hardness (Load 1 000 g),	No such scratch as to show the bare metal after 48 h air drying		1(14)	—

	b) Bend test, (with 6.25 mm Dia Mandrel in Type 1 apparatus)	← No visible damage detachment After →		1(14)	—
		48 h of air drying	96 h of air drying		
x)	Stripping Test	Scratches free from jagged edges after 96 h air-drying		1(15)	D
xi)	Flash point	← Not below 30°C →		1(18)	-
xii)	Keeping properties	Not less than one year from the date of manufacturing			—

6.6 Optional Requirements

In addition, if agreed to between the purchaser and the supplier, the spreading capacity and spreading time shall be determined in accordance methods prescribed in Annex E and the results recorded on the sample offered for registration against this specification. In case of supplies offered against any approved sample to this specification, spreading capacity shall be minimum 90 percent of the approved sample and spreading time shall not deviate by more than 10 percent from that of the approved sample.

7 PACKING AND MARKING

7.1 Packing

Unless otherwise agreed to between the purchaser and the supplier, the paint shall be packed in metal containers conforming to **NS*****. The packing is subject to the provisions of the law in force in the country at that time.

7.2 Marking

Each container shall be marked with the following:

- a) Name of the material and indication whether undercoating or finishing;
- b) Indication of the source of manufacture;
- c) Lead content (Maximum);
- d) A statement 'synthetic', if the material contains phthalic anhydride;
- e) Volume of the material;
- f) Batch number or Lot number in code or otherwise;
- g) Month and year of manufacture;
- h) Colour/shade of the material; and
- j) A cautionary note as below:
 - 1) Keep out of reach of children.

2) Dried film of this paint may be harmful if eaten or chewed.

3) This product may be harmful, if swallowed or inhaled.

7.3 NS Certification Marking

The container may also be marked with the Standard Mark.

7.3.1 The use of the Standard Mark is governed by the provisions of *Nepal Standards Act, 2037* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from NBSM.

8 SAMPLING

8.1 Preparation of Test Samples

8.1.1 For Registration

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

8.1.1.1 As testing to the requirements of this standard covers a period of more than 12 months, the supplier is advised to submit samples for registration sufficiently in advance within the period from October to December of the year, so that outdoor exposure test can be started during the period stipulated in **B-3.1**.

8.1.2 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.

8.1.3 Bulk Supply Sample

Representative samples of the material shall be drawn and treated as prescribed as per **NS *** (Part 1/ Sec 1). Methods of sampling and test for paints, varnishes and related products, Part 1: Test on liquid paints (general and physical), Section 1: Sampling: Paints, Varnishes and Related Products.**

8.1.4 For Drying Time

Prepare mild steel panel of sizes 150 mm × 100 mm × 1.25 mm as prescribed in **NS*** Methods of sampling and test for paints, varnishes and related products, Part 1: Test on liquid paints (general and physical), Section 3: Preparation of panels: Paints, Varnishes and Related Products.** Apply the paint uniformly on each side of the panel by brushing to give a dry film mass commensurate with the mass per 10 litre as specified in Table 1 of NS 1(10). Prepared test panel then subjected to the test as specified in NS 177 as soon as possible.

8.1.5 For Flexibility and Adhesion Test and Stripping Test

For bend test, scratch hardness test and stripping test prepare separate burnished tin plate panels, rectangular, of sizes 100 mm × 50 mm × 0.3 mm as prescribed in 3 of IS 101 (Part 1/Sec 3). Apply one coat of material uniformly by brushing on the panels as to give a dry film mass commensurate with the mass per 10 litre as specified in Table 1 of IS 101(Part 3/Sec 4). The coated test panels shall be hard dried for the time specified in Table 1 and then shall be conditioned at a temperature of $27 \pm 2^{\circ}\text{C}$ and relative humidity of 65 ± 5 percent for a minimum time of 16 h. Prepared test panels then subjected to the test as prescribed in NS 177 for bend test and scratch hardness test respectively and in Annex D for stripping test.

8.2 Criteria for conformity

A lot shall be declared conforming to the requirements of this standard if the test results of the composite sample satisfy the requirements prescribed in 6.

9 TESTS

9.1 Tests shall be conducted as prescribed in 6.1 to 6.4 and the test methods prescribed referred in col 5 and col 6 of Table 2.

9.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see NS *****) shall be employed in tests.

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

9.3 Comparison with the performance of the registered sample shall be carried out on the basis of the records maintained for the registered sample (*see 6.2.1*).

ANNEX A

(Clause 2)

LIST OF REFERRED NEPALI STANDARDS

1. NS 177:2045 पुर्व मिश्रित पेन्ट तथा इनामेलको परिक्षण विधि

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ANNEX B

(Clause 6.2.2)

TEST FOR DURABILITY

B-0 GENERAL

B-0.1 Outline of the Method

The durability of the material is determined by ascertaining actual behaviour of suitably prepared test panels in normal outdoor exposure test for a specified period and evaluating the results of the exposure by a suitable method of rating for various characteristics of the enamel film. Apart from this, the enamel is also evaluated by an accelerated weathering test wherein a prepared panel is subjected to controlled exposure of heat, light and water in an artificial weathering apparatus.

B-1 TEST PANELS

B-1.1 The panels shall be mild steel plate and shall be prepared as prescribed as per **NS*** Methods of sampling and test for paints, varnishes and related products, Part 1: Test on liquid paints (general and physical), Section 3: Preparation of panels: Paints, Varnishes and Related Products**. The back and edges of the panels shall be protected with two coats of a suitable paint.

B-1.1.1 For the Outdoor Exposure Test

Panels shall be of sizes 300 mm × 300 mm × 1.6 mm

B-1.1.2 For the Accelerated Weathering Test

Panels shall be preferably of sizes 60 mm × 40 mm × 1.25 mm for xenon arc type and 150 mm x 75 mm × 1.25 mm for UV condensation type apparatus. However, panels may be of any other sizes suitable for accommodating in those apparatus.

B-2 PREPARATION OF TEST PANELS

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

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

- a) Apply one coat of ready mixed paint, air drying, red oxide-zinc phosphate, priming [**conforming to NS*** Ready Mixed Paint, Air Drying, Red Oxide Zinc Phosphate, Priming: Paints, Varnishes and Related Products**] by appropriate method (brushing/spraying) and allow to air dry for 24 h.
- b) Rub down lightly with waterproof emery paper No. 280/320 and apply by appropriate method (brushing/spraying) one coat of the undercoating enamel and allow to air-dry for 24 h.

- c) Rub down, wet with waterproof emery paper No. 280/320, wash and wipe off water, apply by appropriate method (brushing/spraying) one coat of the finishing enamel when the surface is dry, and allow to air dry for 24 h.
- d) Rub down, wet with waterproof emery paper No. 320, wash and wipe off water, apply by appropriate method (brushing/spraying) a second coat of the finishing enamel when the surface is dry, and allow to air dry for 7 days before subjecting to exposure test.

B-3 NORMAL OUTDOOR EXPOSURE TEST

B-3.0 Subject the samples for registration and the tender sample, if supplied, to normal outdoor exposure test in the manner described under B-3.1.

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

B-3.1.1 Examine the condition of the exposed films at monthly intervals for gloss retention and at bi-monthly intervals for the other characteristics given below:

- a) Colour;
- b) Checking and cracking;
- c) Chalking; and
- d) Spotting.

B-3.1.2 For the above examinations, wash the righthand half of the surface of the two test panels by pouring water and then wiping with a soft cloth or chamois leather (*see NS****). 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 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 one washed only for the final examination is satisfactory by the method of evaluation described under **B-3.2**. Stray film failure due to extraneous causes other than climatic shall be ignored.

B-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	25
b) Possessing correct colour	25
c) Freedom from checking and cracking	35
d) Freedom from chalking	10
e) Freedom from spotting	5

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

B-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 B-3.2. The allotment of performance value should be multiples of 10. For arriving at an assessment, multiply the basic value for each characteristic (*see* B-3.2) by the percentage awarded for 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.

B-3.3.1 The following table is intended to serve as an example for the assessment of an enamel film after exposure:

S.N.	Characteristic	Basic Value Percent	Performance Value Percent	Assessment Value Percent
i)	Possessing high gloss	25	50	12.5
ii)	Possessing correct colour	25	60	15.0
iii)	Freedom from checking and cracking	35	60	21.0
iv)	Freedom from chalking	10	20	2.0
v)	Freedom from spotting	5	80	4.0
Total		100		54.5

NOTE — Other characteristics being found satisfactory, the sample shall not be rejected on the ground of gloss retention being lower than 25 percent, but the gloss retention figure shall be reported.

B-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 fall below 25 percent of the basic value adopted for that characteristic. In the example given under B-3.3.1, although the overall assessment is 54.5 percent, yet the film is 50 be regarded as having generally broken down, because the performance value of chalking has fallen below 25 percent of its basic value.

B-3.5 Protection Against Corrosion

After the exposure of the film is discontinued, examine for corrosion of the metal surface of the panel underneath by removing film at 5 different places, one in the centre and one each at 4 different places near the 4 corners about 50 mm away from either edge. The paint film shall be removed by solvent type paint remover. When the film is softened by the paint remover, it shall be removed by gently rubbing with cotton swab or waste jute taking care to remove adhering film of primer and/or undercoating. After removal of the film, the exposed metal shall be covered by thick mineral oil or petroleum jelly. Localized corrosion and/or rust spots shall not constitute a cause of failure. To satisfy the requirements of this standard, the metal surface shall be otherwise free from corrosion.

B-4 ACCELERATED WEATHERING TEST

B-4.1 Accelerated Weathering Apparatus

An artificial weathering apparatus of the xenon arc type for uniform and controlled exposure to the effects of heat, light and water.

B-4.2 Procedure

B-4.2.1 The panel for this test shall be prepared as described under **B-2.2**. Samples for registration shall be tested in duplicate in a suitable accelerated weathering apparatus (*see B-4.1*) and samples drawn from the bulk supply shall be tested in a similar manner.

B-4.2.2 Commonly used cycles and test conditions for Xenon arc apparatus are given below:

- a) Black panel temperature $63 \pm 3^{\circ}\text{C}$;
- b) Continuous exposure in light for 102 min and intermittent exposure to water spray for 18/20 min light and spray; and
- c) Irradiance $0.55 \text{ W/m}^2/\text{nm}$.

However, any other cycle may be used, if mutually agreed upon between the purchaser and the supplier.

B-4.2.3 The exposed film shall be evaluated for gloss and various film properties as prescribed under **B-3.2**.

B-4.2.4 The requirement of this test on a sample from bulk supply shall be taken to have been satisfied, if the gloss retention shall be minimum 40 percent of the original and the performance in respect of the other film characteristics is generally similar to that obtained with the registered sample.

ANNEX C

[Table 2, Sl No. (i)]

CONSISTENCY

C-1 APPARATUS

C-1.1 Palette Knife or Metal Rod

C-1.2 Panels

C-1.2.1 Unless specified otherwise, mild steel panels of size 150 mm × 50 mm × 1.25 mm shall be prepared as prescribed as per **NS*** Methods of sampling and test for paints, varnishes and related products, Part 1: Test on liquid paints (general and physical), Section 3: Preparation of panels : Paints, Varnishes and Related Products.**

C-2 PROCEDURE

C-2.1 Insert a clean metal rod or palette knife into the original container and examine the nature of settling.

C-2.2 Observations

The material shall not cake hard inside the container and shall be in such a condition that stirring easily produces a smooth uniform paint suitable for brushing on steel panels.

ANNEX D

[Table 2, Sl No. (x)]

STRIPPING TEST

D-0 OUTLINE OF THE METHOD

The minimum load required to produce a scratch showing the bare metal surface of the panel painted with the material is determined.

D-1 APPARATUS

The Apparatus used for determining scratch hardness as prescribed in 3.2.2 of NS 177 shall be used.

D-2 PROCEDURE

D-2.1 Preparation of Test Panels

Mild steel panels described under 8.1.5 shall be prepared.

D-2.2 Test the dried film in the apparatus under such a load that a scratch is produced showing the bare metal surface.

D-3 OBSERVATIONS

The paint shall be deemed to have passed the test if the scratch so produced shall be free from jagged edges.

ANNEX E

(Clause 6.6)

SPREADING CAPACITY AND SPREADING TIME

E-0 OUTLINE OF THE METHOD

E-0.1 For spreading capacity, the area to be covered by 10 litre of the paint is measured.

E-0.2 For the spreading time, the time taken to spread a definite quantity of the paint over a fixed area is measured.

E-1 APPARATUS

E-1.1 Weighing Balance of Suitable Capacity

E-1.2 Suitable Brush

E-1.3 Stop Watch

E-1.4 A non-absorbent smooth surface, one square metre in area preferably of mild steel.

E-2 Procedure

Weigh an appropriate quantity of the material together with a suitable brush. The material shall then be applied by brushing to a flat, smooth and non-absorbent surface, 1 m² in area, in a uniform normal coat commensurate with satisfactory coverage and appearance. The balance of the material with the brush shall be weighed. The time taken also shall be noted.

E-3 Calculation

The spreading capacity shall be calculated as the number of square metres that can be covered by 10 litres of paint. The spreading time shall be the time taken to cover 100 m² of the surface.