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Draft Indian Standard

**CARE AND MAINTENANCE OF BRUSHES — CODE OF PRACTICE
PART 1 PAN SET BRUSHES**

[Second Revision of IS 3451 (Part 1)]

(ICS 25.220, 87.100)

Brushware, Polishes, Lac, Lac Products Sectional
Committee, CHD 23

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Brushware, Polishes, Lac, Lac Products Sectional Committee, CHD 23

FOREWORD

(Formal clause shall be added later)

The life and serviceability of brushes are often reduced by neglect of some simple but important practices which a user should know and observe as a routine, before, during and after use. The care and maintenance are particularly of importance to painters as paint brushes undergo maximum wear and tear. The need, therefore, for supplying basic information on proper care and maintenance of brushes has often been impressed upon the manufacturers. This standard (Part 1) covers the care and maintenance of brushes for pan-set brushes. Care and maintenance for other than pan-set brushes has been dealt in Part 2.

This standard was first published in 1966. In first revision in 1978, guidance on the use of various types of brushes to get better performance and longer life was added.

This second revision has been taken up in order to bring out the standard in the latest style and format of the Indian Standards. The relevant clauses have been added and the references have been updated.

Salvaging of brushes, which have been spoilt due to neglect in maintenance, is possible to some extent. This may not be exactly a part of daily care which a brush requires. However, some suggestions for salvaging such damaged brushes have also been recommended in this standard to help the user.

*Draft Indian Standard***CARE AND MAINTENANCE OF BRUSHES — CODE OF PRACTICE****PART 1 PAN SET BRUSHES***(Second Revision)***1. SCOPE**

This standard lays down the practices to be followed in the care and maintenance of pan set brushes using bristles, animal hair, vegetable fibre and synthetic fibres like nylon monofilament, covered under the following Indian Standard specifications:

- IS 384 (Part 1) : Flat brushes for paints and varnishes — Specification Part 1 Heavy duty (*seventh revision*) 2023
- IS 384 (Part 2) : Brushes paints and varnishes flat specification Part 2 Household purposes (*seventh revision*) 2023
- IS 486 : 2023 Brushes sash tool for paints and varnishes — Specification (*fifth revision*)
- IS 487 : 2023 Brushes, paints and varnishes — (i) Oval, ferrule bound; and (ii) Round, ferrule bound (*sixth revision*)
- IS 1103 : 1984 Brushes, artists — Specification (*second revision*)
- IS 1104 : 1984 Specification for brushes, lettering (*second revision*)
- IS 4208 : 1985 Specification for brush, stencil (second revision)
- IS 4580 : 1986 Specification for brushes, shaving (*first revision*)

2 REFERENCES

The standards listed below contains provisions which though 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.

<i>IS No.</i>	<i>Title</i>
IS 170 : 2020	Acetone — Specification (<i>fifth revision</i>)
IS 539 : 1974	Specification for Naphthalene (<i>second revision</i>)
IS 707 : 2011	Glossary of terms applicable to timber technology and utilization
IS 1103 : 1984	Brushes, artist's — Specification
IS 1104 : 1984	Specification for brushes, lettering (<i>second revision</i>)
IS 5060 : 1969	Glossary of terms used in brushware industry

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 5060 and IS 707 shall apply.

4 CARE AND MAINTENANCE OF BRUSHES BEFORE USE**4.1 Damage Due to Insects and Micro-organisms**

4.1.1 Insect Damage — New and unused brushes are more susceptible to attack from grubs of beetles, moths, etc., which immediately feed on the filling material when they hatch out. Other insects, like pig lice and horse lice, also do such damage.

4.1.2 Damage due to Bacteria and Moulds — Certain forms of bacteria and moulds, such as mildew, attach the filling material and cause their discoloration, and also rotting.

4.1.3 To prevent insect attack, all types of pan set brushes should be stored, wrapped in tissue paper or cellophane paper in a closed container together with a naphthalene flakes or balls (*see* IS 539). The brushes except pitch set and nylon monofilament may also be dusted with suitable insect repellents, such as DDT dusting powders or *p*-dichlorobenzene.

4.1.4 Pitch set brushes should not be dusted. They should be protected by spraying lightly with liquid emulsion of DDT or BHC and stored wrapped in tissue paper or cellophane paper.

4.1.4.1 In case of brushes made of synthetic fibres, insect attack is of little significance. As such these brushes may be stored in a closed container after being wrapped in tissue paper or cellophane paper.

4.1.5 Flag end of bristles is the most vulnerable point for insect attack. Soft hair brushes are more susceptible to such attack. Brushes should, therefore, be flirited periodically so that any eggs laid in the interval are dislodged.

4.1.6 The presence of water and of the particular organism is essential for the development of mildew, which is aided by warm conditions. High temperature kills such organisms. Brushes shall, therefore, be stored, as far as possible, in a dry atmosphere.

4.2 Soaking in Water

4.2.1 Brushes in which the filling materials are bound directly to the handle (for example, string bound, leather bound and wire tied brushes) shall be soaked in water upside down, or alternatively a little water may be poured into the throat each time before use. Expansion of handles and filling materials, when first wetted, stretch the binding so that it becomes loose when the brush dries out. It shall, therefore, be tightened again, before it is used. Alternatively, a little water poured into the throat of the brush may be equally effective.

4.2.2 Metal ferruled brushes filled with bristle or hair or both shall not be soaked in water before use. Such treatment may cause the filling materials to swell to such an extent that the cement and binding are ruptured. Water may cause the handle if made of timber to swell and it may then fit loosely when it subsequently dries out.

4.2.3 Normally for distempering, brushes with dyed filling materials shall not be used. In case brushes with dyed filling materials are to be used especially with a pale coloured distemper the filling materials of the brush shall be washed in several changes of water, if not in thinned distemper, till the washing fluid stands colourless.

4.3 Flirting — The brushes shall be worked with the hand or on a dry surface, before use, to ensure that none of the bristles, hairs, etc., is loose.

4.4 Oiling — New paint brushes containing bristles or hair should be kept suspended in a bath containing 50 percent of raw linseed oil and 50 percent of white spirit (petroleum hydrocarbon solvent) before using in oil paint for at least 24 hours, in such a way that the tip ends of the filling material remain at least 12 mm above the bottom of the bath and the ferrule remains about 20 mm above the top level of the bath. Before such treatment the filling materials of the brush may be wrapped with paper to conserve the shape, in such a way that the oil may run inside the wrapping. The brush shall be kept suspended in this way till the same is required for use. It is advisable not to keep a new brush for too many days in the bath. Just before use, the brush should be rinsed in white spirit and finally in the respective paint so as to remove the last trace of oil. The use of turpentine oil (vegetable turpentine) is not advisable as the traces of gum present in the turpentine may interfere with the behaviour of paint.

4.4.1 The practice of keeping, the brush in cool closed container wrapped in fresh paper after oiling, in case the same is not required immediately after oiling is not advisable, as the process may cause drying of oil. It is better to keep it in the bath till required for use.

4.4.2 New shaving brushes whether made of bristle, hair or nylon monofilament should be sterilized properly in a solution of potassium permanganate (warm) or at least kept in boiling water for a few minutes before use.

5 CARE OF BRUSHES DURING USE

5.1 Choice of Brush

5.1.1 Care should be taken in the selection of brushes depending on the nature of work and the nature of material to be applied and standard of performance and economy.

5.1.2 A brush of the correct type and size should be used in the respective job; for instance in painting curved and rounded job, corrugated sheets or rods and pipes an oval type of brush is preferable to a flat type of brush. Similarly for painting grooves or narrow channels a flat brush of slightly smaller size or alternatively a sash tool type of brush of requisite size should be used. In case of rough surface a brush with coarse filling materials should be used.

5.1.3 *Cement* — Cements based on shellac are satisfactory for use in some oil paints but they do not withstand denatured spirit or alkali. Glue which is rarely used as setting cement, is satisfactory for some varnish and denatured spirit, but may not be suitable for aqueous media. Pitch setting brushes should not be used with paints containing solvent like naphtha, oil of turpentine, petroleum hydrocarbon solvents. Vulcanized rubber setting is considered to be the best of all for all purposes as brushes with this type of setting can stand all types of solvent used in paints. Next best is cement based on epoxy resin.

5.1.4 *Filling Material* — Brushes filled with bristles or animal hair or both should not be used in alkali, incompletely slaked lime, hot lime wash, etc., or in tar, as alkali causes brittleness. For stripping or cleaning old paint from the surface, the application of alkali, such as soap is necessary; then brush filled with vegetable fibre or nylon brush may be used. Alternatively, if the same is not readily available worn out stump of a condemned brush may be used.

5.1.5 *Painting* — Attention is also to be paid for the proper use of a brush; for instance the use of flat brush edge way should be avoided as far as practicable. For stencilling purpose none other than stencil brush should be used.

5.1.5.1 While in use, not more than half the length of the filling material from the tip end of the paint brush should be immersed in the paint. All possible care should be taken to control the flow of paint into the heel of the brush, since it is difficult to remove the paint from the heel and the paint that builds up there ultimately imparts a tendency to deform the shape of the brush. Thus after withdrawing the brush from the paint can, the major quantity of the paint should be dragged down to the lip end of the brush by the process of 'press and pull' against the rounded edge of the paint can or against the round rod kept diametrically over the paint can, before application of the paint on the surface to be painted. In cases like painting the ceiling of a room or a carriage body, when it is not possible to check the running of paint down to the heel, a thorough rinsing of the brush by dipping beyond the heel in the respective solvent, immediately after painting (before the paint at the heel gets a chance to set) should be done.

5.1.5.2 At the time of application of paint the brush handle should make an angle with the surface of the job, varying from 45° to 90°, with a pressure, so that the filling materials make an angle roughly of about 20° to 25°. In finishing stroke the handle angle will vary from 45° to 90° while the angle made by the filling materials increase from 20° / 25° to 90° as the brush moves towards the end of the stroke with the gradual release of pressure. This will help to get a better performance and longer life of the brush. Brushing should always be straight to and fro stroke and never rotary stroke as in the latter case damage may occur to filling materials due to twisting.

5.1.5.3 *Use of brush, stencil* — In this case the paint which is generally in the form of paste, should be taken just on the lip of the filling material and applied by straight vertical stroke. To avoid spreading of filling materials and to avoid the paint setting at the heel, bridling twin up to the middle of the protruded length of the filling material from the ferrule end is preferable. This bridling will however be removed gradually by wearing. In this case also rotatory movement should be avoided to guard against deformity of filling material due to twisting.

5.1.5.4 For the use of artist brush the procedure recommended in IS 1103 is preferably to be followed at the time of drawing the paint from the palette.

5.1.6 *Breaking-in* — Most of the brush manufacturers have started bevelling the filling materials of the brushes to provide the desired shape for direct use, yet it is advisable that a new brush should be used after proper oiling as described in 4.4 for 20 hours to 25 hours for application of heavy pigmented paint, primer, filler or undercoating paint in order to smoothen the roughness of new bristles or hair.

5.1.6.1 Distemper brushes are best broken in relatively rough surfaces.

5.1.7 *Rough Surfaces* — In case of painting rough surfaces, old, worn out brushes are economical.

5.1.8 Brushes once used in any type of paint shall not be used in any other type of paint without cleaning thoroughly. In using the brush for application of paint of the same type but different shade or colour, the same restriction holds good. However, in emergent situations, a brush used in light colour paint may be allowed for use in deep colour of the same type or same group of paint and not the reverse. In such case also the brush should be thoroughly rinsed in the deep colour paint before application of paint on the surface.

6 CARE AND MAINTENANCE OF BRUSHES AFTER USE

6.1 Cleaning

6.1.1 All types of pan set paint brushes shall be cleaned, right up to the heel immediately after use. No time should be allowed for the paint to set in any part of the filling material including the heel. This is of prime importance in the case of quick drying paints like cellulose paint or synthetic paint or even stoving paint (which are not quick drying in air). This step should be followed even when a brush will not be required within 15 minutes after use (especially in case of cellulose and stoving paints).

6.1.2 Cleaning Liquid

Cleaning liquid for a used brush shall basically be the solvent or thinner present in the paint used with it, for example:

- a) In case of oil base paint and enamel — white spirit (petroleum hydrocarbon solvent).
- b) In case of cellulose paint — cellulose solvent.
- c) In case of shellac varnish — denatured spirit.
- d) In case of emulsion paint — water.
- e) Coal tar solvent naphtha (if this is the solvent present in the paint).
- f) The thinner used in the manufacture of the lacquer or varnish present in the paint (such thinners should be obtained from the manufacturer).

NOTE — In case of coal tar solvent naphtha do not allow the brush to stand for a long time.

6.1.2.1 If the type of solvent present in an oil paint, a varnish or an enamel is not known and if the paint manufacturer has not specified the type of solvent to be used for cleaning, then petroleum hydrocarbon solvent shall be first tried and if this fails, a light coal tar solvent naphtha or xylene should be used.

6.1.2.2 Brushes used in a water-based paint, oil-bound distemper, washable and non-washable distempers, whitewash, etc., shall be cleaned in water. If bristle or hair filled brush has been used, it shall be washed in luke warm soap water and rinsed in clean water in which a little vinegar has been added. A synthetic detergent may also be used in place of soap.

6.1.2.3 Emulsion paints are a type of water paint. Brushes used with them shall be washed in water immediately after use, since the dried paint film is insoluble in water. Brushes shall be immersed in water when not in use during application.

NOTE — Recommendation should be sought from the manufacturer for the cleaning solvent to be used in cleaning brushes used in such paint.

6.1.2.4 Care shall be taken, when a brush is kept immersed in water, to remove all water before using the brush. If the brushes are soaked then they should be suspended to avoid deformation.

6.1.3 Storing Overnight

If the type of paint being applied is an oil base one and the brush will be required for use with the same paint on the following day, it should be kept suspended in a bath containing raw linseed oil and white spirit in the proportion of 50 : 50 in the manner stated in **4.4** after thorough rinsing in the respective thinner. Otherwise, it is advisable to wash the brush with soap water and thorough rinsing in water, after the removal of paint by the respective thinner after work. Care should be taken to see that the last traces of paint have been removed from the filling materials of the brush. The brush shall then be dried, if possible, by a blast of hot air, and kept in dry place.

6.1.4 Removing the Residue

The brush shall be cleaned right up to the ferrule using a stub of a worn out brush, a strip of wood or a steel comb to remove most of the residue. While using the steel comb care should be taken that mechanical damage to the

filling material is avoided. The remainder of the residue shall be removed by working the filling material in luke warm water containing a neutral soap or a synthetic detergent. Several changes of washing liquid are required for cleaning. It shall be rinsed well in clean water and dried.

6.1.5 In case of artist brush or lettering brush, after thorough removal of paint by rinsing in the respective thinner, moisten the filling materials with liquid paraffin or tallow or grease and draw them to form the shape indicated in Fig. 1 of IS 1103 or IS 1104 as the case may be and store it till the same is required for use. Care should be taken in removing the paraffin, etc., by washing thoroughly in white spirit before use.

6.1.6 In case of shaving brush, wash the filling materials thoroughly in water (preferably in luke warm) to remove last traces of shaving soap, dry it and store for the next use, after rolling in a dry tissue paper. This will help against any contamination as well as deformity.

6.2 Drying

If a brush has been washed in water, it is essential that it is thoroughly dried before it is put away or oiled or put into use in a non-aqueous medium. Shake the brush well, wipe with a warm dry cloth and hang it up to dry. Brushes shall not be allowed to stand on their filling material, but shall be supported either with some kind of clip or by a wire threaded through the handle.

6.3 Storing

6.3.1 General — If the filling material of a brush is in proper shape and alignment, wrap the same with oil paper and store. Otherwise moisten the filling material with a mixture of raw linseed oil and white spirit in the proportion of 50: 50, comb them to bring to proper shape and alignment and store in a bath containing raw linseed oil and white spirit as stated in **4.4**. In case this bath is not available, and there is deformity in the filling material, then it is preferable to moisten with some non-drying oil soluble in white spirit, comb them to bring in alignment and shape and wrap with oil paper before storing.

NOTE — Do not store pitch set brushes with naphthalene or with *p*-dichlorobenzene which destroy the setting.

6.3.2 Stencil brushes shall be bound with thin paper and string to preserve their shape.

6.3.3 Artist brushes and lettering brushes should be stored after use as indicated in **6.1.5**.

6.4 Handles

After use the handle shall be cleaned as far as possible by using a suitable solvent which shall be wiped with a clean dry cloth.

7 RECONDITIONING

7.1 If all the care as has been enumerated is observed it may never be necessary to salvage a brush. However, the following information will serve as a guide in case of necessity.

7.2 Use of Solvents

Solvents shall be tried before any other method. Denatured spirit, petroleum hydrocarbon solvent, oil of turpentine or lacquer thinner shall be used for soaking according to the medium present as a hard residue in the brush. Carbon tetrachloride, benzole, toluene, coal tar, solvent naphtha and trichloroethylene shall not be used as these may attack the cement. A very quick wash in methylene chloride is often quite effective. If lacquer thinners have to be used because other solvents are ineffective, then the time of immersion shall not be longer than is necessary to soften the residue. Otherwise the brush shall be soaked in solvent for two days and the filling material worked with fingers from time to time to loosen the residue. The residue shall be worked out with a strip of wood working from heel to tip. To remove hardened emulsion paints, acetone (*see* IS 170), or denatured spirit may be used. A quick wash followed by a quick rinse is sometimes effective.

7.2.1 The brush shall not be left in the paint to remove a hardened residue of the paint.

7.2.2 If any of the solvents discussed in **7.2** fail to remove the hard residue, alkali may be used. In such cases, the alkali solution used shall be cold. The brush shall be soaked in weak alkali solution until the residue softens and then worked out with a piece of wood. Several rinsings with cold water are necessary to remove all traces of alkali.

NOTE — A number of products are available for this purpose; in each case the manufacturer's instruction shall be strictly followed.

7.3 Cleaning

When hardened residue has been removed or loosened the brush may be washed in warm (not hot) water containing a soap or a synthetic detergent. One hundred grams of soap powder in four litres of water is adequate. An old wash board or other board standing in a tub of water may be used. The brush is scrubbed edgeways along this board until the corners are softened and then with the fingers. Extra soap powder on the board may help with stubborn cases.

7.4 Drying

The brush shall be rinsed well in cold water, combed to align and hung up to dry.