REVIEW ANALYSIS OF INDIAN STANDARD

(To be submitted to the Sectional Committee)

1. **Sectional Committee No. & Title:**Building Construction Practices Sectional Committee CED 13

2. **IS No: IS : 4597-1968**

3. **Title: Code of Practice for Finishing of wood and wood based products with nitrocellulose and cold catalysed materials**

4. **Date of review:**

5. **Review Analysis**

i) Status of standard(s), if any from which assistance had been drawn in the formulation of this IS.

Standard (No.& Title)	**Whether the standard has since been revised**	**Major changes**	**Action proposed**
INTERIOR DESIGN/ Useful tips on painting wood/ SICO/ Better Homes & Gardens/ How to Use wood filler for projects and repairs	No	4. PREPARATION OF WOOD FOR FINISHING	New Addition 4.1 Cleaning: First of all, make sure the wooden surface is free of dust, dirt and residues of old paint or finish. Use a damp cloth with mild soap to clean the surface and remove any impurities. 4.2 Sanding: Sanding serves to remove imperfections on the wood surface. It is also used to roughen surfaces too glossy for paint or filling compound to adhere easily. Sandpaper are the most commonly used abrasive materials for this purpose. If the wood has holes, cracks

			or abrasive sponges, sanding is done to smooth out any rough edges and ensure the paint adheres evenly. It can be performed by hand or with electric tools. Sanding should be done evenly to void marks or unevenness. 4.2.1 Tools and products for sanding: 4.2.1.1 Steel Wool: Steel wool is used for cleaning, stripping and polishing wood surface. It can be used in case of water based or micro porous surfaces. Other types of steel wool leave traces that could imbed themselves in the wood and rust on contact with water. 4.2.1.2 Types of steel wool: i). The degree of roughness in steel wool range from extra-coarse(No.4) to extra-fine (0000). ii). Very coarse wool (No 3) is used to smooth rough surfaces and remove varnish or paint during stripping. iii). Coarse wool (No 2) is used to remove old paint and rust.

			When soaked with solvent, it easily removes grease and wax. iv). Fine wool (No 0) is used to clean painted surfaces, trim and floors. v). Extra-fine wool (No 0000) is used to rubdown paint, varnish and shellac before applying a final coat. It also serves to polish surfaces and give them a satin finish. 4.2.1.3 Sandpaper: Sandpaper consists of grains of aluminium oxide, emery, garnet or silicon carbide glued to a backing. This backing may be paper, cloth, fibre, plastic or a combination of paper and cloth. The grains may be open or closed. Closed grains crush more easily during use. Sandpaper comes in sheets, belts and disks in various grades of coarseness. The coarseness of certain types of sandpaper is graded from 12 to 600. The higher the number, the smaller the grains.

			4.2.1.4 Grades of Sandpaper: • Coarse • Medium • Fine The type of surface and its condition determine which grade should be used. Coarse paper is used to make rough surfaces smooth as quickly as possible. Finer paper is used to eliminate traces of the coarser grades. 4.2.1.5 Main types of sandpaper: i).Aluminum oxide: ii).Silicon carbide iii).Emery iv).Garnet
Better Homes & Gardens/ How to Use wood filler for projects and repairs		5. FILLING	New Addition 5.1 Wood Filler: Wood filler is best for larger holes and blemishes since it can be sanded and painted once dry. Thick fillers are best for large cracks or holes. Thin fillers are used to fill small holes when a smooth finish is desired. Wood filler is a hardening substance used to fill imperfections in wood surfaces. The

			solution often consists of tiny wood fragments suspended in water or petroleum based binder. 5.1.1 Types of wood filler: i). Water-based wood filler: The dry or hardening time of this filler is slow. ii).Petroleum-based wood filler: The dry or hardening time of this filler is fast. iii). High-performance wood filler: The dry or hardening time of this filler is fast. 5.1.2 Equipment Needed for wood filler: 5.1.3 i). Stiff putty knife ii).Tack cloth iii).Vacuum iv). No. 220-grit sanding block/ Orbital sander 5.1.3 Material for wood filler: i). Water or Petroleum based or Solvent based wood filler: Water based wood filler is suitable for indoor work whereas petroleum based is used for outdoor work due to best weather protection quality. ii). Rag

			iii). Cleaning solution 5.1.4 Application of wood filler: Step 1: Preparation of surface: Before attempting to fill the material, prepare the surface. Sand away any rough edges and remove all dust and debris. Step 2: Mix Wood filler: Use a small, stiff putty knife to mix wood filler in its container until it is thoroughly combined and has a consistent texture and colour throughout. Step 3: Fill the void: Use the putty knife to smear the wood filler into the void, careful not to scratch the wood surface. Build the filler gap above the wood surface to account for shrinking as it dries, but refrain from applying too much wood filler as this will drastically increase the time spend on sanding. Let the filler dry according to manufacturer's instructions. Step 4: Sand the filler: Ensure the wood filler has completely hardened, sand it until, it is flush with the wood surface. Sanding by

			hand is recommended, but a power sander is an option if the wood filler is too hard. For more sanding control, opt for higher grit, like No. 220. Once the wood surface is reached, sand in the direction of the wood grains to better match the wood's surface. Step 5: Finishing: Sanded wood filler tends to leave plenty of dust behind, so remove it with a vacuum followed by a tack cloth before applying the finish. 5.2 Wood Putty: Wood putty is applied to wood after it is stained or finished. It is more flexible than wood filler. It is perfect, when there are very small holes to repair such as when nails has been removed. The dry or hardening time of this filler is slow. There are three common types of wood putty. • Nitrocellulose-based Putty: It takes about 5 to 10 minutes to dry and needs to be cleaned with acetone or lacquer thinner. • Water-based Putty: It takes up to 24 hours to dry and can be cleaned using water. • Oil-based Putty: It takes upto 48 hours

			to dry and needs to be cleaned with oil solvents like turpentine.
Rise/ Emperor PAINT		6. SEALING	Addition in existing 6.0 Sealing: Sealing is a good way to prolong the life and wear of wood for a long time. Since the wood has some natural vulnerability because of its porosity and inherent water content. 6.1.1 Wood sealer: A sealer is a product that coats the wood in order to provide a layer of protection. Sealers effectively block the pores of the wood from becoming altered due to moisture or chemical reaction. 6.1.2 Non-Toxic wood sealer: Non-toxic wood sealers are natural or planet-friendly alternatives to conventional wood sealers that contain harmful chemicals. They are made from natural materials such as plant oil, beeswax and water based resins. Some Non-toxic wood sealers may also have low levels of volatile organic compounds (VOC), which are less harmful than conventional sealers. The main reason to use Non-toxic wood sealers

			is to protect health and environment. Non-toxic wood sealers are safe to use and environmentally friendly. 6.1.3 Types of Non-Toxic wood sealer: i). Water-based sealers: These are made from water based resins and are the most environmentally friendly option. They are easy to apply, dry quickly and do not emit harmful fumes. However, they may not be as durable as oil-based sealers and require more frequent reapplications. ii). Oil-based sealers: Oil-based sealers are made from plant oils such as linseed or Tung oil. These sealers are durable and offer excellent protection against moisture and ultra violet rays. However, they may emit harmful fumes during application and require longer drying time. iii). Wax-based sealers: Wax-based sealers are made from natural waxes such as beeswax or carnauba wax. They offer good protection against moisture and are easy to apply. However, they may require more frequent reapplication and may not be as durable as other sealers.

			iv). Shellac-based sealers: Shellac-based sealers are made from natural shellac- a resin from the female lac bug. It is quick drying and provides a hard finish. It is easy to repair because old layers of shellac can be removed with alcohol. Shellac is prone to damage from hot pans and water, so it is not a top choice for kitchen and bathroom. 6.1.4 Preparation of surface for sealing: i). Check the moisture content of the wood: Sealing the wet wood is a recipe for failure, as the sealant would not adhere to wood. Exterior wood surfaces should have at most 15-20 % moisture content while interior wood should have moisture content between 12-15 %. It can be judged by means of moisture meter. ii). Seal all knots: In case of bare wood, prime all the knots with a shellac-based primer. iii). Fill the cracks: Use a high-grade interior or exterior grade wood filler to seal any visible cracks or holes in the wood. iv). Sand the wood: Finally, use 150 grade

			to 220 grade sandpaper and sand in the direction of the wood grain. Going against the grain could lead to scratches that will absorb stain or sealant unevenly. 6.1.5 Application of sealer: After having prepared the wood surface by sanding and cleaning, it will be ready to apply the sealant. Use high-quality brushes or rollers. If water-based polyurethane are used, do not stir too harshly, as this could lead to bubbles. Also, only put more sealant on the brush if necessary and do firm, long strokes following the wood grain. Wait to apply a second coating or paint over the same area until it completely dries.
Reader's Digest/ Martha stewart/AD IT YOURSELF/Bona/How to stain wood: A Step-by-Step guide to staining wood/ MELANATED MAKER DIY/		8.STAINING	Addition in existing 8.0 Staining: Wood staining involves applying a coat of stain to a freshly sanded wood surface to transform the colour of the wood or emphasize the wood grain. 8.2.1 Types of stains namely: i). Oil-based stains: The most common type of stain is oil-based water-based stains. In case of hard

			wood such as oak or maple, an oil-based stain is ideal. Oil-based stains bring out the intricacies of the wood grain and are more common choice among professional woodworkers. Oil-based stains have longer dry time, a strong odour, require mode sanding and are slightly more difficult to clean up. With proper ventilation, the right tools and a little elbow grease, oil based stains can yield an impressive result. ii). Water-based stains: In case of soft wood such as pine or cedar, water-based stain is a great choice. Water-based stains are fast-drying, have a low odour and are easy to clean. iii).Gel –based stains iv).Spirit (Alcohol) based stains: Spirit-based stains being the fastest drying usually in about 15 minutes. 8.2.2 Process of staining of wood: • Sand the wood • Stir the stain • Apply the stain

			• Wipe off excess stain • Let the wood dry before applying a sealer • Clean up 8.2.3 Materials needed to stain wood: i). Pre-stain wood conditioner: Woods that are soft or porous such as pine or cherry require a thin coat of pre-stain wood conditioner before staining to avoid blotchiness. ii). Stain: With a variety of stain options, choose the stain type and colour. Now test the stain on a scrap piece of wood first. In case of staining the pine wood, consider using a gel stain to avoid blotches caused by uneven absorption. iii). Sandpaper: Sandpaper of grade 120,180 and 220 grit are required to complete the job. iv). Tack-cloth: A tack cloth is a sticky cloth used for wiping away dust between sanding and staining. v). Stain Applicator: Depending on the type of stain used, this will need either a natural bristle paintbrush, foam brush or a clean rag to

			apply the stain. vi). Lint-free cloth: Use a lint-free, clean cloth for wiping away excess stain. v).Drop cloth: Place a drop cloth to protect the floor from drips and oil stains. vi). Mineral spirits: Use mineral spirits to clean oil-based stains out of brushes. v). Wood sealer: Wood sealer is optional as it will help to protect it from scratches and wear. Consider finishing with a top coat of polyurethane. vi). Power sander: Power sander is optional which depends on the size of job. Small pieces of furniture or trim can be sanded by hand or with a sanding pad. 8.3.1 Water stains are the result of moisture penetrating a wood's protective finish. This happens with both cold and hot items, but the process of dealing with them are the same. Water stains are of two types namely White water stains and Dark water stains. White water stains means the moisture is trapped in the finish layer of wood. A dark water finish

			means that the moisture is already affecting the wood itself. Water stains can be removed by • Using dry heat (Iron/hair dryer) • Using oil (Mayonnaise/ petroleum Jelly) • Using Mild Abrasives (Toothpaste/Baking soda/ Salt) 8.3.2 Spirit Stains: Spirit stains are methanol based to make them quick drying and because of this they also will not raise the grain of the timber they are applied to. Spirit stains can be applied by cloth, brush or spray, which includes spray diffusers, airbrush and spray gun. Take care to mask off any areas that is not required to be colour. Spirit stains is used by stirring the contents well and always check the shade before application. Take a clean, lint free cotton cloth or sponge and apply in the direction of the wood grain where possible. Take care to remove any excess stain immediately with a separate, clean absorbent cloth, again following the direction of the grain pattern.
LONE STAR		9. FINISHING	Addition in existing

GUITARS			9.0 FINISHING Lacquer is a wood finish typically made with a solution of niotrocellulose and solvents to make a glossy or matte coating. Frequently sprayed on, it leaves a thin coat dries faster than other finishes. It is ideal for furniture, but it is not recommended for use over old paint or varnish. It is more durable than shellac and is considered one of the best wood sealants. It can give off strong fumes when applied, so apply in a well-ventilated area and take necessary precautions. 9.1 Nitrocellulose lacquers have been used as a finish on furniture and musical instruments. Guncotton, dissolved at about 25 % in acetone, forms a lacquer used in preliminary stages of wood finishing to develop a hard finish with a deep luster. Nitrocellulose is considered to be more porous than polyester or polyurethane, with a thin, smooth and somewhat slippery texture that is not as solid or constrictive. 9.1.1 Nitrocellulose finishing include the

			following process: i). Collection of material: • Grain filler • Grain filler spreader leveler • One cane nitrocellulose sanding sealer aerosol • One cane nitrocellulose primer aerosol • One cane nitrocellulose colour aerosol • One cane nitrocellulose clear gloss aerosol • Tack cloth • Sandpaper in various grits (P400, P800, P1000, P1500, P2000 or 320, 400, 600, 800 and 1000 grit for US) • Sanding block • Mineral spirits (for cleaning) • Polishing cloth • Polishing compounds • Spray mask ii). Preparing the wood • Sand the bare wood until smooth and free from any imperfections (dents, bumps

			etc.). Use P400/320 grit sandpaper. • Raise the grain with a damp cloth and let dry. • Sand again using P400/ 320 grit sandpaper. • Round over any sharp edges iii). Filling the wood grain (if necessary): • This step is only necessary for open grained woods such as Mahogany, Ash and Rosewood. Alder Basswood and Maple do not require grain filling. • Using a grain filler and spreader leveler, fill the wood grain. Let dry overnight. • Sand using P400/320 grit until smooth. Inspect for any unfilled grain. • Most surfaces will require 2 to 3 applications. • Inspect the surface thoroughly. It should be perfectly flat and smooth before

			continuing to the next step. • Sand using P800/ 400 grit sandpaper until smooth. iv). Sanding sealer: • Clean/ grease the surface using mineral spirits and a cloth. When it is dry, remove any dust or dirt using a tack cloth. • Seal in the grain filler using a nitrocellulose sanding sealer. A total of 2-3 coats is sufficient. Wait a minimum of 20 minutes between coats. Let dry overnight. • Inspect the surface thoroughly for unfilled grain and other imperfections if needed. • If sanding is needed to correct imperfections, sand very lightly using P800/ 400 grit sandpaper. Clean the finish using mineral spirits and a cloth. Apply additional coats

			of sealer as needed. • It is not necessary to sand in between the sanding sealer and colour/ clear coat if no imperfections are present. v). Applying the primer (if necessary): • In case of natural/ transparent finish, this step is not required. In this case apply the clear coats directly after the sanding sealer. • Inspect the surfaces for imperfections again. It should be perfect. If this is not perfect go back to the step (iii) or even step (ii) if this is not the case. • Clean / degrease the surface using mineral spirits and a cloth. When it is dry, remove any dust or dirt using a tack cloth. • Apply the primer coats. A total of 2-4 coats are

			sufficient. Wait a minimum of 20 minutes between coats. Apply a maximum of 3 coats each day. • Sanding between two coats is not necessary, unless there are drips, runs, blushing or other major imperfections in the finish. • If sanding is necessary, sand lightly using P1000/ 600 grit sandpaper. Wet sanding is recommended. Apply subsequent coats if necessary. • Inspect the surface thoroughly for imperfections, dust particles and other contaminants. vi). Apply the colour coats (if necessary): • In case of natural/ transparent finish, this step is not required. In this case apply the clear coats directly after the

			sanding sealer. • Clean/ degrease the surface using mineral spirits and a cloth. When it is dry, remove any dust or dirt using a tack cloth. • Apply the colour coats. A total of 2-4 coats is sufficient. Wait a minimum of 20 minutes between coats. Apply a maximum of 3 coats each day. • Sanding between two coats of colour is not necessary, unless there are drips, runs, blushing or other major imperfections in the finish. • If sanding is necessary, sand lightly using P1000/ 600 grit sandpaper. Wet sanding is recommended. Apply subsequent coats if necessary. • Inspect the surface thoroughly for imperfections,

			dust particles and other contaminants. vii). Applying the clear coats: • Sanding between the colour and clear coats is not necessary, unless there are drips, runs, blushing or other major imperfections in the finish. • Clean/ degrease the surface using mineral spirits and a cloth. When it is dry, remove any dust or dirt using a tack cloth. • Apply 6-10mcoats of clear lacquer. Wait at least 20 minutes between coats and apply a maximum of 3 coats each day. • Inspect the surfaces thoroughly for imperfections or dust particles in the clear coat. Correct if needed. • Let dry for at least 4 weeks. viii). Sand and polish:

			• After allowing the finish to dry/ harden for a minimum of 4 weeks (preferably leave it for 6-8 weeks) . It's time to sand and polish the finish. • Wet sand the finish with P1500/ 800 grit sandpaper. The surface should have a uniform milky look. Shiny spots indicate low spots which need additional sanding. • Wet sand the finish with P2000/1000 grit sandpaper to remove the P1500 scratch marks. The finish should already be very smoothy and slightly glossy by now. • Polish the finish using a polishing cloth and various compounds. Depending on the brand and type of polishing compound, start with a coarse or medium compound and

			work upto the fine or ultra fine compound.
FineWoodworking		10.PULLING OVER	Addition in existing 10.0 Pullover is a specially formulated product for rubbing out nitrocellulose lacquer. No expensive tools are required. This technique calls for a pad similar to that used in French polishing. The cotton wadding, dry or soaked in the liquid pullover first, is wrapped in soft denim and then used as the actual polishing tool.
Matmatch		11. BURNISHING	Addition in existing 11.0 Burnishing is a finishing technique that is used on wood. It gives the wood a smooth, shiny finish similar to the appearance achieved when using polyurethane or lacquer. Burnishing wood involves rubbing the surface of the wood with a smooth, hard object to create a polished finish. This technique compresses the wood fibres, resulting in a smooth and glossy surface. Burnishing can be done using specialized tools like burnishing rods or simply with a smooth piece of wood.

ii) Status of standards referred in the IS

Referred standards (No. & Title)	IS No. of this standards since revised	Changes that are of affecting the standard under review	Action proposed

iii) Any other standards available related to the subject & scope of the standard being reviewed (International/regional/other national/association/consortia, etc or of new or revision of existing Indian Standard)

Standard (No. & Title)	Provisions that could be relevant while reviewing the IS	Action proposed

iv) Technical comments on the standard received, if any

Source	Clause of IS	Comment	Action proposed

v) Information available on technical developments that have taken place (on product/processes/practices/use or application/testing/input materials, etc)

Source	Development	Relevant clause of the IS under review that is likely to be impacted (Clause & IS No.)	Action proposed

vi) Issues arising out of changes in any related IS or due to formulation of new Indian Standard

Related IS	Provision in the	Changes that may	Action

and its Title (revised or new)	IS under review that would be impacted & the clause no. or addition of new clause/provision	be necessary in the Standards under review	proposed

vii) Any consequential changes to be considered in other IS

Related IS to get impacted	Related IS Title	Requirements to be impacted

8 Any other observation:

9 Recommendations:

To refer the following segment for the proposed for the proposed changes marked in red.