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*Indian Standard*

CODE OF PRACTICE FOR  
THE PREPARATION AND APPLICATION OF  
PUTTY FOR REPAIRING PLYWOOD AND  
OTHER WOOD BASED PANELS

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
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# Indian Standard

## CODE OF PRACTICE FOR THE PREPARATION AND APPLICATION OF PUTTY FOR REPAIRING PLYWOOD AND OTHER WOOD BASED PANELS

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# *Indian Standard*

## CODE OF PRACTICE FOR THE PREPARATION AND APPLICATION OF PUTTY FOR REPAIRING PLYWOOD AND OTHER WOOD BASED PANELS

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Bureau of Indian Standards on 28 May 1987, after the draft finalized by the Wood Products Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** Putty is extensively used by plywood, furniture and other wood based industries. This code of practice has, therefore, been formulated to cover the type of putty, its formulation, quality requirements and method of application.

**0.3** 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.

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### 1. SCOPE

**1.1** This standard prescribes the requirements and the characteristics of putty based on nitrocellulose or urea formaldehyde resin for use in repairing plywood and other wood based panels.

### 2. TERMINOLOGY

**2.1 Putty** — Pasty material used to repair the cracks, splits or holes in the plywood or wood based panels which sets on application on the panels.

**2.2 Setting Time** — The time taken for the putty to convert itself into a cohesive mass which meets the requirements after a specified time.

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

**2.3 Filler/Extender** — An inert substance, such as wood flour, talc, gypsum and china clay which is added to alter the characteristics of the putty.

**2.4 Pot Life** — The time between the mixing of the constituent parts of a putty and its reaching the age when it is no longer usable.

**2.5 Nitrocellulose Putty** — A nitrocellulose putty is prepared using nitrocellulose 20 sec and nitrocellulose 1/2 sec thoroughly mixed with organic solvents and finally mixed with fillers and pigments so as to match the colour of panel.

**2.6 Urea Formaldehyde Resin Based Putty** — Urea formaldehyde resin putty is prepared by mixing the powder resin with fillers, pigments and organic solvents. To the final mix, catalyst like ammonium chloride or ammonium sulphate is added to enable this putty to set on the panel.

**2.7 Putty Based on Urea Formaldehyde (UF) Modified with Polyvinyl Acetate (PVAc) Emulsion** — Putty based on urea formaldehyde modified with PVAc is prepared by mixing either powder UF resin dissolved in water or UF resin solution of about 50 percent solids with filler/extender and a catalyst like ammonium chloride or ammonium sulphate.

### 3. REQUIREMENTS

**3.1 Form and Condition** — The putty shall be a homogeneous paste and shall be free from grit and visible impurities.

**3.2 Consistency** — The putty, after thorough working in hand, shall have good plastic quality without sliminess or stickiness that would render it difficult to handle and apply.

**3.2.1** In addition, it shall work readily and smoothly under flexible metallic knife without crumbling. After being applied on the panel surface and after setting, it shall remain as a cohesive mass and shall not shrink or crack and shall remain on the surface of the panel without any deformation when subjected to cold water soaking for 24 hours. It shall set within 30 to 120 minutes at ambient temperature from the time of its application on the panel. It shall be abrasion resistant at par with the panel surface.

**3.2.2** It shall remain permanently on the panel surface and shall not split or crack or come off from the surface while the panels are handled during transportation and use.



**3.2.3** Repaired area of the panel shall not crack or split on nailing or screwing.

**3.2.4** It shall be possible to crush the nitrocellulose putty or UF resin putty base if caked in container or remixed with solvents, if evaporated.

**3.3 Paintability** — Surface of the putty repaired area of the panel shall be easily paintable with spirit, varnish, oil varnish or paints.

## 4. MATERIALS

**4.1 Nitrocellulose** — Nitrocellulose shall be ester soluble of viscosity 15-20 seconds and E. S. 1/2 seconds.

**4.2 Urea Formaldehyde Resin** — Urea formaldehyde resin shall be in powder or solution form and shall meet the requirements specified in IS : 848-1974\*.

**4.3 Solvents** — Solvents used for the preparation of putty shall be acetone and/or methyl or ethyle alcohol and should not contain impurities which effect the properties of the putty.

**4.4 Fillers/Extender** — Fillers shall be of size specified in 5.1(a) and 5.2(b). Extenders shall meet the requirements specified in IS : 1508-1972†.

**4.5 Pigments** — Mineral pigments in a range of shades to match the plywood and the wood panels of any colour.

**4.6 Catalysts** — Catalyst for UF resin based putty shall be either ammonium chloride or ammonium sulphate.

## 5. PREPARATION OF PUTTY

**5.1 Formulation for Nitrocellulose Putty** — Nitrocellulose based putty formulation consists of two stages: (a) preparation of putty and (b) colouring of putty.

a) *Preparation of Putty* — The following ingredients are mixed to obtain a smooth paste:

<i>Ingredients</i>	<i>Parts by Weight</i>
Acetone	80
Methanol	40

\*Specification for synthetic resin adhesives for plywood ( phenolic and aminoplastic ) ( first revision ).

†Specification for extenders for use in synthetic resin adhesives ( urea formaldehyde ) for plywood ( first revision ).

<i>Ingredients</i>	<i>Parts by Weight</i>
Nitrocellulose 20 Sec	15
Nitrocellulose 1/2 Sec	20
Gypsum ( 45 microns )	60-90
Talc powder ( 45 microns )	60-90
China clay ( 45 microns )	20-30
Wood flour ( 75 microns )	15-20

Acetone and methanol are taken in a container which is fitted with a stirrer fixed to a heavy duty dust proof and flame proof motor. The nitrocellulose ( NC ) 20 Sec is slowly added with constant stirring followed by NC 1/2 Sec. Stirring is continued till a homogeneous solution is obtained. To the resultant solution, gypsum, talc, china clay and wood flour are added and mixed thoroughly to get a homogeneous paste. The smooth paste so obtained, shall be preserved in an airtight container for further processing. The putty prepared shall have a pot life of about one week.

- b) *Colouring of Putty* — General mineral pigments suitable for colouring the putty are raw sienna, burnt sienna, turkey amber, ferric oxide, titanium dioxide, zinc oxide. The use of sand or dust or wood flour of particular species helps in reducing the quantity of pigments mentioned above. Suitable pigments and wood flour are mixed with putty and the coloured putty so obtained is stored in sealed containers.

**5.2 Formulation for Urea-formaldehyde ( UF ) Putty** — UF based putty formulation consists of three stages: (a) Preparation of putty base, (b) colouring of putty base, and (c) addition of catalyst to the putty base.

- a) *Preparation of Putty Base* — The ingredients mentioned below are mixed in powder form and then mixed with acetone and stirred thoroughly to obtain a putty base. The putty base shall have a pot life of about one week.

<i>Ingredients</i>	<i>Parts by Weight</i>
UF resin powder	100
Wood flour ( 75 microns )	40
Talc powder ( 45 microns )	100
China clay ( 45 microns )	100
Acetone	120-130

- b) *Colouring of Putty Base* — Generally mineral pigments suitable for colouring the putty are raw sienna, burnt sienna, turkey amber, ferric oxide, titanium dioxide or zinc oxide. The use of sander dust or wood flour of particular species helps in reducing the quantity of pigments mentioned above. Suitable pigments and wood flour are mixed with putty and the coloured putty so obtained is stored in sealed containers.
- c) *Addition of Catalyst to the Putty Base* — 100 parts of the putty base is taken and 2 ml of 20 percent ammonium chloride solution is added as catalyst, mixed thoroughly and applied on the plywood surface. The putty prepared by this method shall have to pot life of about 2 hours.

**5.3 Formulation of Putty Based on UF Resin Modified with PVAc Emulsion** — A typical formulation of putty based on UF resin modified with PVAc consists of the following ingredients mixed to obtain a smooth putty.

<i>Ingredients</i>	<i>Parts by Weight</i>	
	I	II
UF resin powder	100	—
Water	100	—
UF resin ( 50 percent solids )	—	200
Polyvinyl acetate emulsion ( 50 percent solids )	100	100
Ammonium chloride or ammonium sulphate	2	2
Water	5	5
Temarind seed powder	150-200	150-200

## 6. METHOD OF APPLICATION

**6.1** A small quantity of putty of appropriate colour shall be transferred as quickly as possible on the surface to be repaired. It shall be then forced into the gaps to be filled using a flexible metallic knife. Putty so applied shall be allowed to dry by keeping it aside, undisturbed. Excess putty shall then be scrapped off the surface with a scraper and the surface sanded.

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