इंटरनेट मानक

Disclosure to Promote the Right To Information

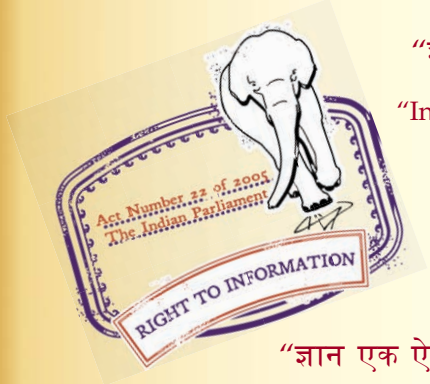
Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 4913 (1968): Code of Practice for Selection, Installation and Maintenance of Timber Doors and Windows [CED 11: Doors, Windows and Shutter]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"



"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

PROTECTED BY COPYRIGHT

IS : 4913 - 1968
(Reaffirmed 2001)

Indian Standard

CODE OF PRACTICE FOR SELECTION, INSTALLATION AND MAINTENANCE OF TIMBER DOORS AND WINDOWS

(Third Reprint MAY 1996)

UDC 69.028.1/.2:691.11:69.001.3

© *Copyright* 1969

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *March* 1969

Indian Standard

CODE OF PRACTICE FOR SELECTION, INSTALLATION AND MAINTENANCE OF TIMBER DOORS AND WINDOWS

Doors, Windows and Shutters Sectional Committee, BDC 11

Chairman

SHRI T. S. NARAYANA RAO

9 Mahatma Gandhi Road, Bangalore *and*
the Institution of Engineers (India), Calcutta

Members	*Representing*
SHRI B. D. AHUJA	National Buildings Organization
SHRI P. C. SHAH (*Alternate*)	
SHRI H. S. ANAND	Anand Industries Ltd, New Delhi
SHRI P. N. ANAND (*Alternate*)	
SHRI D. P. CHATTERJEE	Directorate General of Supplies & Disposals
SHRI R. M. CHAUDHRI	Indian Aluminium Co Ltd, Calcutta
SHRI J. K. ANAND (*Alternate*)	
DEPUTY DIRECTOR STANDARDS (ARCHITECTURE)	Ministry of Railways (Railway Board)
SHRI R. D. GAUTAM	Albion Plywood Co Ltd, Calcutta
SHRI GHULAM QADIR	J & K Industries Ltd, Srinagar
DEPUTY MANAGER (*Alternate*)	
HONORARY SECRETARY	Indian Metal Window Manufacturers Association, Bombay
SHRI N. J. JAL	Godrej & Boyce Mfg Ltd, Bombay
SHRI G. K. DATAR (*Alternate*)	
SHRI G. R. JOLLY	Builders' Association of India, Bombay
DR JOSEPH GEORGE	Central Building Research Institute (CSIR), Roorkee
SHRI T. N. GUPTA (*Alternate*)	
SHRI B. K. KHAITAN	Andamans Timber Industries Ltd, Calcutta
SHRI A. N. KHIRA	Jayanand Khira & Co Private Ltd, Bombay
SHRI K. VENUGOPAL (*Alternate*)	
SHRI L. S. KUMAWAT	Engineer-in-Chief's Branch, New Delhi
SHRI K. S. LAULY	Indian Plywood Manufacturing Co Ltd, Dandeli
MANAGING DIRECTOR	Hindustan Housing Factory Ltd, New Delhi
SHRI K. G. SALVI (*Alternate*)	
SHRI N. J. MASANI	Forest Research Institute and Colleges, Dehra Dun
SHRI J. S. MATHARU	Directorate General of Technical Development, New Delhi

(*Continued on page* 2)

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

(*Continued from page* 1)

Members	*Representing*
SHRI G. M. MEHTA	Standard Rolling Shutters & Engineering Works Pvt Ltd, Bombay
SHRI R. L. CHADHA (*Alternate*)	
SHRI S. K. MULLICK	Hopes Metal Window (India) Ltd, Calcutta
SHRI S. K. BHARGAVA (*Alternate*)	
SHRI M. K. NAG	Federation of Plywood Industry, New Delhi
SHRI THOMAS PAUL (*Alternate*)	
SHRI K. B. PAREKH	Mysore Commercial Union Ltd, Bangalore
SHRI A. K. RAMACHANDRA	Indian Plywood Manufacturers Research Association, Bangalore
SHRI N. VENKATARAMAN (*Alternate*)	
SENIOR ARCHITECT B (1)	Central Public Works Department
SHRI J. D. SHASTRI	Indian Institute of Architects, Bombay
SHRI C. D. SHARMA (*Alternate*)	
SHRI G. R. SUNDERAM	Man Industrial Corporation Ltd, Jaipur
SHRI K. R. ANANTHASWAMY (*Alternate*)	
SHRI H. THOMSON	Plywood Products, Sitapur
SHRI G. W. M. WHITTLE (*Alternate*)	
SHRI S. V. VISWANATHAN	Diana Rolling Shutters and Engineering Works, Calcutta
SHRI R. NAGARAJAN, Director (Civ Engg)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI J. VENKATARAMAN
Assistant Director (Civ Engg), ISI

Indian Standard

CODE OF PRACTICE FOR SELECTION, INSTALLATION AND MAINTENANCE OF TIMBER DOORS AND WINDOWS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 12 December 1968, after the draft finalized by the Doors, Windows and Shutters Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Doors and windows require proper selection to suit the use and skilled workmanship in installation and fitment of accessories like hinges, fittings, etc, and unless the necessary care is exercised it is possible that even a well-manufactured quality door does not give good service in use. Therefore, as an adjunct to the various specifications laid down for timber doors and windows this code for selection, installation and maintenance is formulated. The method of fixing the frames and door shutters has not been rationalized. There are varied practices in different regions by different users. The user is often likely to make a wrong choice about the type of shutters he should buy for a certain use. This standard is based on the practices followed in the country and is intended to guide the user regarding selection, installation and maintenance of timber door and window shutters and frames and with a view to aiding the developing door and window manufacturing industry.

0.3 Quite often doors which are factory-made have to be adjusted with regard to the dimensions for fitting in the openings. This wasteful practice has been eliminated by suitable dimensional co-ordination between the size of opening and the size of doors based on the principle of modular co-ordination and the height and width of the door is now related to the basic opening sizes allowing for suitable tolerances. Installation practices have also to be suitably adjusted so as to achieve satisfactory work within the tolerances which have been allowed for. This code provides guidance in this respect also.

0.4 Every door and window installation presents its own problems and different surround details may require different techniques for installation. Where doors with special arrangements like louvres, vision panels, etc, are to be fixed, a careful study of the drawings and specialized training and skill are called for installation. The work needs to be carried out by qualified and skilled craftsman. Close adherence to the practices detailed in this code will greatly assist in getting the job correctly done.

0.4.1 This code of practice represents a standard of good practice and therefore takes the form of recommendations.

0.5 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

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 code covers the selection, installation and maintenance of timber doors, windows and ventilator frames and shutters for residential buildings, schools, hospitals and other non-industrial buildings.

1.2 This code does not cover industrial doors and windows and fire-proof doors and windows.

2. TERMINOLOGY

2.1 For the purpose of this code, definitions given in the relevant standards for materials and also those given in IS:707-1968† and IS:1081-1960‡ shall apply.

3. MATERIALS AND GUIDANCE FOR SELECTION

3.1 General — For permanent door frames Grade I timber or pressed steel door frames shall be used. For temporary and portable type of door frames the timber may be of Grades I or II.

3.2 Frames — Timber door, window and ventilator frames for residential buildings shall conform to IS:4021-1967§. Pressed steel door frames shall conform to IS:4351-1967‖ (*see* also **3.1**).

3.3 Timber Panelled and Glazed Shutters — Timber panelled and glazed door and window shutters shall conform to IS:1003 (Part I)-1966¶ and IS:1003 (Part II)-1966**.

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

†Glossary of terms applicable to timber and timber products (*first revision*).

‡Code of practice for fixing and glazing of metal (steel and aluminium) doors, windows and ventilators.

§Specification for timber door, window, and ventilator frames.

‖Specification for steel door frames.

¶Specification for timber panelled and glazed shutters : Part I Door shutters (*first revision*).

**Specification for timber panelled and glazed shutters : Part II Window and ventilator shutters (*first revision*).

3.3.1 The thickness selected for door shutters shall be not less than 40 mm for permanent installations. The thickness may be reduced for temporary installations. These, however, would require additional care in maintenance.

3.3.2 For aesthetic and decorative purposes in high class buildings, decorative type of door shutters may be used. The most commonly used decorative surface timber is teak (*Tectona grandis*). These require polishing and waxing as against painting required for commercial door shutters.

3.3.2.1 The user may specify one face decorative and one face commercial (non-decorative) panel door as required for the colour scheme in the room and based on other aesthetic considerations.

3.4 Wooden Flush Door Shutters — These shall conform to IS : 2191 (Part I)-1966,* IS : 2191 (Part II)-1966†, IS : 2202 (Part I)-1966‡ and IS : 2202 (Part II)-1966§.

3.4.1 For permanent buildings wooden flush doors of the solid core or cellular or hollow core type are recommended. For temporary buildings, cellular or hollow core type of flush door shutters may be used.

3.4.2 For aesthetic and decorative reasons in high class buildings, decorative type of door shutters may be used. The user shall specify the timber for the face of the shutter.

3.4.3 The user may also specify one face decorative and one face commercial for the flush door depending on his need for colour scheme in the room.

3.5 Door and Window Hardware — Door and window hardware shall meet the requirements of relevant Indian Standards.

3.5.1 *Selection and Fixing of Hardware* — Each wooden door shutter shall have a minimum of three door hinges and two fastenings like tower bolt, hasp and staple, mortice lock, etc. Floor door stoppers and handles are optional. Swing-damping type of arrangements like hydraulic door closers may be fixed as an optional item. Push plate, name plate, kick plate, etc, are also optional fittings depending on the choice and requirement of the user.

---

*Specification for wooden flush door shutters (cellular and hollow core type): Part I Plywood face panels (*first revision*).

†Specification for wooden flush door shutters (cellular and hollow core type): Part II Particle board face panels (*first revision*)

‡Specification for wooden flush door shutters (solid core type) : Part I Plywood face panels (*first revision*).

§Specification for wooden flush door shutters (solid core type) : Part II Particle board and hard board face panels (*first revision*).

3.5.2 Each window shutter shall have a minimum of three hinges, and one fastening like tower bolt and one handle for opening and closing. Additional fastenings or tower bolts may be provided as optional items.

3.5.3 Selection of door and window hardware shall depend on the economy desired and the climatic conditions. In coastal towns the hardware should be selected keeping in view the resistance of hardware to salty sea winds. For specially heavy doors, additional hinges specially made shall be provided.

3.5.4 The meterial for hardware may be mild steel, brass, oxidized iron, anodized aluminium, etc, and the user has to carefully choose the material to suit his requirements.

3.6 Paints and Varnishes — White lead primer paint, aluminium or other primer, wood filling putty, ready mixed paints, varnishes and polishes and all other materials used for painting and finishing of door and window shutters shall conform to the relevant Indian Standards.

3.7 Glass — Sheet glass used for glazing shall conform to IS : 1761-1960*. The user may also specify the type of glass to be used, such as frosted glass, wired-glass and coloured glass and the requirements for them.

4. INFORMATION REQUIRED

4.1 When placing order for door, window and ventilator frames and shutters, the purchaser (or user) shall give full information to the manufacturer as prescribed in the various specifications for the materials. This also applies to hardware and paint and finishing materials.

NOTE — The following points will determine the type of material for doors and windows to be ordered:

a) The type and nature of buildings whether permanent, temporary or portable;

b) Climatic conditions of the place of use;

c) Architectural consideration and other special requirements like louvres and vision panels;

d) Need for standard sizes and modular consideration; and

e) Availability of materials.

4.1.1 Where special louvres, vision panels, or other special fixtures are required on the shutters, full details shall be given of the same in the order and preferably the drawings should also be provided.

5. SELECTION

5.1 General — For permanent buildings, timber door, window and ventilator frames of Grade I timber or pressed steel door frames shall be used. The shutters for these type of buildings shall also be of Grade I timber.

*Specification for transparent sheet glass for glazing and framing purposes.

For temporary buildings, frames of Grade I or Grade II timber and panelled shutters of Grade I or Grade II timber or flush door shutters of cellular or hollow core type may be used.

5.2 All windows shall be of Grade I timber for permanent buildings and Grade II timber for temporary buildings.

5.2.1 For high class buildings and when required for architectural and aesthetic reasons Grade I type of frames and decorative type of panelled doors or flush doors may be used. For all general purpose buildings non-decorative type door shutters are recommended.

5.3 Choice of Type of Shutter — The choice between panelled doors, glazed doors and flush doors is primarily based on considerations of aesthetic and functional requirements and economy. Where glazing is desired, the shutters may be fully glazed or partly panelled and partly glazed.

5.4 Choice of Type of Fittings — The choice of fittings may be determined by considerations of economy, durability, aesthetic and architectural consideration and also serviceability (*see also* **3.5.1**).

5.5 Selection of Sizes — The sizes of frames and shutters selected shall conform to the standard sizes covered in the relevant Indian Standards.

5.6 Choice of Timber — The choice of timber for door frames and doors may be according to the taste of the purchaser from any of the species specified in the relevant Indian Standards. For termite and insect affected areas and permanent type of buildings durable timbers like teak shall preferably be used for door frames and panelled doors. Timbers treated with preservatives in accordance with IS : 401-1967* may also be used.

5.6.1 For temporary buildings, non-durable timbers and non-decorative finishes may be used. It may not be necessary to specify any particular species of wood as it may increase the cost without any corresponding advantage. All timbers of the particular class will be equally satisfactory.

6. HANDLING AND STORAGE

6.1 General — While unloading, shifting, handling and stacking of timber door and window frames and shutters care shall be taken that the material is not dragged one over the other as it may cause damage to the surface of the material particularly in the case of decorative shutters. The material should be lifted and carried preferably flat and avoiding damage of corners of sides.

*Code of practice for preservation of timber (*second revision*).

6.2 Storage — All wooden frames and shutters shall be stored in a dry and clean covered space away from any infestation and dampness. The storage shall preferably be in well ventilated dry rooms. The frames shall be stacked one over the other in vertical stacks with cross battens at regular distances to keep the stack vertical and straight. These cross battens should be of uniform thickness and placed vertically one over the other. The door shutters shall be stacked in the form of clean vertical stacks one over the other and at least 8 cm above ground on pallets or suitable beams or rafters. The top of the stack shall be covered by a protecting cover and weighed down by means of scantlings or other suitable weights. The shutter stack shall rest on hard and level ground (*see also* IS: 4082-1967*).

6.2.1 Separate stacks shall be built up for each size, each grade and each type of material. When materials of different sizes, grades and types are to be stacked in one stack due to shortage of space, the bigger size shall be stacked in the lower portion of the stacks. Suitable pallets or separating battens shall be kept in between the two types of material.

6.2.2 If any material becomes wet during transit, it shall be kept separate from the undamaged material. The wet material may be dried by stacking in shade with battens in between adjacent boards with free access of dry air generally following the guidance laid down in IS : 1141-1958†.

6.2.3 Metal hardware, glass panels, glazing bars and other material shall be stored as recommended by the supplier to avoid any damage to the same by moisture or any other adverse weather conditions.

7. INSTALLATION OF WOODEN DOOR AND WINDOW FRAMES

7.1 Timber door and window frames shall be installed either by 'built-in-method' or 'prepared opening method' as described in **7.2** and **7.3**. Installation into prepared openings shall be preferable, the advantage being that the frame is less liable to distortion and moisture changes.

7.2 Built-in-Method

7.2.1 *Door Frames* — Frames shall be installed at the required place and each door frame shall be provided with three holdfasts on either side-on at the top, one at the bottom (30 cm away from the top and bottom edge) and one in the middle. Masonry or concrete in the wall shall be built after installation of the doors so that holdfasts and pins at the bottom are well anchored into them. Before construction of masonry, the outside of the frames coming in contact with masonry shall be given a thick coat of coal tar or other water proofing paint. Suitable arrangements shall

*Recommendations on stacking and storage of construction materials at site.
†Code of practice for seasoning of timber (*tentative*).

be made to hold the frames in rectangular shape during construction. Usually one cross batten at the middle and one cross batten at the bottom (where no sill is provided for the door) and two cross battens diagonally will be necessary to hod the frame rectangular.

7.2.2 *Window Frames* — Window frames shall also be installed in the same manner as door frames except that at least two holdfasts shall be provided on either side to anchor them in position. The size of the opening shall first be checked and cleaned including the place of the holdfasts of all obstructions. The position of the unit in the reveal shall be taken off the drawings and a vertical chalk line shall be marked on the reveal at the jambs, using a plumb line at the correct distance from the face of the wall. The chalk line shall also be run along the head and sill of the opening.

7.2.3 *Fixing Datum* — To ensure that all units are set at the appropriate heights in their openings, the datum line for the sill of the door, window or ventilator shall be taken from a fixed point on the wall or from finishes floor or ceiling with the help of a level. This datum level shall be given by the builder to the fixer.

7.3 Prepared Opening Method — In this method the fixing in the opening may be flush or rebated as given in the drawings. The clearance between the frame and opening shall be kept depending on whether the opening is externally rendered or fair faced. The frame shall be checked before fixing in the positions that the same is square and in the proper position. The holdfast opening and the bottom pin shall then be grouted. Plastering of the sides shall be done and allowed to dry before the door, window or ventilator shutters are fixed.

7.3.1 *Cleaning the Surroundings* — After the plaster and grouting have dried, all splatter and marks of cement shall be removed and the frames cleaned.

7.4 Other Precautions — Precaution shall be taken to fix the door frame so as to take care of the final floor level and also the following points:

a) Whether the shutters are inside the opening or outside the opening; and

b) Whether the frames are for exterior use or interior use and in the case of latter direction and position of water carriers, slopes, etc.

8. INSTALLATION OF DOOR AND WINDOW SHUTTERS

8.1 Before installation it shall be ascertained that all materials, that is, the shutters, hardwares, etc, are at site and of the correct size and quality. The size of openings and the door frames shall be checked and also the verticality of the side frames and the level position of the floor and the wall. Any adjustment necessary shall be made before installation of the shutters. The shutters shall be installed only after the walls on either side have dried. Good ventilation at the time of installation is necessary.

8.2 The size of the shutters shall be checked before installation. Usually adjustments will be possible by planning the sides, top and bottom to the extent of 6 mm. It is not necessary to cut any door shutter by more than 9 mm unless agreed to by the supplier of the shutters. The door shutters shall be adjusted and fixed with two screws on each hinge (blank fitting) before the polishing of the terrazo and similar type of floorings is taken up. Such shutters shall then be removed the terrazo flooring polished and the shutters refixed in position with all screws.

8.3 During installation the shutters shall be carefully lifted, carried and fixed. Dragging of shutters particularly decorative shutters one over the other or on ground is likely to scratch and damage the surfaces.

8.4 Any special instruction by the door and window manufacturers regarding the position of hinges, aldrops and locks shall be noted and complied with during installation.

8.5 Any transit defects or storage defects in a shutter should be rectified. Any crack should be filled up with a good putty. Any damaged surface veneer particularly in decorative shutter may be rectified by inserting a matching veneer and use of suitable glue and pressing by use of 'C' clamps or other suitable device. Any corner opening may be rectified by the use of glue and pressing by 'C' clamps. Any damage to moulding or glazing bars or other fixtures shall be done at site by use of similar material.

8.6 Unless otherwise specified, door shutters shall be fixed to the frames with 100 mm long hinges and width to suit the thickness of the door and using suitable wood-screws. The hinges shall be fixed one at the centre and the other two at 25 cm each from the top and bottom of the shutter. In the case of window shutters each shutter shall be fixed to its frame with 80 mm hinges at suitable places preferably at quarter height from up and down. When driving the screws it is advisable that in case of hard timbers pilot holes are drilled before fixing the screw. The screw shall be driven tight fit and straight. The ventilator shutters shall be fixed with two hinges per shutter on sides or at top as required and with the same precautions as for fixing window shutters.

8.7 Checking after Fixing—The door and window shutters shall be checked again after fixing for proper location, alignment and swinging. Any rectification necessary shall be done.

8.8 Installation of Fixtures—The shutters shall then be fixed with locks, tower bolts, handles and other fixtures like floor stoppers and aldrops as required. The manufacturer's instructions for fixing these hardware shall be followed. The shutters may also, if required, shall be fixed with name plates, vision panels, louvres, etc.

8.8.1 After all the fixtures have been fitted the shutter shall be tried for proper closure, handling and movement and shall then be prepared for painting or finishing.

8.9 Fixing of Glazed Panels — Glass panels, where desired should be fixed taking precautions that correct type and correct size of glass panels and glass fixtures are used. The opening at the edges shall be filled up with glass fixing putty or beading.

8.10 Installation of Composite Doors, Windows and Ventilators — Where combination of doors, windows and ventilators is desired, care shall be taken that the symmetry of the combination both as to the dimension, colour and fixture is preserved.

8.11 Flush doors for bath room shall preferably be avoided. However, when flush doors are used in such situations, suitable water protection at bottom of the door shall be provided with 15 cm high plate of aluminium or plastic.

8.12 Special fixtures for doors where provided shall be according to the drawing or specifications of the builder.

9. PAINTING, POLISHING, WAXING OR OTHER FINISHING

9.1 The site finishing of timber doors, windows and ventilators shall ensure protection from weather as well as of decoration.

9.2 Site finishing of the frames and shutters shall consist of preparation of the surface by sanding or otherwise smoothening, filling with putty in depression, application of an undercoat and a finishing coat of paint or varnish or wax or lacquer as required. Any touching up necessary shall be done finally.

9.2.1 *Preparation of Surface* — Timber surface shall be well sanded to smoothness and any patch requiring filling shall be so done with wood putty. The surface shall then be prepared by use of a suitable filler or primer paint of white lead or a suitable aluminium primer or varnish filler and allowed to dry and again sanded smooth. The door frame shall also be similarly prepared for final painting or varnishing. [*See* also IS : 2338 (Part I)-1967* and IS : 2338 (Part II)-1967†.]

9.2.2 The two surfaces of a door shutter shall be prepared and given the primer coat and paint or varnish simultaneously.

9.3 Finishing Coat — Two coats of suitable desired paint or varnish shall be given as a finishing coat on either side of the shutters. Such a finish shall be given to the frame and all other exposed wood work. The colour and the type of paint and finish shall be as desired by the user. In case the doors are required to be varnished or polished this will be carried out with the material and to a finish as desired by the user.

*Code of practice for finishing of wood and wood based materials : Part I Operations and workmanship.

†Code of practice for finishing of wood and wood based materials : Part II Schedules.

9.4 Usually all commercial door and window shutters are painted and all decorative panels are either varnished or polished with french polish or wax polish. Further finish shall be done only in consultation and as per the instructions of the supplier of doors, windows, etc.

9.5 The edges of shutters shall be given either a protective paint or protective varnish in the same way as the surfaces. This particularly applies to bottom edge which is likely to come in contact with moisture from floor.

9.6 Precautions shall be taken to protect the glass surface when painting by the use of a suitable protector and the glass surface, cleaned thereafter.

9.6.1 Care shall be taken of fixtures like name plates and hardware during finishing and these shall be finished to the colour and smoothness suitably rectified and well finished.

10. INSPECTION

10.1 After installation, the doors, windows and ventilators, shall be inspected with regard to proper and correct installation, accessories, clearances and smooth working.

11. SEQUENCE OF BUILDING OPERATIONS IN RELATION TO FIXING OF DOORS, WINDOWS, VENTILATOR FRAMES AND SHUTTERS

11.1 Before starting door fixing operations it should be examined whether the frames have been correctly installed and the margin of adjustment of sizes for frame and shutters would be possible. The clearance with regard to openings and frames and also the tolerances in the sizes of door shutters are already covered in the relevant Indian Standards and it will be advantageous to stick to these sizes. The shutter shall open freely when a clearance not exceeding 3 mm is provided and the fittings shall fit easily and smoothly. Painting and finishing work, glazing work, etc, shall be done wherever necessary. When finishing is done at site, the door should be left clean and free from dirt, putty and other adhering material after the work is over.

12. MAINTENANCE

12.1 The timber door, windows and ventilators shall be inspected periodically and repainted or revarnished at least once in two years and any damage noted shall be rectified suitably.

12.2 Any damage by insects should be promptly taken note of and suitable heat or chemical sterilization and other protective methods shall be adopted to rectify them.

BUREAU OF INDIAN STANDARDS

Headquarters:
Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones: 323 0131, 323 8375, 323 9402
Fax : 91 11 3234062, 91 11 3239399

Telegrams : Manaksanstha
(Common to all Offices)

Central Laboratory :

Plot No. 20/9, Site IV, Sahibabad Industrial Area, Sahibabad 201010	8-77 00 32
Regional Offices:	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	323 76 17
*Eastern : 1/14 CIT Scheme VII M, V.I.P. Road, Maniktola, CALCUTTA 700054	337 86 62
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43
Southern : C.I.T. Campus, IV Cross Road, MADRAS 600113	235 23 15
†Western : Manakalaya, E9, Behind Marol Telephone Exchange, Andheri (East), MUMBAI 400093	832 92 95
Branch Offices::	
'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001	550 13 48
‡Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE 560058	839 49 55
Gangotri Complex, 5th Floor, Bhadbhada Road, T.T. Nagar, BHOPAL 462003	55 40 21
Plot No. 21, Satyanagar, BHUBANESHWAR 751007	40 36 27
Kalaikathir Buildings, 670 Avinashi Road, COIMBATORE 641037	21 01 41
Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001	8-28 88 01
Savitri Complex, 116 G.T. Road, GHAZIABAD 201001	8-71 19 96
53/5 Ward No.29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003	54 11 37
5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001	20 10 83
E-52, Chitaranjan Marg, C-Scheme, JAIPUR 302001	37 29 25
117/418 B, Sarvodaya Nagar, KANPUR 208005	21 68 76
Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001	23 89 23
Patliputra Industrial Estate, PATNA 800013	26 23 05
T.C. No. 14/1421, University P. O. Palayam, THIRUVANANTHAPURAM 695034	6 21 17
Inspection Offices (With Sale Point) :	
Pushpanjali, 1st Floor, 205-A, West High Court Road, Shankar Nagar Square, NAGPUR 440010	52 51 71
Institution of Engineers (India) Building 1332 Shivaji Nagar, PUNE 411005	32 36 35

*Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072 — 27 10 85

†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007 — 309 65 28

‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002 — 222 39 71

Reprography Unit, BIS, New Delhi, India