CED11(26385)P
August 2024

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

प्रारंभिक मसौदा

16 अगस्त 2024

हमारा संदर्भः सीईडी 11/टी-48

तकनीकी समिति: दरवाजे, खिड़कियाँ और शटर विषय समिति, सीईडी 11

सीईडी 11 के सभी सदस्य

महोदय/महोदया,

निम्नलिखित मानक का मसौदा संलग्न हैं:

प्रलेख संख्या	शीर्षक
सीईडी 11(26385)पी	**यूपीवीसी प्रोफाइल फ्रेमयुक्त दरवाजे, खिड़कियां और स्लाइडर – विशिष्टता के लिए प्रारंभिक मसौदा** ICS: 83.140; 91.060.50

सम्मतियाँ भेजने की अंतिम तिथि**: 15 सितम्बर 2024**.

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फोर्मेट में भेजें या ced11@bis.gov.in पर ईमेल कर दें ।

धन्यवाद ।

भवदीय,

(**प्रदीप सिंह शेखावत**)
सदस्य सचिव सीईडी 11
वैज्ञानिक 'डी' (सिविल इंजीनियरी)
ई-मेलः ced11@bis.gov.in
दूरभाष : 011-23608490

संलग्न : उपरिलखित

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

PRELIMINARY DRAFT

16 August 2024

Our Ref: CED 11/T-48

TECHNICAL COMMITTEE: Doors, Windows and Shutter
Sectional Committee, CED 11

ALL THE MEMBERS OF CED 11

Dear Sir/Madam,

Please find enclosed the following document:

Doc No.	Title
CED 11(26385)P	**Preliminary Draft for uPVC Profiles Framed Doors, Windows and sliders – Specification** ICS : 83.140; 91.060.50

Last date for comments: **15 September 2024.**

Comments, if any, may please be made in the format as enclosed herewith and e-mailed to the undersigned at **ced11@bis.gov.in**.

Thanking you,

Yours faithfully,

(Pradeep Singh Shekhawat)
Member Secretary CED 11
Scientist 'D' (Civil Engineering)
E-mail: ced11@bis.gov.in
Telephone: 011-23608490

Encl: As above

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A-4 size sheet of paper only and type within fields indicated. Comments on each clause/sub-clause/table/fig etc. be started on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work) {Please e-mail your comments to **ced11@bis.gov.in**

***DOC. NO. & TITLE*: CED 11 (26385)P**

Preliminary Draft uPVC Profiles Framed Doors, Windows and sliders – Specification

ICS : 83.140; 91.060.50

LAST DATE OF COMMENTS: 15/09/2024.

NAME OF THE COMMENTATOR/ORGANIZATION: _____

Sl. No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change

BUREAU OF INDIAN STANDARDS

Preliminary Draft Indian Standard

uPVC PROFILES FRAMED DOORS, WINDOWS AND SLIDERS – SPECIFICATION

FOREWORD

(*Formal Clauses will be added later*)

Due to availability of different materials along-with the advancement in the technology in the manufacturing of framed doors, windows and sliders, nowadays lot of options are available in the market. One of the option is uPVC framed doors, widows and sliders. The advantage with framed doors, windows and sliders, are good aesthetic, acoustics, more view area, etc. However, over and above the looks and aesthetics, it is also very much important that these framed doors, windows and sliders must meet the desired performance for the purpose they have been installed in buildings. The performance parameters include air infiltration / exfiltration, water tightness, operating force, durability, mass, corrosion, thermal, acoustic, impact resistance, mechanical strength, etc.

For the awareness in terms of the performance and to meet the desired quality for the same in framed doors, windows and sliders, standardization is required. Considering the same two standards have been formulated. One is the product specification for uPVC framed doors, windows and sliders specifying the raw material requirements as well as final performance requirements. The other draft specification (under preparation, [CED 11(21288) WC] will be published separately) is for classification based on product type, different performances, etc of the framed doors, windows and sliders and performance tests based on the classifications.

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 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

BUREAU OF INDIAN STANDARDS

Preliminary Draft Indian Standard

uPVC PROFILES FRAMED DOORS, WINDOWS AND SLIDERS – SPECIFICATION

1 SCOPE

This standard specifies the requirements for materials, performance requirement of whole units and tests of doors, windows and sliders made from uPVC including constituent materials and glazing.

This standard does not apply to:

a) Windows and doors subject to regulations on smoke leakage and resistance to fire
b) Curtain walls,
c) Industrial, commercial and garage doors,
d) Revolving doors,
e) Internal partitions including internal windows, doors and sliders, and
f) Bullet and blast resistant windows, doors and sliders.

2 REFERENCES

The Indian Standards given in Annex A contain provisions which though reference in the text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to investigate the possibility of applying the most recent editions of the standards indicated.

3 TERMINOLOGY

For the purpose of this standard, the definitions given, in the standard 'Classification and Performance Requirement for Doors, Windows and Slider' [Doc – CED11 (21288*)* under development] shall apply.

4 TYPES, HANDING AND CLASSIFICATION

The types, handing and classification of uPVC framed doors, windows and sliders shall be as given in in the standard 'Classification and Performance Requirement for Doors, Windows and Slider' [Doc – CED11 (21288*)* under development].

5 MATERIALS AND CONSTRUCTION

5.1 Upvc Profiles

The UPVC profiles used for fabrication of doors and windows shall conform to the requirements of IS 17953.

5.2. Aluminium Extrusions and Flashing

Extruded aluminium alloy used for structural members and additional profiles such as Interlocks, Rails, couplers etc., shall be fabricated from the most appropriate grade of alloy complying with IS 733, IS 8147 or equivalent or better (in terms of mechanical properties) and being made with complete homogenized billets to ensure uniform property all across the profile. The chemical composition and mechanical properties of the aluminium profile used in the manufacture of the aluminium door, window and slider shall be traceable and produced when requested. The thickness of the aluminium sections can vary but it shall meet the design, structural, performance, safety and durability requirements.

Such extrusions shall preferably be extruded aluminium grade 6063-T5, 6063-T6, 6060- T66 as per IS 8147 or equivalent. All aluminium alloys used as extruded rods/bars, tubes and profiles shall be compliant with IS 733/IS 738. Flashing, if in aluminium, around the doors and windows to be made of aluminium sheet alloy as per IS 737 or equivalent.

Visible profile distortions post surface finishing when viewed from a distance of 3 m shall be accepted. Any distortion beyond this distance, acceptance to be mutually agreed with stakeholder.

The aluminium system may be finished by one of the following:

a) Anodizing as per IS 1868
b) Liquid organic coating
c) Powder coating as per IS 13871

Protective tape with an adhesive that does not leave stains upon removal and lasts a minimum of 3 months shall be applied. The thickness of the protective tape shall be minimum 40 microns.

5.3 Glass

Different type of glass and glazing products used in doors, windows and sliders shall be as per the following Indian Standards:

a) Float glass (Annealed glass) conforming to IS 14900,
b) Safety glass (Laminated and Toughened Glass) conforming to IS 2553 (Part 1),
c) Heat strengthened glass conforming to IS 16982,
d) Insulated glazing unit (IGU) conforming to IS 17346,
e) Silvered glass mirror conforming to IS 3438.

NOTE – For guidance related to selection of glass, refer IS 16231 (Parts 1 to 4) and IS 16978(Parts 1 to 4).

5.4. Hardware and Fixing

All metal straps, clips, brackets, screws, nuts, bolts, washers and other fixings and all metal components of hardware shall be manufactured from one of the following:

a) Anodized/Powder coated aluminium alloy,
b) Zinc die casting,
c) Leaded brass,
d) Cast leaded gunmetal,
e) Austenitic steel, and
f) Any metal which has been treated for corrosion protection such that there shall be no corrosion of the metal visible to normal or corrected vision when subjected to 240h (grade 4) exposure in a neutral salt spray test as per IS 9844.

For coastal areas, where the hardware is used at a distance of less than 1 km from the seashore, 480 h (grade 5) exposure is to be used. Where windows are located in all other regions and exposed to the external atmosphere/environment, 240 h (grade 4) corrosion class shall be used.

NOTE – For grades see Doc – CED11 (21288) (under development)

All windows, doors and slider component fastening to be of minimum austenitic steel grade304 as per IS 6911.

Some of the hardware components may contain parts made of plastics – nylon, PE and PP. These shall be designed to provide easy movement and to adequately support the panel during extended usage.

5.5. Locking Points

For sliding windows with height greater than 1.5m and casement windows with height greater than 0.9m, multipoint locking shall be used.

For Doors (Casement and sliders) multipoint lock shall be mandatory. Maximum distance of the locking point from the edge of the Sash shall not be more than 300mm.

5.6. Human Life Safety Especially for Children

5.6.1 *Window Restrictor for Children*

For projected top hung window, parallel opening window, vertical sliding hung window and pivot window (except when used as an access door), the window restrictor shall be located such that the clear opening shall not exceed 125 mm (for human life safety especially for children). When a force of 250 N is applied in opening condition to any part of the sash a sphere of 125 mm shall not pass through any part of the opening. Key releasable window restrictor can be used for the purpose of cleaning/maintenance. The side hung opening shall be restricted to be used low rise buildings [20 m see IS 875 (Part 3)]. For buildings above 20 m height, projected top hung or parallel opening with an opening restriction of 125 mm shall be used.

NOTES

1) For fire access panels/window, the local regulations apply and shall supersede the above.

2) This is mandatory for residential apartments and optional for commercial establishment. However, it is recommended to limit the opening to 125 mm for commercial establishments as well especially for high rise buildings.

5.6.2. *Anti-Fallout*

Shall be applicable as per the following:

5.6.2.1. For all open out windows in buildings up to 20 storey height (< 70 m) anti-fallout secondary safety device is optional.

5.6.2.2. For all open out windows in buildings more than 20 storey height (> 70 m) anti-fallout secondary safety device is mandatory.

5.6.2.3. In the case of a fall out due to the sash getting completely disengaged from the hinges/stay arms/restrictors, the anti-fallout device shall be capable of withstanding the self-weight of the sash. The drop height for the test shall be between 100 mm to 250 mm.

5.7 Reinforcement

The reinforcement may be of mild steel with corrosion resistance coating, stainless steel or extruded aluminium. The reinforcement shall be installed so that it shall not move or rattle when the window is in use. The reinforcement shall be provided in a closed or sealed chamber.

The thickness of the reinforcement shall be such that the windows meet the performance requirements as per IS 18694: 2024 as per wind load calculated in accordance with IS 875 (Part 3). Design of the reinforcement should be as per system supplier and shall meet structural requirements of allowable deflection and stress.

In case of mild steel is used as reinforcement, it shall conform to any grade of IS 1079 or IS 513 and shall be galvanized with a zinc of minimum grade of coating of 120 g/m^2 of IS 277 for internal usage. For external usage of reinforcement (ex-couplers), it shall be hot dip galvanized with coating thickness of 100 -120 microns, alternatively cold galvanizing with zinc of minimum grade of coating of 275 g/m^2 of IS 277. The minimum wall thickness of mild steel reinforcement shall be 1.5 mm. The deviation from straightness shall not be more than 1mm for a length of 600 mm.

Reinforcement shall have minimum space of 0.5 mm all around the perimeter between the reinforcement and the uPVC profile cavity.

5.8 Safety in Construction of Windows, Doors and Sliders

a) For all open out windows in buildings up-to 20 storey height (< 70 m) anti-fallout secondary safety device is optional.

b) For all open out windows in buildings more than 20 storey height (> 70 m) anti-fallout secondary safety device is mandatory.

c) For all sliders to be installed greater than 20 storied building it is recommended to
have symmetrical interlock.

d) For wind loads beyond 3 000 Pa, only inward operable windows & doors and sliders shall be used.

NOTE – During high winds, storms, cyclones, all operable units have to be kept in closed condition and fastened.

5.9 Sealants

TBD

5.10 Glazing Gasket

Material for glazing gaskets and weather stripping shall be of EPDM rubber or equivalent like silicone, rubber, vulcanized or thermoplastic material having the properties in Table 2.

TABLE 2 PROPERTIES OF GLAZING GASKETS

(*Clause* 5.10)

Sl. No.	Characteristic	Requirement	Method of Test, Ref
(1)	(2)	(3)	(4)
i)	IRHD/Shore hardness A	60 to 80 Shore A	IS 3400 (Part 2) / IS 3400 (Part 23)
ii)	Compression set percent (*see* Note) High at (100 ± 1)°C for (24 +0/-2 h) Low at (-25 ± 2)°C for (24 +0/-2 h)	≤ 35 percent ≤ 85 percent	IS 3400 (Part 10)
iii)	Ozone resistance (50 pphm for 96 +0/-2 h at 40 ± 2°C)	No visible cracks	IS 3400(Part 20)
iv)	Ageing test (for 168 + 0/-2 h at 100 ± 1°C) Co-efficient of deterioration of Hardness change, *Max* (Shore A) Tensile strength change, *Max* Elongation at break change, *Max*	+ 15/- 5 - 25 percent of initial value - 50 percent of initial value	IS 3400 (Part 4)
v)	Minimum tensile strength	7.5 MPa	IS 3400 (Part 1)
vii)	Visual assessment under naked eye - distance 40 cm; profile buckled at 30° or Inspection under 10x magnification	No evident cracks or blisters. - Changes must not result in specking, blistering, striation or cracking, or any other notable adverse effects on appearance.	Visual
NOTES			

1) Compression set percent = (Initial specimen thickness – Thickness after test)/Initial thickness in mm.

2) It is recommended that, for EPDM gaskets, EPDM content in the compound should be minimum 20 percent and carbon content shall be minimum 30 percent and measured with suitable testing methodology as per agreement between the manufacturer and the purchaser.

5.10.1 *EPDM Extrusion Curing*

a) Peroxide cured – salt bath line
b) Sulphur cured – microwave line

5.10.2 *Dimensional Tolerances*

The tolerances to be applied shall be chosen, by agreement between the concerned parties from the classes of tolerance described below, for which the standard tolerances are given in Table 3.

a) E1 – High quality
b) E2 – Good quality
c) E3 – Non-critical

In any extruded cross-section, the dimensions of only two of the three variables (that is inside dimensions, outside dimensions and wall thickness) can have a tolerance to control the dimensions of the cross-section.

TABLE 3 TOLERANCES ON CROSS-SECTIONAL DIMENSIONS OF UNSUPPORTED EXTRUSIONS

(*Clause* 5.10.2)

Nominal dimension mm		**Class E1 ± mm**	**Class E2 ± mm**	**Class E3 ± mm**
Above Upto and mm	Upto and including			
(1)	(2)	(3)	(4)	(5)
0	1.5	0.15	0.25	0.40
1.5	2.5	0.20	0.35	0.50
2.5	4.0	0.25	0.40	0.70
4.0	6.3	0.35	0.50	0.80
6.3	10.0	0.40	0.70	1.00
10	16	0.50	0.80	1.30
16	25	0.70	1.00	1.60
25	40	0.80	1.30	2.0
40	63	1.00	1.60	2.50
63	100	1.30	2.00	3.20

5.11 *Setting Blocks*

The number and location of setting blocks shall be as shown in Fig 1. Setting blocks shall be:

a) positioned at quarter points or not less than 30 mm from the corner;

b) minimum width of each setting block shall be 2 mm more than the glass thickness;
and

c) if a glazing bridge is used, then the thickness of the glazing bridge can be added to the thickness of the setting block to achieve the minimum gap of 6 mm between the edge of glass and the framing member.

Setting blocks shall be located to equally support all panes of glass, and shall be fixed to prevent displacement during installation and service. The minimum length of each setting block (or two blocks side by side) shall be 25 mm in length for every square metre of glass area, with a minimum length of 50 mm. Setting block material shall be PVC, silicone compatible EPDM or silicone with a Shore A hardness of 80 to 90. Setting blocks shall be of resilient, load-bearing and material that is compatible with all other glazing materials conforming to available standards (if any) that may come into contact with the blocks.

For example, for a 3.0 m2 glass area, 3.0 × 25 mm = 75 mm long, that is, 75 mm is the length of each setting block.

NOTES

1) Setting block width and location should not restrict water drainage.
2) Shaped setting block or glazing bridge is commonly used to achieve a flat surface for the glazing.

5.12 *Location of Glazing Blocks*

The number and position of location blocks shall be as shown in Fig.1

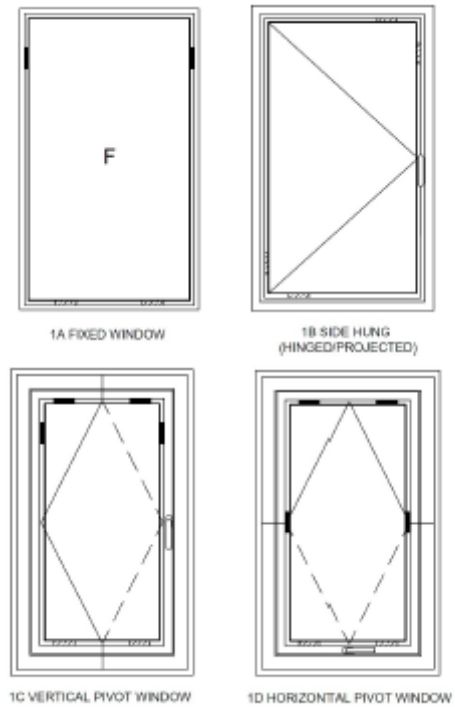
Location blocks shall be;

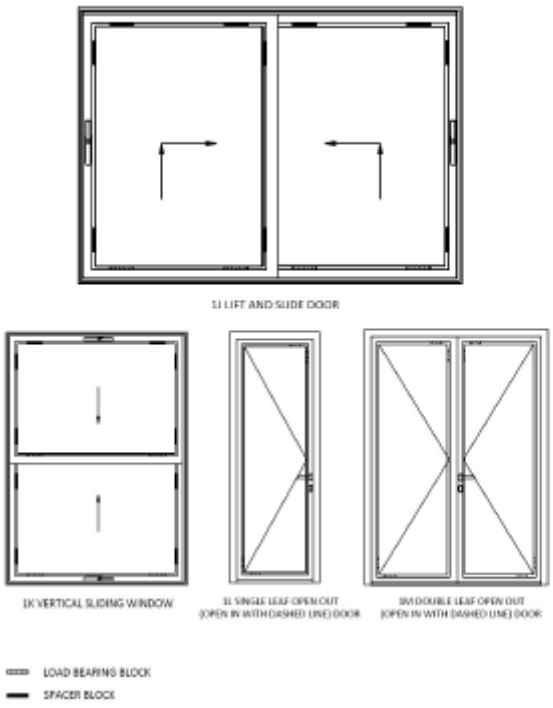
a) of Minutes of 25 mm in length;
b) At least as wide as the glass thickness;
c) Positively located to prevent displacement in service; and
d) Sufficiently resilient to accommodate movement within the frame, without imposing stress on the glass, and of resilient material.

NOTES

1) Location blocks are used between the edges of the glass and the frame to prevent movement of the glass within the frame by thermal expansion or when the window or door is opened or closed. They are required to prevent the weight of the glass from causing he frame to become out of square.

2) Material similar to setting block can be used.


F
1A FIXED WINDOW
1B SIDE HUNG
(HINGED/PROJECTED)
1C VERTICAL PIVOT WINDOW
1D HORIZONTAL PIVOT WINDOW


1J LIFT AND SLIDE DOOR
1K VERTICAL SLIDING WINDOW
1L SINGLE LEAF OPEN OUT
(OPEN IN WITH DASHED LINE) DOOR
1M DOUBLE LEAF OPEN OUT
(OPEN IN WITH DASHED LINE) DOOR
LOAD BEARING BLOCK
SPACER BLOCK

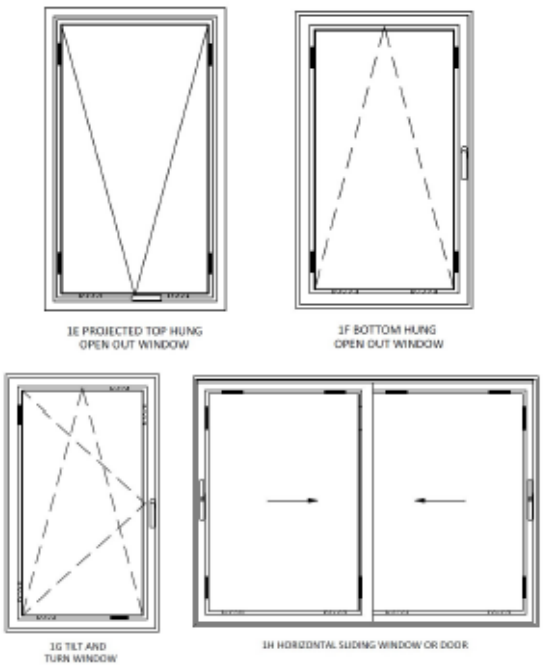


FIG. 1 NUMBER AND POSITION OF SETTING AND LOCATION/GLAZING BLOCK.

5.13 *Drainage and Ventilation*

Ventilation and drainage holes and slots shall be provided in the frames, sash, transom or mullions in order to permit the escape of entrapped water, moisture or hot air from the system.

A minimum of 2 nos. of 5 mm x 20 mm slots shall be provided at every 600 mm. The holes and slots shall offset between the inner and outer walls by minimum 25 mm so as to prevent any back flow. (refer Fig 2).

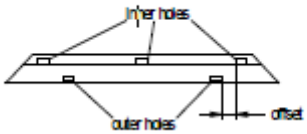


FIG. 2 VENTILATION AND DRAINAGE HOLE LOCATION.

5.14 *Joinery*

UPVC windows shall be fabricated with fusion welded corners. The mullions or transoms shall be either fusion welded or mechanically joined with adequate sealing so as to prevent any ingress of water or air in the reinforcement chamber or inside the room / building.

5.14.1 *Weldability*
For the determination of the weldability of profiles, welded corners shall be tested as per IS 17953 - in Annex F.

The calculated mean stress at maximum load of each corner, σt or σc, shall not be less than 90% of the values as specified in IS 17953 clause 5.8.profineprofine.

5.14.2 *Mechanical Jointing*

When mechanical jointed Mullions are tested for torsion, water shall not penetrate through the joint into the reinforcing chambers, undrained chambers (checked by dismantling the specimen and inside of the building. Two U shaped sections, to suit the profile depth and width (60 ± 10mm) is used (refer Fig 3). Using these levers apply a load simultaneously at both ends of the mullion profile. Apply 20 loading cycles, with alternating torque of ±10 Nm with each torque maintained for 1 minute. Apply a static loading torque of 10 Nm simultaneously at each end of the mullion in each direction in turn. Measure and record the maximum misalignment at the extreme ends of the Mullion. This misalignment shall not be more than 2mm from the neutral position (average of two positions).

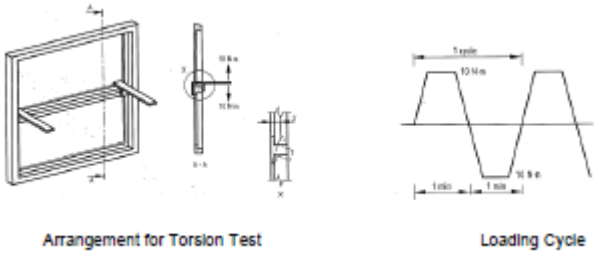


FIG. 3 MULLION MECHANICAL JOINT.

6 DIMENSIONS AND TOLERANCES

The width and height of the door, window and slider shall be the measured between the outer faces of outer frame to outer frame as shown in Fig. 4. The dimensions shown inFig.4 are only indicative for the purpose of example.

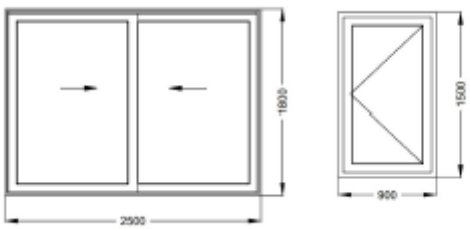


FIG. 3 SYMBOLIC REPRESENTATION OF MEASURING DIMENSIONS.

For fabrication and assembly of doors, windows and sliders, the tolerances shall be as follows:

	For linear dimensions ≤ 1500 mm	For linear dimensions > 1500 mm
Linear Dimensions	± 2 mm	± 3 mm
Diagonal Difference	+ 5 mm	+ 10 mm

NOTE – For installation tolerances see CED11 (21288).

7 TESTS AND REQUIREMENTS

The following tests shall be carried out on the uPVC framed doors, windows and sliders. For the requirements and tests methods, as per IS 18648 :2024 shall be referred:

a) Air infiltration/exfiltration
b) Water tightness
c) Operating force
d) Durability
e) Mass
f) Corrosion
g) Thermal
h) Acoustic
i) Impact resistance
j) Mechanical strength

1 Racking and static torsion
2 Diagonal deformation

8 LOT, SAMPLING AND CRITERIA OF CONFORMITY

8.1 Lot Definition

Windows, doors and sliders with same designation and designed for same load application, manufactured with raw materials having similar properties shall constitute a lot.

8.2 Sampling

Random sampling to be taken from every lot. However, the number of samples shall be agreed upon mutual understanding between the parties.

8.3 Criteria of Conformity

Sample selected as mentioned above shall meet the requirements mentioned in the standard.

9 PACKAGING

a) All doors, windows and sliders shall be dispatched with the opening parts suitable secured to preserve alignment when fixing and glazing.
b) All hardware shall be despatched separately.
c) Coupled windows, doors and sliders shall be dispatched uncoupled.

10 MARKING

10.1 Each window shall be legibly marked in a position which is not visible when the Opening light is closed, with the following.

a) Name of manufacturer or his authorized Trade Mark or Brand Name.
b) The value for each parameter mentioned in the Classification.
c) Date of manufacture or batch number.
d) Identification no. of the unit.

10.2 BIS Certification Marks

The product(s) may be marked with Standard Mark as per the conformity assessment Schemes governed by the provisions of the Bureau of Indian Standards Act, 2016 and the Rules and Regulations made there under. The details of conditions for the Licence may be obtained from the Bureau of Indian Standards.

ANNEX A
(*Clause* 2)

LIST OF REFFERED INDIAN STANDARDS

IS. No	Title
IS 277 : 2018	Galvanized steel strips and sheets (Plain and corrugated) – Specification (*second revision*)
IS 513 (Part 1) : 2016	Cold reduced carbon steel sheet and strip: Part 1 Cold forming and drawing purpose (*sixth revision*)
IS 733 : 1983	Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes) (*third revision*)
IS 737: 2008	Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes – Specification (*fourth revision*)
IS 738 : 1994	Wrought aluminium alloys, drawn tube for general engineering purposes – Specification (*third revision*)
IS 875 (Part 3) : 2015	Design loads (other than earthquake) for buildings and structures – Code of practice: Part 3 Wind loads (*third revision*)
IS 1079 : 2017	Hot rolled carbon steel sheet, plate and strip – Specification *(seventh revision*)
IS 1868 : 1996	Anodic coatings on aluminium and its alloys – Specification (third revision)
IS 2553 (Part 1) :2018	Safety glass – Specification: Part 1 Architectural, building and general uses (*fourth revision*)
IS 3400	Methods of test for vulcanized rubber
(Part 1) : 2021 (Part 2) : 2014 (Part 4) : 2012 (Part 10) : 1977 (Part 20) : 2018 (Part 23) : 2002	Tensile stress-strain properties (*fourth revision*) Rubber, vulcanized or thermoplastic – Determination of hardness (Hardness between 10 IRHD and 100 IRHD) (fourth revision) Accelerated ageing and heat resistance (third revision) Compression set at constant strain (first revision) Resistance to ozone cracking – Static strain test (second revision) Rubber – Determination of indentation hardness by means of pocket hardness meters
IS 3438 : 1994	Silvered glass mirrors for general purposes – Specification (*second revision*)
IS 6911 : 2017	Stainless steel plate, sheet and strip – Specification (*second revision*)
IS 8147 : 1976	Code of practice for use of aluminium alloys in structures
IS 9844 : 1981	Methods of testing corrosion resistance of electroplated and anodized aluminium coatings by neutral salt spray test
IS 13871 : 2021	Powder coatings – Specification (*first revision*)

IS 18648 : 2024	Classification and Performance Requirements for Doors Windows and Sliders - Specification