

**SUPPLY AND INSTALLATION OF UPVC WINDOWS**  
**FOR**  
**PROPOSED PERMANENT CAMPUS (PHASE I) FOR INDIAN INSTITUTE OF**  
**MANAGEMENT UDAIPUR, AT VILLAGE BALICHA, UDAIPUR**  
**TECHNICAL SPECIFICATIONS –**  
**SUPPLY AND INSTALLATION OF UPVC WINDOWS**

**UPVC WINDOWS**

**COMPOSITION**

Un-plasticized PVC (Polyvinyl Chloride) meeting the requirement of ASTM D 1748 / BS 7413/ EN 12608 shall be used. No reworked material is to be used in any profile; whether used internally or externally.

**PROFILE MARKING**

The main frame profile shall be permanently marked at approximately 1 meter intervals with an identifying mark which enables the name of the profile Systems supplier, date of manufacture and extruder to be identified without extraction of the window.

**DURABILITY**

The Systems shall be resistant to chemicals, and be fungal and vermin proof. The profiles must be colorfast, being able to withstand weather and light resistance test of 4000 hours on xenon and weathering apparatus.

**COLOUR**

The Systems color should be uniform and consistent.

**FIRE RESISTANCE**

The uPVC should be classed as self extinguishing to prevent support or enhancement of accidental fires.

**QUALITY CONTROL**

The extrusion process must be quality controlled and the appropriate standards relating to impact strength, technical performance and consistency.

**PROFILE CONSTRUCTION**

The profile depth should be minimum of 58mm with a nominal wall thickness, internally and externally of 2.8mm. The profile shall have a minimum of two sealed chambers for transoms and mullions and 3 sealed chambers for frames and sashes.

## **INTERNAL PROFILE DRAINAGE**

The internal drainage shall be isolated from chambers into which reinforcements can be placed or through which frame fixing pass. Drainage shall be either through the base or alternatively to the face, concealed by face drainage caps.

## **PRESSURE EQUALIZATION**

Pressure equalization for glazing rebates and for frame rebates shall be carried out in accordance with the recommendation of the profile Systems supplier to ensure efficient drainage in adverse conditions.

## **WINDOW PERFORMANCE**

Windows must meet the requirements with respect to air permeability, water tightness and wind resistance upto 2400 pa.

## **STRENGTH AND SAFETY OF MOVING PARTS**

The moving parts of the Windows must have sufficient strength and robustness to withstand accidental Static and Dynamic loads in use, without any permanent deflection or breakage. The overall evaluation will be based on the experience from use and subject to approval by the Design Consultant/ Client.

## **GLAZING BEADS**

Glazing beads shall be of the one foot snap in design and shall be extruded U PVC mitred at the corners. All glazing beads shall be with a co-extruded gasket of a multi-fin design to maintain security and weather performance. Gasket material shall be thermo Plastic Elastomer.

## **GLAZING GASKETS**

All glazing gaskets as well as weather seals are to be extruded from non migratory EPDM . Glazing gaskets shall be a continuous length. Gasket may be subjected to random testing and shall be obtained from the profile Systems supplier.

## **WEATHER SEALS**

Weather seals shall consist of a double sealing Systems. Seals on the sash and the frame shall be continuous length and for outward opening windows the seal on the sash shall be joined to a 50mm length of pressure relief seal at the bottom of the opening whereas the seal on the frame shall be joined on the top of opening.

Weather seals and pressure relief seals, which shall be obtained from the profile Systems supplier, shall be capable of removal without disturbing the glazing Systems or removal of the frame or sash.

## **GLAZING**

All glazing shall be internally beaded. The windows shall be constructed in such a manner that the glazing or deglazing can take place without the removal of the sash or frame.

## **WELDED JOINTS**

All corner joints shall be homogeneously fusion heat welded in accordance with the instructions of the profile Systems supplier. The resulting joints shall be finished by the grooving/knifing method. Solvent welded joints shall not be allowed.

## **REINFORCEMENT**

All transoms and mullions shall be fully reinforced, irrespective of size, with corrosion resistant galvanized steel. All other profiles to be reinforced as per the specification of the profile Systems supplier which shall suit the proposed style application relative to exposure, elevation and height above the ground level. Reinforcing shall be secured by suitable screws in accordance with the instructions of the profile Systems supplier.

All galvanized steel reinforcing profiles shall comply with BS 2989 1982 Grade G 275N / IS 4759-1996 or equivalent.

## **MECHANICAL JOINTS**

The mechanical jointing of mullions and transoms shall be carried out in strict accordance with the instructions/recommendations of the profile Systems supplier using only approved mechanical coupling components.

## **HARDWARE GENERAL**

All hardware shall be manufactured from corrosion resistant material and be approved by the profile Systems supplier.

All ferrous screws, nuts, bolts and other fastening or fixing shall be of stainless grade or of a suitable coated steel recommended for use in the fabrication of UPVC windows.

Metal that are in contact with each other shall be compatible so as to prevent galvanic corrosion of dissimilar metals by electrolytic action. All hardware should ideally be fixed by attachments through the UPVC to the reinforcement; alternatively it should be fixed in purpose designed screw ports or at least two thickness of UPVC.

Hardware with provision for adjustment shall be accessible for adjusting after the window has been installed. Hardware used to open and close the window shall be replaceable without removing the outer frame from the structure.

## **FRICTION HINGES**

Top hung and side hung opening out lights shall have two friction stays per light and be of stainless steel construction.

The size of the friction stay will depend on size, weight, hanging and exposure of the relevant sashes. This will be determined from table provided by the hinge manufacturer. All side hung friction stays are to be incorporate a riser block to allow the sash to be supported in its closed position.

## **BUTT HINGES**

Where external butt hinges are used they must be of the security pin type which do not allow removal of the hinge pin from outside.

## **ESPAÑOLETTE HANDLES**

All espagnolette striking plates are to be purpose designed and secured to the outer frame by approved screw fixing. The espagnolette mechanism shall be of multi locking points dependants on size.

All ironmongery where possible shall be screwed into frame reinforcing, or fixing screws must penetrate a minimum of two wall thickness or an equivalent screw port, to obtain sufficient purchase.

## **FIXING THE FRAME TO THE BUILDING**

The gap between the structural opening and the uPVC frame shall be between 5 to 10mm all round, which should be filled by injectable PU foam after completion of fixing for best frame and wall bonding, and for sound and thermal insulation and finally applying neutral cure low modulus Silicone sealant to make joint water proof.

Fixing points shall be to all four sides of a frame, spaced 150mm to 250mm from corners and not more than 600mm apart elsewhere. Fixing shall be by direct drilling 10mm hole through U PVC frame to building wall. Each fixing shall penetrate into building structure by no less than 40mm. and ultimate fixing with anti corrosive plated anchor bolts through these holes.



All heads of all fixing screws shall be covered with appropriate plastic cover caps.

## HANDING AND TRANSPORT

Windows may be transported either glazed or unglazed. All windows or prefabricated units shall be transported and stacked in a vertical position and properly anchored to prevent movement in transit, windows shall be separated from each other by adequate packing piece during transport.

## WARRANTEE

The window manufacturer shall issue to the client a certificate of warrantee against any manufacturing or installation defect, valid for minimum of five year for rectification of the defect.

## TECHNICAL SPECIFICATIONS

S.NO.	TECHNICAL SPECIFICATION	VALUE
1.	Impact strength down to 400C	No breakage
2.	Notch impact strength	$> 30 \text{ kJ/m}^2$
3.	Ball impact hardness	$100 \text{ N/mm}^2$
4.	Tensile strength	$> 40 \text{ N/mm}^2$
5.	E module	$> 2500 \text{ N/mm}^2$
6.	Linear Thermal Expansion	Coefficient $30^0\text{C}$ to $+50^0\text{C}$ $0.80 \times 10^{-4} \text{ K}^{-1}$
7.	Thermal Conductivity	$0.16 \text{ W/mK}$
8.	Specific volume resistance	$10^{16} \Omega \text{ cm}$
9.	Relative Permittivity	3.3 at 50GHz 2.9 at $10^6 \text{ Hz}$
10.	Fire behaviour	Self extinguishing
11.	Weathering stability RAL GZ 716/1	After $8.0 \text{ GJ/m}^2$ irradiation energy better than authenticity grade 4 of grey scale

12.	Special Resistance	Resistance to termites, decay, chemicals e.g. alkalines, acids, salts, salty solutions, seawater, petrol, oil, lime, cement, any kind of emissions Physiological Behaviour and environmental characteristics Inert, Neutral, The weathering stability and the resistance against chemical and decay ensure that there exist no health and environmental risks during handling.
13.	Physiological Behaviors and environmental characteristics	Inert, Neutral, The weathering stability and the resistance against chemical and decay ensure that there exist no health and environmental risk during handling
14.	Wind resistance	Up to wind pressure of 2400PA
15.	Acoustic	Class 5
16.	Water Tightness	Watertight upto 600PA