



uPVC Door & Window System

User should check the validity of the Certificate by contacting Member Secretary, BMBA at BMTPC or the Holder of the Certificate

Name and Address of Certificate Holder: **M/s Lotus Fenstek**,
Block-B, Ground Floor,
Kila No 29/22/2, NH-01 Highway,
Bahalgarh, Tehsil Rai, District
Sonipat, Haryana 131021.
E-Mail: lotusfenstek@gmail.com
Website: www.lotuswindoors.co.in

Performance
Appraisal Certificate
PAC No. **1069-C/2023**
Issue No. **01**
Date of Issue:
18.07.2023



bmtpc

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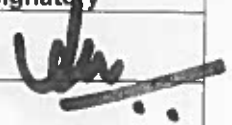
**Performance Appraisal Certificate
For**

uPVC Door & Window System

Issued to

M/s Lotus Fenstek

STATUS OF PAC

S. No.	Issue No.	Date of Issue	Date of Renewal	Amendment		Valid upto (Date)	Remarks	Signature of Authorized Signatory
				No.	Date			
1	01	18.07.2023				17.07.2024		

PAC No. 1069-C/2023

Issue No. 01

Date of issue: 18.07.2023

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PART 1: CERTIFICATION

1.1 Certificate Holder: **Lotus Fenstek**
 Block-B, Ground Floor,
 Kila No 29/22/2, NH-01 Highway,
 Bahalgarh, Tehsil Rai, District Sonipat,
 Haryana 131021.
 E-Mail: lotusfenstek@gmail.com
 Web Site: www.lotuswindoors.co.in

1.2 Description of the Product

1.2.1 Name of the Product: uPVC Door & Window System

1.2.2 Brand Name: LOTUS WIIINDOORS

1.2.3 Brief Description

uPVC Doors & Windows are fabricated by the Agency from the unplasticized Poly vinylchloride (uPVC) extruded hollow multi chamber profile sections. The uPVC comprises of Poly vinylchloride, Calcium carbonate, Titanium dioxide, stabiliser (Ca-Zn) and Impact modifier. The agency is authorized partner of Deceuninck, one of the world's largest manufacturers of uPVC profile sections, having origin in Belgium & a branch office in Chennai, India, and presently sourcing uPVC extruded profiles from the Deceuninck production facility at Turkey. These sections of uPVC extruded profiles are available in small and big series, and meets various sizes of door & window systems as per customer requirements.

1.2.4 Types of Products

1.2.4.1 Types of uPVC Doors & Windows

The types of Door & Window systems are fabricated in Big & Small series, as per the details below;

S. No.	Product Code as per DSR 2016	Description/Types of Window and Door Systems as per DSR 2016	LOTUS WIIINDOORS*		
			Frame	Sash / Shutter Opening	
			(in mm)	Outward	Inward
1	8121	Upvc extruded (small series) Casement Window Frame	60 X 62 mm		

S. No.	Product Code as per DSR 2016	Description/Types of Window and Door Systems as per DSR 2016	LOTUS WIIINDOORS*		
			Frame	Sash / Shutter Opening	
			(in mm)	Outward	Inward
2	8122	Upvc extruded (small series) Casement Window Sash		60 X 79 mm	60 X 59 mm
3	8122	Upvc extruded (small series) Casement Window mullion		60 X 80 mm	60 X 80 mm
4	8125	Upvc extruded glazing bead of appropriate dimension for small series Casement Window Sash	36.5 X 26.7 mm		
5	8126	Upvc extruded (big series) Casement Window Frame	70 X 64 mm		
6	8127	Upvc extruded (big series) Casement Door Frame	70 X 64 mm		
7	8128	Upvc extruded (big series) Casement Window Sash		70 X 74 mm	70 X 60 mm
8	8128	Upvc extruded (big series) Casement Window mullion/Door mullion		70 X 80 mm	70 X 80 mm
9	8129	Upvc extruded (big series) Casement Door Sash		70 X 112 mm	70 X 92 mm
10	8130	Upvc extruded glazing bead of appropriate dimension for big series Casement widow/Door Sash	42.5 X 26.7 mm		
11	8131	Upvc extruded glazing bead of appropriate dimension for small series Sliding Window / Door Sash	19.0 X 26.7 mm		
12	8132	Upvc extruded glazing bead of appropriate dimension for big series Sliding Window/Door Sash	28.0 X 26.7 mm		
13	8133	Upvc extruded (small series) 2 track Sliding Window/Door Frame	60 X 44 mm		
14	8134	Upvc extruded (big series) 2 track Sliding Window/Door Frame	70 X 50 mm		
15	8135	Upvc extruded (small series) 3track Sliding Window Frame	108 X 44 mm		
16	8136	Upvc extruded (big series) 3 track Sliding Window/Door Frame	136 X 50 mm		
17	8137	Upvc extruded (small series) 2 track / 3 track Sliding Window Sash	38 X 68 mm		
18	8138	Upvc extruded (big series) 2 track / 3 track Sliding Window Sash	48 X 68 mm		

S. No.	Product Code as per DSR 2016	Description/Types of Window and Door Systems as per DSR 2016	LOTUS WIIINDOORS*		
			Frame	Sash / Shutter Opening	
			(in mm)	Outward	Inward
19	8139	Upvc extruded (small series) 2 track / 3 track Sliding Door Sash	38 X 80 mm		
20	8140	Upvc extruded interlock of appropriate dimension for small series Sliding Window Sash			43 X 32 mm
21	8141	Upvc extruded interlock of appropriate dimension for big series Sliding Window Sash	Window		46.7 x 40.5 mm
21	8141	Upvc extruded interlock of appropriate dimension for big series Sliding Door Sash	Door		46.7 x 48.5 mm
22	8142	Upvc extruded inline adopter of appropriate dimension for big series Sliding Window/Door Sash			41.4x27 mm
23	8143	Upvc extruded (big series) 2 track / 3 track Sliding Door Sash	48 X 84 mm		

In addition to above profile sections, the customized requirements are also met.

1.3 Assessment

1.3.1 Scope of Assessment

Scope of assessment included conformance of fabricated uPVC Door and Window System to the specified requirements for use as building fenestration in Residential, Commercial, Institutional & Industrial buildings.

1.3.2 Basis of Assessment

Assessment of the suitability of the system is based on the followings;

- Test reports for uPVC extruded profiles for parameters as physical, material and durability characteristics such as Dimension and tolerances, Linear weight of the main profiles, Heat reversion, Resistance to impact, Behaviour after heating, Strength of welded corners and T- joints, Resistance to weathering, Flexural modulus of elasticity, Tensile impact strength, fire Classification, Surface spread of flame etc. by multiple Laboratories namely – Atharva laboratories Pvt. Ltd, Noida, SKZ-Testing GmbH, Germany, SKZ-TeConA GmbH, Germany, ERA Fire Test Laboratory, Turkey, & ATMY Analytical Labs Pvt. Ltd., Faridabad, Haryana.
- Test reports for uPVC Doors and Windows for resistance to weather conditions including for Air infiltration, Water Penetration and Structural performance with tests conducted at Winwall Technology India Pvt. Ltd. & IFT, Rosenheim, Germany.
- Quality Assurance Plan followed by PAC Holder at **Annexure-1**.

- iv. The inspection of the Manufacturing facility at Sonipat, Haryana of the Agency, review of manufacturing parameters & interaction with technical persons.

1.4 Uses of uPVC Door & Window System

Door & Windows systems are designed to connect for indoor to outdoors. It needs to provide the inhabitant safety from all odds like rain, wind, water, noise etc. & ensure smooth operation during its usage.

1.4.1 Special Aspects of Use/ Limitations

The door & window system may have some decolouration when exposed to harsh sunlight for extended periods.

1.5 Conditions of Certification

1.5.1 Technical Conditions

Raw materials and the finished product shall conform to the requirements of the prescribed specifications.

1.5.2 Quality Assurance

The Certificate Holder shall implement & maintain a quality assurance system in accordance with Quality Assurance Plan.

1.5.3 Handling of User Complaints

The Certificate holder shall provide quick redressal to Consumer/user complaints, which proved reasonable & genuine, and within the conditions of warranty provided by it to customer/purchaser.

As part of PACS Certification, it shall maintain data on such complaints with a view to assess the complaint satisfaction and suitable preventive measures taken.

1.6 Certification

On the basis of assessment given in Part 3 of this Certificate & subject to the conditions of Certification, use & limitations set out in this Certificate and if selected, installed & maintained as set out in Part 1&2 of this Certificate, the UPVC Window & Door System covered by this Certificate are fit for use set out in the Scope of Assessment.

PART 2: CERTIFICATE HOLDER'S TECHNICAL SPECIFICATIONS

2.1 General

The PAC holder shall fabricate the uPVC Door & Window System in accordance with the requirements specified in the relevant Standards (See Part 5). In addition it shall follow the Company standards specifying requirements of these sections for various materials used in the manufacturing of the product.

2.2 Specifications of the Product

The manufacturer shall only use the raw materials supplied with the relevant documents/ prescribed as per Quality Assurance Plan. The raw materials shall be subject to agreed controls and tests by the manufacturer before acceptance.

2.2.1 Raw materials

Raw Material/component	Source	Specification	If quality certified in any form, state
UPVC profiles along with Gaskets & Weather stripping	Deceuninck	uPVC Class-B	Quality Certified by Deceuninck*

*Test Reports from Deceuninck regarding Quality of Profiles, which is based on the raw materials as Poly Vinyl chloride, Calcium carbonate (Maximum 9.5% - Maximum 16% for Co-ex), Titanium dioxide (Minimum 6%), stabilizer (Ca-Zn) and Impact modifier. Testing & classification of Gaskets are done as per EN 12365.

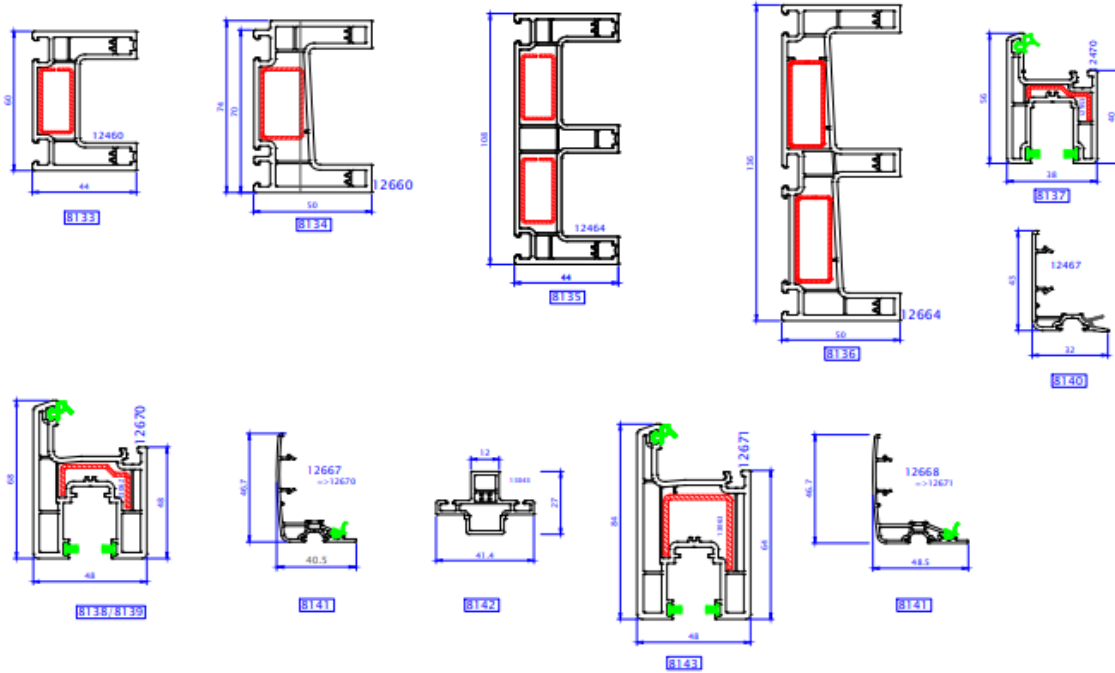
The other raw materials as Glass & hardware are sourced locally from Saint Gobain, Pulse & Assa Abloy respectively conforming to specified standards.

2.2.2 The Profile sections for uPVC Doors & Windows

The big & small series of profile sections as per the Type of Product in 1.2.4.1 above, are as per the details below;

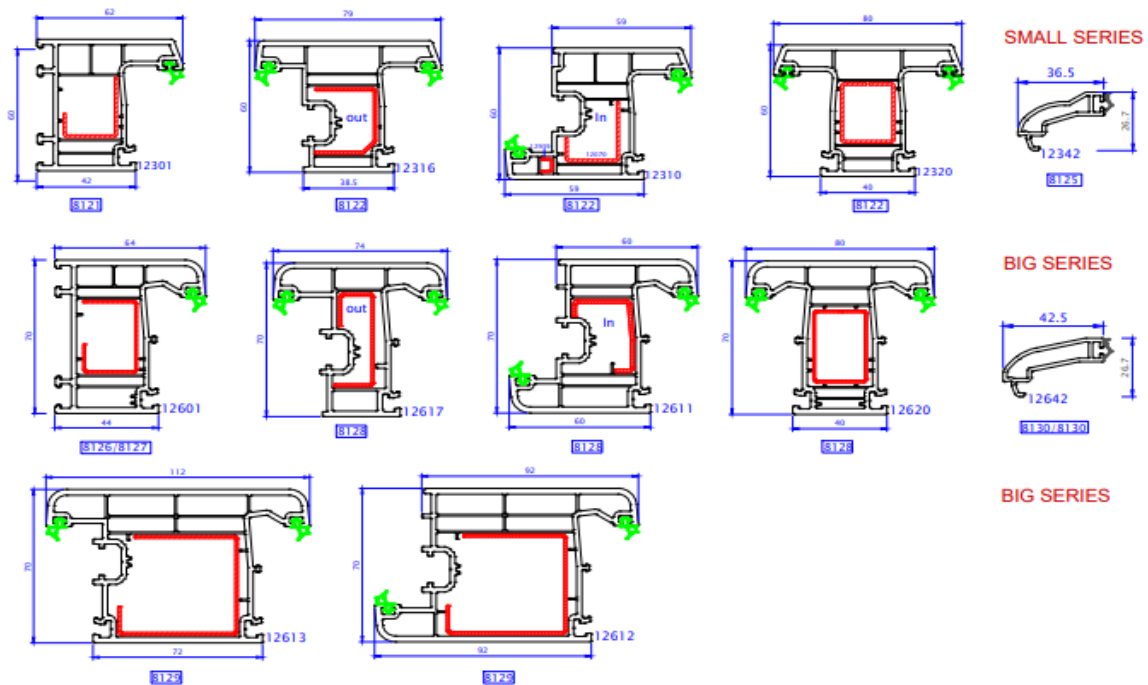
SYSTEM OVERVIEW

Main Profiles Sliding Series



SYSTEM OVERVIEW

Main Profiles Casement Series



2.2.3 Performance Requirements of uPVC Door & Window Profile Section, and fabricated Doors & Windows

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
a) Performance Requirements of uPVC Profile Section					
1	Resistance to impact of main profiles by falling mass	Resistance to impact by falling mass (Falling mass 1000 gm & falling height 1000 mm for sample stored at -10°C), with no rupture in the tested external sight surface	EN 12608		Tested for Class I, with No Defects
2	Dimensions (Main profiles)	i) Depth (d) ≤ 80 : ± 0.3 ii) Depth (d) > 80 : ± 0.3 iii) Overall width (w): ± 0.5		mm	Within the Limits,
3	Straightness	Deviation from the straightness shall be ≤ 1 mm for a length of 1 mt,		mm	0.2
4	Heat Reversion	i) The Dimension change for Sight surfaces shall be $\leq 2\%$. ii) The Difference between the sight surfaces shall be ≤ 0.4	EN 479	mm	i) 1.1-1.3% ii) 0.1-0.3 (The values of different specimens were within the limits)
5	Behaviour after heating at 150 °C (Heat ageing- Main Profile)	The profiles shall show no defects.	EN 478		No defects
6	Welding Strength	i) Minimum 35 N / mm ² (For compression Bending) ii) Minimum 25 N / mm ² (for Tensile Bending)	EN 514	N/mm ²	i) 55 N / mm ² -For compression bending, ii) 54.2 N / mm ² - For Tensile bending

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
7	Artificial Weathering Test	For severe climate (S): An exposure time of approximately 6000 h with 12 GJ of Xenon Light.	DIN EN 513	GJ	Met the requirements
8	Impact Strength after artificial Weathering of main profile	Shall not drop by > 40 % to the value of unweathered sample	ISO 179-1/1fA,	mm	3.70%
9	Vicat Softening Temperature	Shall be $\geq 75^{\circ}\text{C}$	ISO 306	$^{\circ}\text{C}$	82
10	Flexural Modulus Elasticity	Shall be ≥ 2200	ISO 178	N/mm ²	3054
11	Charpy notched Impact Strength	Shall be ≥ 20	ISO 179/1eA	KJ/m ²	21
12	Tensile Impact Strength	Shall be $\geq 600 \text{ kJ/m}^2$	EN ISO 8256	KJ/m ²	939
13	Fire Surface Spread	For -Class 1 <165+25	BS 476 Part 7 & 12	mm	52
14	Fire Behaviour	--	EN 13501-1		C,S3,D2
15	Density	--	EN ISO 1183	gm/cm ³	1.45
b) Performance Requirements of Door & window system					
16	Water Tightness	--	EN 12208	Pa	5A for (60 mm) & 6A for (70mm series)
17	Air permeability	--	EN 12207	Pa	2 for (60 mm) & 3 for (70mm series)
18	Resistance to Wind	--	EN 12210	Pa	A3 (60 mm) & A4 for (70 mm series)
19	Noise Reduction	Varies with combination of profiles system, glass & type of window	EN ISO 401-1	dB	Upto 32 db for Sliding 70mm series & up to 33dB for Casement 60 mm series

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
20	u-Value	Varies with combination of profiles system, glass & type of window	EN 12412	W/M ² K	U _f : 2.0 for Sliding 70mm series & U _f : 1.4 for Casement 60 mm series

2.2.4 Special features of the product;

- i. Ease of Installation and Usage: the uPVC doors & windows fabricated & finished in a factory/ controlled condition, enables it achieve alignment accuracy & help in ease of installation and smooth operation during its usage.
- ii. Appearance and Aesthetics: there is large product range including customized solutions, which comes with good appearance and aesthetics.
- iii. Resistance to Water and Moisture: The product provides good resistance to water and moisture penetration.
- iv. Thermal & Sound Insulation: the product exhibits good thermal & sound insulation.
- v. Provision of grills: The provision for grills can be made as per the requirements.

2.3 Manufacturing Process (Production Line) & Machinery

The Shop drawings and sectional details are submitted for the Approval from the Client / PMC / Consultant. All drawings and Tender measurements are fed in Software systems before production planning. After confirmation of drawings and initiation of production planning, the raw materials are procured as per Schedule or planned lot. Cutting of profiles as per desired angle is done by Double Head Cutter machine. If mullions are required, Milling machines are used for mullions having Straight or V-Notch cuts. Through precision (Copy) Routing machine the hardware holes & water drainage holes are done. Full length GI reinforcements are inserted into uPVC Profiles, which are screwed for co-strengthening with profiles. Holes of 8-12mm are done for fasteners fitting or adhesions with walls & lintels at site. Joining the Cut uPVC sections with each other are done at high melting temperatures on Machines called Thermal welders. Corner cleaning is done on CNC machines for finishing at the joint welded parts of uPVC windows frames and shutters. The fitting of suitable hardware items are done at the final assembly stage. Cutting of glazing bead is done and fixing it into frames / shutters to hold Glass. Glass are fixed in the shutters or frames as per requirement. Ready Windows are packed as per project & Industry standards for

despatch to the site. Installation of door/Window is done at site, with sealing the cavity gaps with sealants while handing over to the client for usage.

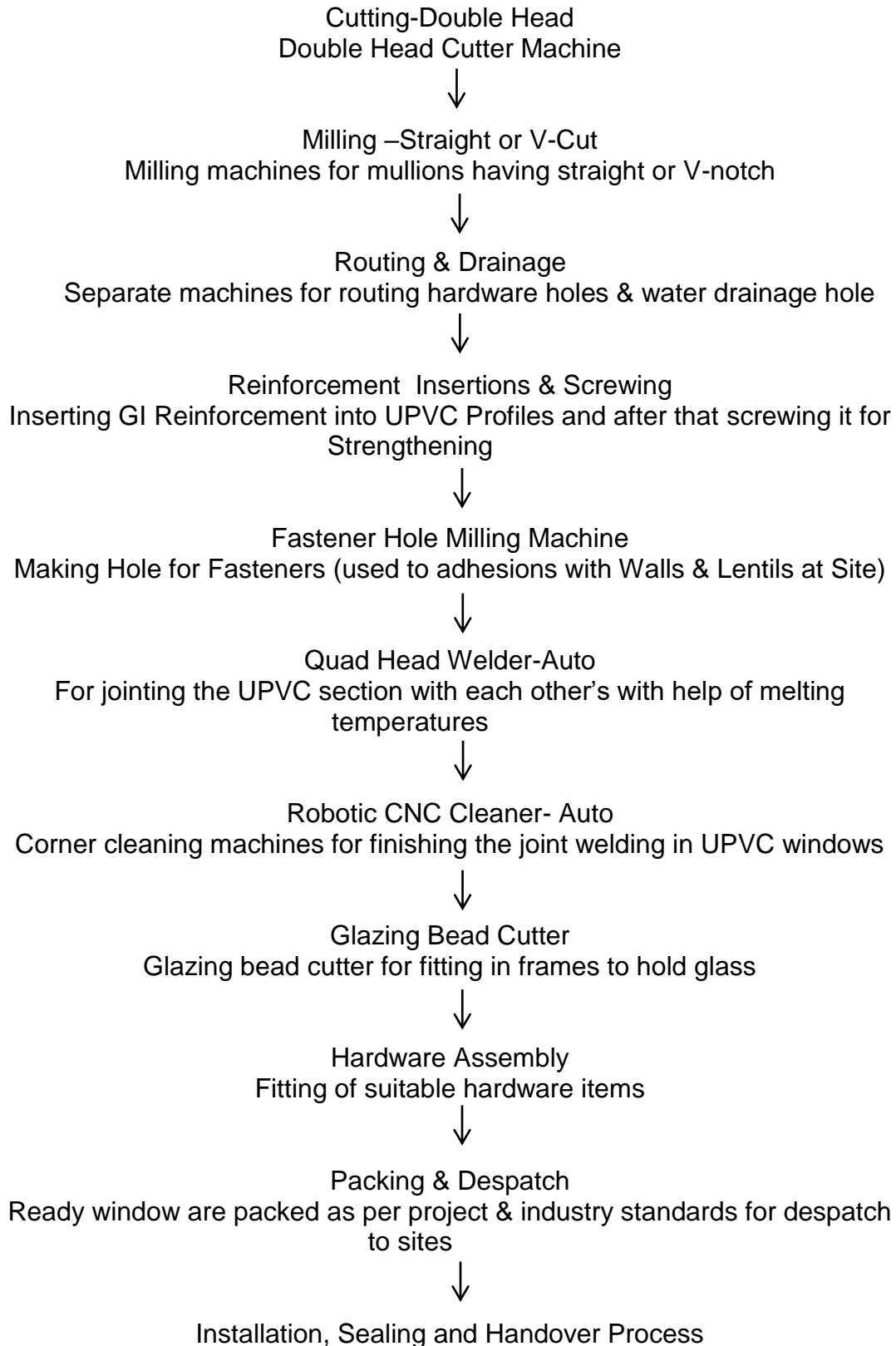


Fig. 1 Quad Weld Machine



Fig. 2 CNC Robotic Processing

Manufacturing Process Flow Chart is shown as below:



Installation of windows at site, sealing cavity gap sealants & handover to client for usage

2.3.1 Manufacturing Machinery available with the Agency

S. No.	Machine	Nos.
1.	Two Head Automatic Cutter With Bar Coder	1
2.	Quad Head Thermal Welder (4 Head Corner Welder)	4 sets
3.	Robotic Line for CNC Corner Cleaning	1 Auto & 1 Semi Auto
4.	Double Head Cutter Machine	2 sets
5.	Milling Machines for Mullions having Straight / V-notch	2 sets
6.	Separate Machines for Routing Hardware holes & Water Drainage hole	2 sets
7.	Fastener Hole Milling Machine	2 sets
8.	Glazing Bead Cutter	1 Auto & 1 Manual

2.3.2 Fabrication of UPVC Door & Window System

The fabrication of the uPVC Door & Window System carried out as per the requirement of the project/customer in the computerized semi-automatic plant at Rai (Distt Sonepat) as per the standard procedure. For the production line ISO certification has been obtained by the company.

Provision of Grill in windows

Grills in windows can be provided in different types based on typology of windows, as per the details below:

Option-1. Inside the Glass insulation. It can be used in double glazing with a 12mm air gap for 12mm SS Pipes making the Grills in the same space.

Option-2. For Casement openable window, the Adaptor Profile System is attached with basic Frame to extend it and thus providing the space to insert grill ends inside the adaptor profiles (inside the window).

Option-3. For sliding windows, the Adaptor profiles can be attached inside or extra track can be added to fit the Grill with frame screwed on add-on track only.

2.3.3 Inspections & Testing

Inspections & testing shall be done at appropriate stages of manufacturing process. The inspected products shall be stored & packed to ensure that no damage occurs during transportation, as per the industrial norms. As part of

quality assurance, regular in-process inspections shall be carried out by the trained personnel of the PAC holder.

2.3.4 Storage & Handling of the Product

Storage - Final manufactured product lot sample tested for required specifications/smooth working, are to be packed for despatch, as per the industrial norms.

Handling - Product needs to be packed & handled as per industry standards or contract terms.

2.4 Maintenance

The product is practically maintenance free, however, it shall be installed strictly as per the instructions contained in the technical literature/ guidance of PAC Holder.

2.5 Skills /Training needed for installation

The installation at site of the product is required to be carried out by the trained professionals of the company.

2.6 Guarantee/Warranty provided by the PAC Holder

The PAC Holder shall provide necessary guarantees/ warranties on mutually agreed terms & conditions with the client.

2.7 Services provided by the PAC holder to the customer

The PAC holder shall provide pre-sale advisory regarding the product. Customer/user may obtain from the PAC holder details of the advice that may be provided to him.

The PAC holder shall also provide after sales service on customer to customer basis. These include items like pre-finishing, trouble shooting in fixing and usage of the doors & windows. Users / Customers shall ascertain from the PAC holder the type of services and the conditions, the PAC holder is prepared to provide.

PART 3: BASIS OF ASSESSMENT AND BRIEF DESCRIPTION OF ASSESSMENT PROCEDURE

3.1 Assessment

3.1.1 Technical Assessment

The technical assessment was done as per provisions of the Standards listed in Part 5 of this Certificate.

3.2 Various Tests Performed

Assessment of the suitability of the UPVC Doors & Windows Systems is based on:

3.2.1 Test reports submitted by the Agency for uPVC extruded profiles including for physical & material including durability parameters;

- i. Physical & Material Assessment by Aatharva Laboratory, Noida, U.P.: The testing of Window Profile were conducted for parameters as Tensile strength, Hardness, Density, Heat reversion, Resistance to impact by falling mass, Behaviour after heating, Colour fastness etc.. The requirements were met in test results for the relevant tests. The tests were carried out as per IS 13360-1017 / ISO 6612-1980 / ISO 4892-200.

Test completion date – February 22, 2022

S. No.	Name of the Test	Test method	Unit	Requirement	Observation
1.	Tensile Strength	IS 13360-5 (sec-2): 2017	N/mm ²	6 (Min)	11.8
2.	Elongation at Breakage	IS 13360-5 (sec-2): 2017	%	200 (Min)	106
3.	Vicat softening temperature (VST) i) At 10N ii) At 50N	IS 13360-6 (sec-11): 2004 (RA 2020)	°C	72 (Min)	107.3 95.3
4.	Hardness	IS 13360-5 (sec-11): 2013 (RA 2018)	Shore-A	70 (Min)	71
5.	Density	IS 12235-14-2004 (RA 2019)	g/cc	0.51-0.59	1.4
6.	Heat reversion @100±20°C for 1 hour	ISO 6612-1980	%	Shall not be greater than 2	1.1
7.	Heat ageing @ 150±2°C for 1 hour	ISO 6612-1980	-	No bubble or crack shall appear	No bubble or crack was observed

S. No.	Name of the Test	Test method	Unit	Requirement	Observation
8.	Resistance to impact by falling mass @ temp. 10°C at 1 hour, load- 1kg,height-1 meter	ISO 6612-1980	-	No cracking through entire wall	No crack
9.	Colour fastness for 100 hrs	ISO 4892-200	Rating	4 (Min)	4-5

- ii. Physical & Material Assessment by SKZ-Testing GmbH, Germany: The Testing & Classification of Window Profile for the test conducted for parameters as Appearance, Dimension and tolerances, Linear weight of the main profiles, Heat reversion, Resistance to impact of main profiles by falling mass, Behaviour after heating & Strength of welded corners and T- joints of the main profile. The requirements were met in test results. The tests were carried out as per EN 12608.

Test completion date – January 20, 2017

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
1	Resistance to impact of main profiles by failing mass	Resistance to impact by falling mass (Falling mass 1000 gm & falling height 1000 mm for sample stored at -10°C), with no rupture in the tested external sight surface	EN 12608		Tested for Class I, with No Defects
2	Dimensions (Main profiles)	i) Depth (d) ≤ 80 : ± 0.3 ii) Depth (d) > 80 : ± 0.3 iii) overall width (w): ± 0.5		mm	Within the Limits,
3	Straightness	Deviation from the straightness shall be ≤ 1 mm for a length of 1 m,		mm	0.2
4	Heat Reversion	i) The Dimension change for Sight surfaces shall be ≤ 2 %. ii) The Difference between the sight surfaces shall be ≤ 0.4	EN 479	mm	iii) 1.1-1.3% iv) 0.1-0.3 (The values of different specimens were within the limits)
5	Behaviour after heating at 150 °C (Heat ageing-	The profiles shall show no defects.	EN 478		No defects

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
	Main Profile)				
10	Welding Strength	i) Minimum 35 N / mm ² (For compression Bending) ii) Minimum 25 N / mm ² (for Tensile Bending)	EN 514	N/mm ²	ii) 55 N / mm ² -For compression bending, ii) 54.2 N / mm ² - For Tensile bending

- iii. Physical & Material Assessment including Durability Characteristics by SKZ-TeConA GmbH, Germany : The testing of Resistance to weathering, Classification & Material characteristics were conducted. The test parameters under material characteristics included determination of Vicat softening temperature, Charpy notched impact strength, Flexural modulus of elasticity and Tensile impact strength. The various requirements were fulfilled.

Test completion date – March 10, 2009

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
1. 1	Artificial Weathering Test	For severe climate (S): An exposure time of approximately 6000 h with 12 GJ of Xenon Light.	DIN EN 513	GJ	Met the requirements
2.	Impact Strength after artificial Weathering of main profile	Shall not drop by > 40 % to the value of unweathered sample	ISO 179-1/1fA,	mm	3.70%
3. 2	Vicat Softening Temperature	Shall be $\geq 75^{\circ}$ C	ISO 306	$^{\circ}$ C	82
4. 3	Flexural Modulus Elasticity	Shall be ≥ 2200	ISO 178	N/mm ²	3054
5.	Charpy notched Impact Strength	Shall be ≥ 20	ISO 179/1eA	KJ/m ²	21
6.	Tensile Impact Strength	Shall be ≥ 600 kJ/m ²	EN ISO 8256	KJ/m ²	939

- iv. Fire Test by Era Fire Test Laboratory, Turkey: Test for classification of reaction to fire in accordance with EN 13501 were carried out. The test included Reaction to fire behaviour (C), Smoke production (s3), & Flaming droplets (d2).

Test completion date – March 17, 2015

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
1	Fire Behaviour	--	EN 13501-1		C,S3,D2

- v. Surface spread of Flame1997 at ATMY Analytical Labs Pvt. Ltd., Faridabad, Haryana: Test for classification of the surface spread of flame of the specimen in composite was carried out as per BS 476 Part-7 &12. The sample tested had “Class-1” surface spread of flame.

Test completion date – November 30, 2017

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
1	Fire Surface Spread	For -Class 1 <165+25	BS 476 Part 7 & 12	mm	52 (Class-1)

- i. Test reports for UPVC Window and Door for resistance to weather conditions by Winwall Technology India Pvt. Ltd : Test reports for UPVC sliding Window (60- size 1500(W) x 2400(H) mm) and sliding Door(70- size 2000(W) x 2400(H) mm) for resistance to Weather conditions including for Air infiltration, Water Penetration and Structural Performance.

Test completion date - September 08, 2014

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
1.	Water Tightness	--	EN 12208	Pa	5A for (60 mm) & 6A for (70mm series)
2.	Air permeability	--	EN 12207	Pa	2 for (60 mm) & 3 for (70mm series)
3.	Resistance to Wind	--	EN 12210	Pa	A3 (60 mm) & A4 for (70 mm series)

- ii. Test reports for UPVC Window for Noise Reduction & U Value by IFT, Rosenheim, Germany: The test for Noise Reduction & U Value for 70 mm series sliding window & 60 mm series casement window were carried out.

Date of Testing: April 2007

S. No.	Performance characteristic	Minimum Requirement	Reference Standard	Unit	Result
1.	Noise Reduction	Varies with combination of profiles system, glass & type of window	EN ISO 401-1	dB	Upto 32 dB for Sliding 70mm series & up to 33 dB for Casement 60 mm series
2.	u-Value	Varies with combination of profiles system, glass & type of window	EN 12412	W/M ² K	U _f : 2.0 for Sliding 70mm series & U _f : 1.4 for Casement 60 mm series

3.2.2 The Quality assurance plan followed by the Agency.

3.3 Project list for supply & installation of Lotus uPVC Doors & Windows

The manufacturer has supplied the uPVC Door and Window as per the details given below;

S. No.	Project Name	Developer / PMC	Location	Year of Completion
1.	Astrum La Regencia	Astrum Value	Panipat	2014
2.	RG Residency	RG Group	Noida	2015
3.	Omaxe Forest Spa	Omaxe Ltd	Faridabad	2015
4.	Corona Optus	Corona Projects	Gurugram	2016
5.	Corona Gracieux	Corona Projects	Gurugram	2017
6.	SunWorld Vanalika	SunWorld Developers	Noida	2017
7.	Microtek GreenBurg	Microtek Infrastructure	Gurugram	2018
8.	Shri Laxmi Celebrations	Shri Laxmi Buildcon	Indirapuram	2019
9.	IIT Mandi Block A10	IIT Mandi / NBCC	Kamand, HP	2019
10.	RML Lucknow	RML Lucknow	Lucknow	2019
11.	ATS Pristine2 TowerP4	ATS Infrastructures	Noida	2021
12.	Mapso MountVille	Mapsko Builders	Gurugram	2021
13.	IIT Delhi Block-4	IIT Delhi / NBCC	Delhi	2022

The Agency was awarded Best project execution award for the year 2019 by Deceuninck, Belgium.

Lotus |
WiINDOORS
Doors Windows & Allied Systems



Fig. 3 Close view of uPVC casement window



Fig. 4 Window installation in IIT, Mandi



Fig. 5 Window installation in IIT, Delhi (Top extended floor)

PART 4: STANDARD CONDITIONS

This certificate holder shall satisfy the following conditions:

1. The certificate holder shall continue to have the product reviewed by BMBA.
2. The product shall be continued to be manufactured according to and in compliance with the manufacturing specifications and quality assurance measures which applied at the time of issue or revalidation of this certificate. The Scheme of Quality Assurance separately approved shall be followed.
3. The quality of the product shall be maintained by the certificate holder.
4. The product user should install, use and maintain the product in accordance with the provisions in this Certificate.
5. This certificate does not cover uses of the product outside the scope of this appraisal.
6. The product is appraised against performance provisions contained in the standards listed in Part-V. Provisions of any subsequent revisions or provisions introduced after the date of the certificate do not apply.
7. Where reference is made in this Certificate to any Act of Parliament of India, Rules and Regulations made there under, statutes, specifications, codes of practice, standards etc. of the Bureau of Indian Standards or any other national standards body and the International Organization for Standardization (ISO), manufacturer's company standards, instruction/manual etc., it shall be construed as reference to such publications in the form in which they were in force on the date of grant of this Certificate (and indicated in Part V to this Certificate)
8. The certificate holder agrees to inform BMBA of their distributors / licensees whenever appointed by him and agrees to provide to BMBA a six monthly updated list thereof.
9. The certificate holder agrees to provide to BMBA feedback on the complaints received, the redressal provided, and the time taken to provide redressal on complaint to complaint basis as soon as redressal is provided. BMBA agrees to provide the certificate holder the user feedback received by it, if any.
10. If at any time during the validity period, PACH is unable to fulfil the conditions in his PAC, he should on his own initiative suspend using the PAC and notify Chairman, TAC the date from which he has suspended its use, the reason for suspension and the period by which he will be able to resume. He shall not resume without the prior permission of BMBA. He shall also inform, simultaneously, his agents, licensees, distributors, institutional, government,

public sector buyers, other buyers and all those whom he has informed about his holding the PAC. He shall also inform all those who buy his product(s) during the period of suspension. He shall provide to BMBA at the earliest the list of who have been so informed by him.

11. In granting this Certificate, BMBA takes no position as to:
 - a. The presence or absence of patent or similar rights relating to the product;
 - b. The legal right of the Certificate holder to market install or maintain the product;
 - c. The nature of individual installations of the product, including methods of workmanship.
12. BMTPC and the Board of Agreement of BMTPC (BMBA) take no position relating to the holder of the Performance Appraisal Certificate (PACH) and the users of the Performance Appraisal Certificate (PAC) respecting the patent rights / copy rights asserted relating to the product / system / design / method of installation etc. covered by this PAC. Considerations relating to patent / copy rights are beyond the scope of the Performance Appraisal Certification Scheme (PACS) under which this PAC has been issued. PACH and users of this PAC are expressly advised that determination of the Claim / validity of any such patent rights / copy rights and the risk of infringement of such rights are entirely the responsibility of PACH on the one hand and that of the users on the other.
13. It should be noted that any recommendations relating to the safe use of the product which are contained or referred to in this Certificate are the minimum standards required to be met with when the product is installed, used and maintained. They do not purport in any way to restate or cover all the requirements of related Acts such as the Factory Act, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future, nor is conformity with the provisions of this Certificate to be taken as satisfying the requirements of related Acts.
14. In granting this Certificate, BMTPC and BMBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the use of this product.
15. The certificate holder indemnifies BMBA, its officers and officials involved in this assessment against any consequences of actions taken in good faith including contents of this certificate. The responsibility fully rests with the certificate holder and user of the product.
16. The responsibility for conformity to conditions specified in this PAC lies with the manufacturer who is granted this PAC. The Board (BMBA) will only consider requests for modification or withdrawal of the PAC.

17. The PAC holder shall not use this certificate for legal defence in cases against him or for legal claims he may make from others.



Place: New Delhi
Date of issue: 18/07/2023

Chairman TAC & for and on behalf of
Member Secretary, BMBA

PART 5: LIST OF STANDARDS & CODES

5.1 Company standards of the PAC holder the branded design and specification as the raw materials and finished product are as specified by the manufacturer. The PAC holder has to make to available the company a standard to the Clients according to which testing has been done.

5.2 The list of Standards for reference are as per the details below;

IS 277 : 2018	Galvanized steel sheets (plain and corrupted) – specification
IS 513 : 2016(Part 1,2)	Cold reduced low carbon steel sheet and strip
IS 875 : 2015 (Part 3)	Code of practice for Design Loads; For Building and Structures –Part 3 Wind Load
IS 1079 : 2017	Hot rolled carbon steel sheet and strip-specification
IS 3400 : 2019(20/21/22)	(Part 2,4,10,20,23) Methods of test for vulcanized rubber
BS 6262 : 2017	(all parts), Glazing for buildings
BS 6375 : 2009	(all parts), Performance of windows and doors
BS 7412 : 2014	Specification for windows and door sets made from unplasticized polyvinylchloride (PVC-U) extruded hollow profiles
BS 7722: 2010	Surface covered PVC-U profiles for windows and doors-specification
BS 7950: 1997	Specification for enhanced security performance of windows for domestic applications
BS 8213-4: 2007	Windows, doors and roof lights, Code of practice for the survey and installation of windows and external door sets
EN 485-2: 2016	Aluminium and Aluminium alloys – Sheet, strip and plate- part 2 mechanical properties
EN 514 : 2000	unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors-Determination of the strength of welded corners and T-joints
EN 1026 : 2016	Windows and doors-Air permeability-Test method
EN 1027 : 2016	Windows and doors-Water tightness-Test method
EN 1191 : 2013	Windows and doors-Resistance to repeated opening and closing-Test method
EN 1279 : 2005	(all parts), Glass in building – insulating glass units
EN 1670 : 2009	Building hardware-Corrosion resistance Requirements and test methods
EN 1991 : 2005	Euro code1: Action on structures- Part1.1: General actions-Densities, self- weight, imposed loads for buildings
EN 12207: 2016	Classification air permeability
EN 12208: 2000	Classification water tightness
EN 12210: 2016	Classification wind resistance

EN 12211: 2016	Windows and doors-Resistance to wind load-Test method
EN 12217: 2015	Doors, operating forces, Requirements and classification
EN 12329: 2000	Corrosion protection of metals, Electrode posited coatings of zinc with supplementary treatment on iron or steel
EN 12400: 2000	Windows and pedestrian doors Mechanical durability Requirements and classification
EN 12519: 2018	Windows and doors Terminology
EN 12608: 2004	Unplasticized polyvinylchloride (PVC-U)profiles for the fabrication of windows and doors-Classification, requirement and test methods
EN 12758: 2011	Glass in building Glazing and airborne sound insulation, Product description and determination of properties
EN 13049: 2003	Windows Soft and heavy body impact, Test method, safety requirements and classification
EN 13115: 2020	Windows, Classification of mechanical properties, Racking, torsion and operating forces
EN 14351: 2016	Windows and pedestrian door sets, Product standard, performance characteristic-Part 1: Windows and external pedestrian door sets without resistance to fire and smoke leakage characteristics but including external fire performance for roof windows
EN ISO 105-A01	Textiles-Tests for colour fastness
EN ISO 1461 : 2022	Hot dip galvanized coatings on fabricated iron and steel articles, Specifications and test methods
EN ISO 4042 : 2022	Fasteners- Electroplated coatings
EN ISO 3506 : 2020	(all parts), Mechanical properties of corrosion-resistant stainless steel fasteners, Bolts, screws and studs
EN ISO 9227 : 2022	Corrosion tests in artificial atmospheres-Salt spray tests
ISO 10140-3 : 2021	Acoustics–Laboratory measurement of sound insulation-Part 3: Measurement of impact sound insulation
ISO 10077-1 : 2017	Thermal performance of windows, doors and shutters- Calculation of thermal transmittance –Part 1: General

CERTIFICATION

In the opinion of Building Materials & Technology Promotion Council's Board of Agreement (BMBA), **uPVC Door & Window System** is satisfactory if used as set out above in the text of the Certificate. This Certificate PAC No. 1069-C/2023 is awarded to **M/s Lotus Fenstek, Sonipat, Haryana.**

The period of validity of this Certificate is for a period of one year i.e. from **18/07/2023** to **17/07/2024** as shown on Page 1 of this PAC. This Certificate consists of pages 1 to 32.



Dr. Shalish Kr. Agrawal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing and Urban Affairs, Govt. of India
Core 5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi-110003



On behalf of BMTPC Board of Agreement Chairman, Technical Assessment Committee (TAC) of BMBA & Member Secretary, BMTPC Board of Agreement (BMBA) Under Ministry of Housing and Urban Affairs, Government of India

Place: New Delhi, India

Date: 18/07/2023

PART 6: LIST OF ABBREVIATIONS

BMBA	Board of Agreement of BMTPC
BMTPC	Building Materials and Technology Promotion Council
CPWD	Central Public Works Department
ED	Executive Director of BMTPC
IO	Inspecting Officer
MS	Member Secretary of BMBA
PAC	Performance Appraisal Certificate
PACH	PAC Holder
PACS	Performance Appraisal Certification Scheme
SQA	Scheme of Quality Assurance
TAC	Technical Assessment Committee (of BMBA)

PERFORMANCE APPRAISAL CERTIFICATION SCHEME - A BRIEF

Building Materials & Technology Promotion Council (BMTPC) was set up by the Government of India as a body under the Ministry of Housing & Urban Poverty Alleviation to serve as an apex body to provide inter-disciplinary platform to promote development and use of innovative building materials and technologies laying special emphasis on sustainable growth, environmental friendliness and protection, use of industrial, agricultural, mining and mineral wastes, cost saving, energy saving etc. without diminishing needs of safety, durability and comfort to the occupants of buildings using newly developed materials and technologies.

During the year's government, public and private sector organizations independently or under the aegis of BMTPC have developed several new materials and technologies. With liberalization of the economy several such materials and technologies are being imported.

However, benefits of such developments have not been realized in full measure as understandably the ultimate users are reluctant to put them to full use for want of information and data to enable them to make informed choice.

In order to help the user in this regard and derive the envisaged social and economic benefits the Ministry of Housing & Urban Poverty Alleviation has instituted a scheme called Performance Appraisal Certification Scheme (PACS) under which a Performance Appraisal Certificate (PAC) is issued covering new materials and technologies. PAC provides after due investigation, tests and assessments, amongst other things information to the user to make informed choice.

To make the PACS transparent and authentic it is administered through a Technical Assessment Committee (TAC) and the BMTPC Board of Agreement (BMBA) in which scientific, technological, academic, professional organizations and industry interests are represented.

The Government of India has vested the authority for the operation of the Scheme with BMTPC through Gazette Notification No. 1-16011/5/99 H-II in the Gazette of India No.49 dated 4th December, 1999.

Builders and construction agencies in the Government, public and private sectors can help serve the economic, development and environmental causes for which the people and Government stand committed by giving preference to materials and technologies which have earned Performance Appraisal Certificates.

Further information on PACS can be obtained from the website:
www.bmtpc.org

Annexure -1

QUALITY ASSURANCE PLAN

1. Quality Assurance Plan (Designing Level)

- i. Door & Window design is analyzed for durability and product constraints.
- ii. Door & Window design is done as per the wind load consideration & accordingly the raw material specifications are finalized.

2. Quality Assurance Plan (Production Level)

- i. The profiles (uPVC) & other raw materials are sourced from reputed and well known manufacturers, having good quality assurance plan and production capacities.
- ii. The raw materials are checked either at time of receipt in the unit or at time of production, as per raw material nature.
- iii. The final manufactured products lot samples are tested for smooth working. After the testing, the products are packed for dispatch.
- iv. The product is packed as per industry standards or contract terms.

3. Quality Assurance Plan (Installation Level)

- i. During installation at site, the frames are checked in two vectors for alignment & plum verifications.
- ii. Before handing over to the client, the product is tested for smooth working at site.