BMTPC PACS
PERFORMANCE APPRAISAL CERTIFICATION

WPC Door Shutter &WPC Frame

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

Name and Address of Certificate Holder: **M/s Rajshri Plastiwood (Division of M/s Rajshri Production (P) Ltd.) Plot No. 100 & 100A, Sector – II Industrial Area, Pithampur, Distt. Dhar, MP – 454775**
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Performance Appraisal Certificate No.
PAC No.: **1062-C/2022**

Issue No. **01**

Date of Issue: **29/03/2022**

bmtpc

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bmtpc

PACS

PERFORMANCE APPRAISAL CERTIFICATE

FOR

WPC DOOR SHUTTER AND WPC FRAME

ISSUED TO

M/s RAJSHRI PLASTIWOOD

(DIVISION OF M/s RAJSHRI PRODUCTION (P) LTD.)

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	29/03/2022				28/03/2023		
			29/03/2023			28/03/2024		

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Part 1 Certification

1.1 Certificate Holder: M/s Rajshri Plastiwood
(Division of M/s Rajshri Production (P) Ltd.)
Plot No. 100 & 100A, Sector – II Industrial Area,
Pithampur, Dist. Dhar – 454775 (M.P.)
Tel: +91 7292-418801/8821
E-mail: rajshriplastiwood@gmail.com

1.2 Description of the Product

1.2.1 Name of the Product- WPC Door Shutter & WPC Frame

1.2.2 Brand Name – Rajshri Plastiwood

1.2.3 Brief Description- Wood Polymer Composite (WPC) Door shutter and Frame are made of WPC sheet which is extruded from WPC compound. The various additives like, stabilizers, lubricants, fillers, blowing agent etc. as added to virgin PVC Resin (K value 57-60 Suspension Grade) and Natural Fibre (Wood Flour) are fed to a high speed mixer and heated to approximately 120°C using frictional heat. At this temperature the various additives blend and convert into WPC compound.

Special features of the product include;

- Water & moisture resistant,
- High screw & nail holding capacity,
- Good Insulation property,
- Flame Retardant & self-extinguishing in nature,
- Easy to Install, operate & available in various colour options,
- Low maintenance,
- Termite & borer proof,
- The products are fully recyclable,
- No warpage as WPC door is solid, water proof and also of high density.

1.2.4 Types of WPC Products

S.NO.	WPC Solid Panel Door	WPC Flush Door	WPC Moulded Door	WPC Frame
1	Plain	Plain	Plain	Single Rebate Door Frame
2	Single Side Decorative	Single Side Decorative	Single Side Decorative	Double Rebate Door Frame
3	Both Side Decorative	Both Side Decorative	Both Side Decorative	

1.2.5 Size & Thickness of WPC Door shutters and Frame

SI No.	Type of Door	Standard / Customized Door Size	
		Thickness (mm)	Height (ft) X Width(ft)/ Customized
1	Solid WPC Panel Door (Plain)	30mm	7 X 3, 7 X 2.75,7 X 2.5,7 X 2.25
2	Solid WPC Panel Door (Both Side Prelaminated)	30mm	7 X 3, 7 X 2.75,7 X 2.5, 7 X 2.25
3	Solid WPC Door Frame (Panel door)	50mm X 47mm	7 to 9.5
4	Solid WPC Flush Door (Plain)	6mm, 12mm, 18mm, 24mm, 25mm, 28mm, 30mm, 35mm	7 X 3, 7 X 2.75,7 X 2.5,7 X 2.25
5	WPC Flush Door Shutter (One Side Prelaminated)	6mm, 12mm, 18mm, 24mm, 25mm, 28mm, 30mm, 35mm	7 X 3, 7 X 2.75,7 X 2.5,7 X 2.25
6	WPC Flush Door Shutter Decorative (Both Side Prelaminated)	6mm, 12mm, 18mm, 24mm, 25mm, 28mm, 30mm, 35mm	7 X 3, 7 X 2.75,7 X 2.5,7 X 2.25
7	Solid WPC Moulded Door (Plain)	24mm, 25mm, 28mm, 30mm& 35mm	7 X 3, 7 X 2.75,7 X 2.5,7 X 2.25
8	Solid WPC Moulded Door (Painted)	24mm, 25mm, 28mm, 30mm& 35mm	7 X 3, 7 X 2.75,7 X 2.5,7 X 2.25
9	Solid WPC Door Frame	75mm X 50mm, 90mm X 45mm, 100mm X 50mm, 100mm X 65mm, 125mm X 50mm, 150mm X 65mm	7 to 9.5
10	Solid WPC Decorative Door Frame - Single Rebate	125mm X 65mm	7 to 9.5
11	Solid WPC Decorative Door Frame - Double Pattam	125mm X 65mm & 125mm X 80mm	7 to 9.5

1.3 Uses of the product

WPC Door shutters & frames are to be used for internal area as shutters in bathrooms, toilets & kitchen of Houses, Offices, Hospitals, and Factories etc. provided the shutters are installed with appropriate frames and hardware in accordance with good engineering practice.

1.4 Assessment

1.4.1 Scope of Assessment

Scope of assessment included conformance of manufactured WPC Door shutters and frames to the specified requirements for use in building construction as in Residential, Office, Hospital, Factory etc.

1.4.2 Basis of assessment

Assessment of the suitability of WPC Door Shutter and Frame is based on:

i. Test report of 28 mm thick Solid WPC Flush Door Shutter conducted by National Test House, Mumbai for various performances(Dimension and Squareness), General flatness for Twist, Cupping, Warping, Impact indentation, Edge loading, Shock resistance, Buckling resistance, Misuse, Slamming, Screw Withdrawal resistance, meeting the standard requirements of IS 15931-2012,for Solid Panel Foam UPVC Door Shutter.

ii. Test report of 18 mm WPC Sheet conducted by CIPET- Centre for Skilling and Technical Support (CSTS),Bhopal (MP) for testing of Water Absorption, Compressive Strength, Density, Screw Withdrawal Strength, Elastic Modulus, Flammability, Resistance to Spread of Flame.

iii. Test report of 25 mm WPC Sheet conducted by CIPET- Centre for Skilling and Technical Support (CSTS), Bhopal (MP)for testing of Water Absorption, Compressive Strength, Density, Screw Withdrawal Strength, Elastic Modulus, Flammability, Resistance to Spread of Flame .

iv. Test report of 75X50mm WPC Profile (Door Frame) conducted by CIPET- Centre for Skilling and Technical Support (CSTS),Bhopal (MP) for testing of Hardness.

v. Test report of 90X45mm, 125X65 mm and 75 X 50 mm WPC Profile (Door Frame) conducted by CIPET- Centre for Skilling and Technical Support (CSTS),Bhopal (MP)for testing of Water Absorption, Density and Screw Withdrawal Strength.

vi. Test report of 100X50 mm WPC Profile (Door Frame) conducted by CIPET- Centre for Skilling and Technical Support (CSTS),Bhopal (MP) testing of Water Absorption, Compressive Strength, Density, Screw Withdrawal Strength, Elastic Modulus, Flammability, Resistance to Spread of Flame.

vii. Test report of 125X50mm WPC Profile (Door Frame) conducted by CIPET- Centre for Skilling and Technical Support (CSTS),Bhopal (MP) testing of Water Absorption, Compressive Strength, Density, Screw Withdrawal Strength, Elastic Modulus, Flammability, Resistance to Spread of Flame.

viii. Test report of 125X80mm WPC Profile (Door Frame) conducted by CIPET- Centre for Skilling and Technical Support (CSTS),Bhopal (MP) testing of Water Absorption, Compressive Strength, Density, Screw Withdrawal Strength, Elastic Modulus, Flammability, Resistance to Spread of Flame.

ix. Assessment of quality assurance procedures followed by the Certificate holder as per Quality Assurance Plan attached at **Annexure- I**.

1.4.3 Special Aspects of Use/ Limitations

WPC door shutter is not recommended for terraces, back yard, continuously wet locations like small toilets, latrines or small wash area where water spread directly or indirectly from showers, bib cocks etc, on the door shutter or the area regularly water logged.
These doors are known to degrade when exposed to harsh sunlight for extended periods. The sun exposure causes the doors to fade, discolour and become more brittle. This aspect is important when considering exterior doors for facades which receive direct sunlight.

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

1.5.3.1 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.

1.5.3.2 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 WPC Door Shutters and Frames 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 manufacture these WPC Door Shutter and Frame 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 Quality Assurance Plan. The raw materials shall be subject to agreed controls and tests by the manufacturer before acceptance.

2.2.1 Raw materials

S. No.	Name	Specification	Standard
1	Poly Vinyl Chloride (PVC)	Inherent Viscosity, 0.67 - 0.72	ASTM D 1243
		Residual Vinyl Chloride monomer, 1 Max ppm	ASTM D 3749
		Porosity, 0.22 - 0.34 ml/g	ASTM D 3367
		Heat loss at 110°C , 0.30 Max wt%	ASTM D 3030
		Bulk Density , 0.48 - 0.55 g/ml	ASTM D 1895
		Dark resin, 4 Max counts	DJLIC524
2	Calcium Carbonate ($CaCO_{3)}$	Particle size analysis, Dry whiteness, Bulk density, Oil observation, Moisture content	Manufacturer Test Certificate
3	PVC Stabilizer	Physical appearance, Melting point, Iodine number	Manufacturer Test Certificate
4	Calcium Stearate (CS)	Physical appearance, Volatile matters, Calcium as CaO %, Free Acid as Stearic acid	Manufacturer Test Certificate
5	Lead Stearate (LS)	Physical appearance, Volatile matters, Lead as Pbo % w/w, Free acid as Stearic acid	Manufacturer Test Certificate
6	Titanium Dioxide (TiO_2)	TiO_2 content, 92.50 % Min.	Manufacturer Test Certificate
		Oil observation,14 Min & 19 Max	
7	Lubricant Wax	Appearance, Creamish white powder	Manufacturer Test Certificate
		Acid value, 0-3	
		Iodine value, 0-3	
		Melting Point, 50-60	
8	Blowing Agent	PH, 9 -11	Manufacturer Test Certificate
		Moisture, 1%	
		Decomposition temperature, 135 -150^{0}C	

		Gas Evolution, 110 -120 CC/GM Residue on 350 mesh, 1%	
9	Epoxy Plasticizer	Oxirane value, Iodine value, Acid value, Volatile loss, Specific Gravity	Manufacturer Test Certificate
10	Processing Aid	Appearance, Free flowing white powder Moisture content, 1.5% Max Sieve analysis retained on 60 Mesh, 50% Max, Sieve analysis retained on 100 Mesh, 70% Max, Sieve analysis retained on 200 Mesh, 90% Max	Manufacturer Test Certificate
11	Processing Aid LP-90	Appearance, white fluid powder Granularity %, ≥ 98 Volatile component (%), ≤ 1	Manufacturer Test Certificate
12	Processing Aid LP -175	Appearance, white fluid powder Granularity %, ≥ 98 Volatile component (%), ≤1.	Manufacturer Test Certificate
13	Processing Aid LS-530	Appearance, white fluid powder Granularity %, ≥ 98 Volatile component (%), ≤ 1.	Manufacturer Test Certificate
14	Saw Wood Powder	Bulk density, 0.25 to 0.4 gm. /ml	Manufacturer Test Certificate

Raw materials & the finished products shall conform to the requirements of the prescribed specifications;

WPC – The Additives should be selected from the list given in IS 10148:1982 (Reaffirmed 2003)

Mild Steel Frame- Mild steel tube for frame shall meet the requirements IS 4923:1997 (Reaffirmed 2009). Mild steel tube shall be of size 15mm X 15mm for top and bottom rails and 19mm X 19mm for stiles.

Adhesive - Solvent cement used for jointing of panel, stile and rails shall conform to the adhesive properties specified in IS 14182:1994.

2.2.2 Performance Requirements of WPC Sheet

Requirements of (IS 15931)	Visual Appearance	Shall be smooth, clean and free from other hidden internal defects such as air bubbles, pin holes, pits and other foreign inclusion. Slight longitudinal extrusion lines which may be visible but not discernable when felt by hand shall be permissible.
	Density	In accordance with IS 13360 (Part 3/ Sec 1), the density of sheet shall be 0.55 to 0.65 g/cm^3.

	Heat Reversion	Tested by subjection to a temperature of 70 ± 2^0C for 7 days as prescribed in IS 11239 (Part 3), a sheet of 200 ± 20 mm long shall not alter in length by more than 2 percent.
	Impact Strength	Tested by the method prescribed in IS 13360 (Part 5/Sec 5), the sheet shall have no defect such as cracking, tearing or delaminating. The depth of indentation shall be less than 0.3 mm.
	Tensile Strength	In accordance with the procedure given in IS 8543 (Part 5/Sec 1), the tensile strength of sheet shall not be less than 10N/mm^2.
	Flexural Strength	Tested in accordance with the procedure given in IS 13360 (Part 5 / Sec 7), the flexural strength of sheet shall not be less than 20N/mm^2.
	Screw Withdrawal Strength	In accordance with the procedure given in IS 4020 (Part 16), the screw holding capacity of 5 mm thick sheet shall not be less than 1500 N across the face and 1250 N across the edge.
	Thermal Conductivity	Tested in accordance with the procedure given in IS 3346 (Part 5 / Sec 7), the thermal conductivity of sheet shall not be less than 0.07kcal/h/m/°C

2.2.3 Performance Requirements of WPC Door Shutter

S. No.	**Performance Characteristics'**	**Criteria**	**Test Method**	**Specification Requirements (IS 15931 : 2012)**
1	Dimensions & Squareness Test	a) Average Height	As per IS : 4020 (Part 2 & 3)	a) +3 to -0 mm
		b) Average Width		b) +3 to -0 mm
		c) Thickness, mm		c) +2 to -0 mm
		d) Difference in length of diagonal,		d) ≤3 mm
		e) Maximum variation in thickness between 2 points,		e) 0.2 mm
2	Impact Indentation Test	a) Appearance : Cracking & tearing was observed	As per IS : 4020 (Part 5)	a) Satisfactory
		b) Max Depth of depression, mm		b) 0.3 mm Max
3	Edge Loading Test	a) Deflection after 15 minutes in mm under	As per IS : 4020(Part 7)	a) 8 mm Max

S. No.	Performance Characteristics'	Criteria	Test Method	Specification Requirements (IS 15931 : 2012)
		load application		
		b) Residual deflection		b) 0.7 mm Max
4	Shock Resistance Test	Soft & light body impact test observations for any visible damage after 25 blows on each side	As per IS : 4020(Part 8)	No visible damage
5	Buckling Resistance Test	a) Appearance – Observation for deterioration	As per IS : 4020(Part 9)	No Deterioration
		b) Residual deflection, 30min after removal of load, in mm		5 mm Max
6	Misuse Test	Observed for any permanent deformation affecting normal	As per IS : 4020(Part 11)	No permanent Deformation
7	Slamming Test	For any damage at the end of 50 successive impacts	As per IS : 4020(Part 10)	No visible Damage
8	Screw Withdrawal Resistance Test	i) Face Direction & ii) Edge Direction	As per IS : 4020 Part 16)	Min 1000 N

2.2.4 Performance Requirements for WPC door Frame

S. No.	Test Parameter	Test Method	Specification Requirements (DSR 2021)
1	PVC Polymer K Value		58-60 (Suspension Grade)
2	Water Absorption	ASTM D570	
3	Density	IS 13360 Pt. 3/ Sec-I	750 Kg/cum (Min)
4	Screw withdrawal Strength Face Edge	IS 15931: 2012	 2200 N (Min) 1100 N (Min)
5	Compressive Strength	ASTM D695	58 N/mm^2 (Min)
6	Modulus of Elasticity	ASTM D790	900 N/mm^2 (Min)

2.2.5 Hardware

It is recommend that a minimum of three hinges equally spaced with top of the top hinges 100 mm from the top edge of the shutter shall be used.

The shutter stiles can take the hardware like hinges and locks. The construction inside is with solid strips laid side by side so it can also take hardware like hasp and staples (aldrop), sliding bolt (tower bolt).

2.3 Manufacturing Process & Machinery

2.3.1 Manufacturing Process of WPC Sheets

The manufacturing process is divided in two parts, viz.

- Formulation of compound, &
- Extrusion of the mixed compound.

Formulation of compound

Various additives like, stabilizers, lubricants, fillers, blowing agent etc. are added to Virgin PVC Resin (K value 57-60 Suspension Grade) and Natural Fibre (Wood flour) which are the basic raw materials, for achieving the desired properties of the extruded WPC Sheet.

The formulation of the compound is critical and should be such that it reaches the predetermined temperature, and starts foaming after it has travelled in the entire length of the extruder screw and as it just leaves the extruder into the die.

PVC resin, Wood Flour and various additives are fed to a high speed mixer and heated to approximately 120°C using frictional heat. At this temperature the various additives blend into the compound and convert into WPC compound. This compound is then extruded into sheet.

Extrusion of the mixed compound

The WPC compound is fed into the extruder where it is dosed on to the twin screws along with regrind (from edge trimmings and rejects of the WPC Sheet made from the same compound) in a predetermined ratio.

The screws heat the compound through frictional heat and convert the powder into a molten state (melt), which is free flowing. When the melt reaches a predetermined temperature, the blowing agent in the compound breaks-up into its component gases (nitrogen and carbon dioxide), which foam the melt thereby reducing its density. The melt is forced through the outlet of the extruder under high pressure at approximately 200°C into a flat die. It is in the die where the desired thickness etc. of the sheet is determined.

After the melt exits the die in sheet form, it is polished on a three roll calendar where it is cooled to approximately 80°C. Thereafter the sheet is cooled to the ambient temperature on a roller table by atmospheric air whilst it is kept in tension by nip rollers.

To avoid scratches on the sheet masking film is applied at the Haul off and then cut on a guillotine or circular saw in the desired size. Thereafter the sheet is either dispatched or further value addition process like lamination, painting work etc. are carried out, as per the requirement.

The process is automatic in nature and requires manual labor only for material handling.

Manufacturing Process Flow Chart is shown in **Annexure II**

2.3.2 Manufacturing Machinery

S. No.	Machine	Nos.	S. No.	Machine	Nos.
1.	Extrusion Machines	8	35.	Screen Printing M/c	1
2.	Profile Machines	4	36.	Double Mitre Saw for Aluminum & PVC Profile	1
3.	Grinders	9	37.	PVC Win -door Glazing bead saw M/c	1
4.	Pulvarisor	3	38.	PVC Win -Door lock hole processing M/c	1
5.	Film cutting machine	1	39.	V-Cutting saw for aluminum & plastic profile	1
6.	Mixer Machines	7	40.	Ending Milling M/c for aluminium& PVC window & door	1
7.	Chilling Plants	8	41.	PVC Profile Arch Bending M/c with tank	1
8.	Cooling Tower	3	42.	PVC Wind-Door Mid frame cutting Saw	1
9.	Air Compressor	6	43.	PVC Win Door 4 head welding M/c	1
10	Air Dryer	3	44.	PVC -Win Door V corner cleaning M/c	1
11.	Forklifts	5	45.	PVC Profile Sealed Cover Milling M/c	1
12.	Material Lift	2	46.	PVC Win door Corner cleaning M/c	1
13.	Wire Rope Hoist	1	47.	Edge Grinding m/c	1
14.	Bar Code Printing M/c	3	48.	Rotated Sealant spreading Table	1
15.	Lath Machines	4	49.	Vacuum Cleaning M/c	1
16.	Hydraulic Press	1	50.	Hand cutter M/c	1
17.	Screw Polishing M/c	1	51.	Two Head welding M/c for colored PVC	1
18.	Milling M/c	1	52.	Horizontal Insulation glass assemble table	1
19.	Shaper M/c	1	53.	Butyl Sealant Extruder M/c	1
20	Bend Saw (Power hexa) No.01	1	54.	Horizontal glass washing drying M/c	1
21.	Power hexa No.02	1	55.	Belt Grinding M/c	1
22.	Drill M/c	2	56.	Drilling M/c	1
23.	Surface Grinder	1	57.	Circular Saw	1
24.	Welding Machine	2	58.	Wood Cutting M/c No.01	1
25.	Bench Grinder	2	59.	Wood cutting M/c No.02	1
26.	Roll Rewinding Machine	2	60.	Thermocol Cutting M/c	1
27.	Lamination M/c	3	61.	Door Assemble fixer	1
28	Embossing M/c (with hydraulic system)	1	62.	Thermocol Heating M/c	1
29.	Thermofoaming M/c	1	63.	UV Printing M/c	1

30.	Vacuum Press M/c	1		64.	V-Grooving M/c	1
31.	Crafted Machine	1		65.	Slide Table saw M/c	1
32.	CNC Machine	1		66.	Scissor Lift with hydraulic system	1
33.	Spray Printing M/c	1		67.	Sub Station	4
34.	Profile Lamination Machine	1				

2.3.3 Fabrication of WPC Panel Door Shutter and Frame

2.3.3.1 *Material and tools used in fabrication of Solid Panel WPC door;*

i. 5mm PVC Sheet – 8' x 4' – 1 piece

ii. M.S. Square tube – Two types of tubes of 19 gauges of 19mm x 19mm and 15mm x 15mm.

iii. Solvent Cement, Red oxide primer

iv. Circular saw machine and Circular saw cutter, Tube cutting machine, I Hack saw frame, Grinding machine/ Foil, 'V' groove cutter, 8' long Electric heater (which is kept in between two 8' long Wooden or MDF batons), C Clamps and Wooden batons, Electric welding set, Beading marker, G.I. paper clip, Drill machine, Wood planar, Cutter, Right angle, Hammer, Screw driver, Screws, Measuring tape, Thinner and Clean cloth.

Fabrication of MS frame

Solid Panel door is built around M.S. Hollow Square tube frame made out of 19mm x 19mm, 19 gauge square for vertical stiles and 15mm x 15mm 19 gauge square tube is used for top and bottom rails. A good quality 2.5mm electrode is used for welding purpose using electric arc welding machine or using with Fusion heat welding process and two or more coats of red oxide primer is applied to all the sides of the fabricated M.S. frame.

Fabrication of 'C' Channel

For 'C' channel in WPC panel Door, two 'V' grooves on the sheet is created/cut (3 to 3.5 mm deep) using 'V' groove cutting machine. Before bending the 'V' grooved sheet, 20mm wide WPC sheet strip is pasted using solvent cement. The 'V' groove sheet bending process (90^0 angles) is done by using heater, approx. 8' long heater kept in between two MDF/Wooden batons. The 'V' groove sheet is placed on heater in such a way that 'V' groove side sheet faces upwards and the surface of 'V' grooved sheet gets evenly heated on the heater. While the sheet is warming up, solvent cement is poured in between both grooves. After the sheet reaches the required temperature, both the sides of sheet is pressed in the direction of 'V' groove and it is bent & pressed inside until it achieves the right shape. Then, using wet cloth the temperature is normalized & 'C' Channel is given a permanent 90^0 shape. Similarly the other 'V' groove sheet is bent to 90^0. In this way one 'C' Channel for door is ready which is inserted on MS Frame after which panel is inserted.

After fixing M.S. frame with panel and 'C' Channel top rail, bottom rail and lock rail is pasted on the door. Now, the extra portion of 'C' Channel is cut from the top and bottom of door using hack saw blade, and door shutter is ready.

2.3.3.2 *Fabrication of WPC Solid Door Frame*

WPC Door Frames/Chowkhat are fabricated in the factory made of single extruded WPC (Wood Polymer Composite) comprising of virgin PVC polymer with other additives fabricated with miter joints after applying PVC solvent cement and screwed.

Jointing of WPC Solid Door Frame

For jointing WPC solid door frame, the frame in required size of length in meter is cut (45 Deg.) at one end & another length at opposite side of the vertical lengths of frame. For horizontal length, cut both of ends in metre cut (45 Deg.), stick the faces of metre cut ends with instant adhesive like Acracyno Bond or Feviquick Bond, after setting ends of frame, screw the frame horizontal& vertical lengths with each other with self-tapping screws of size 38/8mm, each ends screw with minimum 2 nos. of screws, this completes the jointing of WPC frame.

2.3.4 Advantages of WPC over PVC

The PVC foam boards and the WPC boards have both similarities and differences. Both are composed of plastic (Polyvinyl Chloride- PVC) as a synthetic material, however WPC boards contain wood powder/bamboo flour also.

The variations between the two kinds of boards are present because of the different molecular-level composition of the boards. The WPC boards undergo greater refining and also have the necessary additives to make it more useful even in adverse conditions. The advantages of WPC Boards over PVC boards include;

Linear Extension/Expansion

WPC boards composed of the wooden floor along with plastics & certain additional additives, are more resistant to expansion when heated in comparison to PVC boards. It retains original length and structure even in the presence of heat and warmth for long time intervals.

Ease of Installation and Usage

The wood plastic composite material offers more flexibility and can be easily bent, routed as well as ripped, so as to fit the contours of any space. On the other hand, routing the edges of the PVC board is not easy, and even requires more tools to do any kind of modification.

Appearance and Aesthetics

As the WPC composite boards have wooden powder, it has the real wooden grain sculpt and stamp, and display more natural and authentic colours that are more pleasing to the eyes. The PVC boards exhibit synthetic uniformity, however are generally less attractive. The Composite decking and boards hence improve the aesthetics of any given space.

Resistance to Water and Moisture

Both WPC boards as well as the PVC boards offer excellent resistance to moisture and water. As the WPC boards can also resist temperature changes better, and do not expand or shrink with variations in temperature, it performs better than the PVC boards when used in humid and damp conditions.

Slip Resistance

The wood plastic composite boards offer better slip resistance because of the presence of wood grains as part of its component.

2.3.5 List of Laboratory equipment

S. No.	Name of Equipments	Quantity
	For PVC Sheet Testing	
1	Tensile M/c TKG250 (ASTMD 638) Make Polyplast	1 No.
2	Tensile Specimen (Manual Cutter) ASTMD. Make Polyplast	1 No.
3	Melting Point (Apparatus) Make – Labhosp	1 No.
4	Impact tester Make Polyplast	1 No.
5	Muffle Furnace	1 No.
6	Oven	1 No.
7	Hardness Tester, ASTMD 2240, Din 53505 Make Stech	1 No.
8	Micrometer	1 No.
9	Steel Ball Impact Test	1 No.
10	Precise weighing balance	3 Nos.
11	Measuring Tap	1 No.
12	Digital VerniorCalipers	1 No.
13	Steel Scale	1 No.
14	Digital Density Apparatus by specific gravity Method, Make International Equipment, Mumbai	1 No.
15	Filler Gauge	1 No.
16	Spirit Level	1 No.
17	Dial Guage	1 No.
18	Viscosity Cup (B-4)	1 No.
19	Weighing Balance	2 Nos.
	For PVC Door Testing	
1	Steel Scale	1 No.
2	Steel Ball – 0.5 kg	1 No.
3	Angle Protector	1 No.
4	SquarenessGuage	1 No.
5	Measuring Tap	1 No.
6	Leather Ball – 5 kg	1 No.
7	Sand Bag – 30 Kg	1 No.

2.3.6 Precautions

1. MS Tubes used to fabricate MS frame should be of 18-19 gauge and the tube should be set straight using hammer before they are welded.
2. While welding 19mmX19mm MS tube with 15mm X 15mm MS tubes, it should be ensured that 15mm X 15mm tube is welded in the center of 19mm X19mm MS tube.
3. Sheet grooved for ‘C’ Channel should be around 3.0 - 3.5mm. If the depth of the groove is not proper then while bending, the ‘C’ channels might crack.

4. To insert ‘C’ channel on MS frame, expand the opening of ‘C’ Channel and then insert it on MS frame and if ‘C’ Channel is inserted directly on the frame without expanding then diagonal of the frame might get disturbed.
5. The size of panel should be 5 mm less than the size of MS frame. If the size of panels is equal to the size of MS frame then in future the door may warp.
6. The door should be placed vertically after fixing C channel and panel so that the solvent cement may flow outside. If extra amount of solvent cement resides in the ‘C’ Channel it may distort the shape of ‘C’ Channel.
7. While pasting rails on the door 15mm thick sheet or support should be kept behind the door so that the rail can properly be stuck on the door. While applying pressure on the door, rails must not shift to one side of door.
8. While fabricating door a big piece of card-board should be placed to avoid possible scratches.
9. The solvent cement should be carefully used as required. Excess usage of adhesive may make marks on the door.
10. Adequate care should be taken that joints of C Channel and Panel are properly affixed. If it is not fixed properly then solvent cement should be applied again to fix the joints. Clean the door using thinner and cloth and then wipe the door with dry and clean cloth.
11. If some scratches appear on the door, then heat that portion by hot air gun due to which that portion gets expanded and the scratch fades out.
12. If different sizes of doors are kept on the horizontal platform then the total no of doors should not exceed 12 nos. If the doors exceed 12 No’s then in the bottom a 5 mm thick ply board sheet should be placed so as to preserve the door from warping.
13. It is difficult to install new hardware like locks for doors since the brittle vinyl can crack easily. Once the shutter shows crack or other signs of damage, it is very difficult to repair it.
14. The lightweight character of WPC doors can sometimes inhibit its strength. This can affect the security aspects of exterior doors.

2.3.7 Inspections & Testing

Inspections & testing shall be done at appropriate stages of manufacturing process. The inspected panels shall be stored & packed to ensure that no damage occurs during transportation. As part of quality assurance, regular in-process inspections shall be carried out by the trained personnel of the PAC holder.

2.3.8 Storage & handling at the user end before installation

Storage- At the user’s end the shutter shall be stored / stacked one over the other to a maximum height of 1200 mm in order of the sizes with the largest at the bottom. They shall be stacked flat on bearer strips properly covered to exclude moisture and kept inside a shed / building.

Handling – WPC Panel Door shall be handled carefully during storage or installation in order to prevent occurrence of damages to the faces & edges. The shutters shall not be dragged along a stack or any surface but shall be lifted clear of a stack or any surface on which they are stored.

2.4 Maintenance

No maintenance is practically required for these door shutters, however, it shall be installed strictly as per the instructions contained in the technical literature.

This type of door shutters especially those in exposed & wet locations i.e. bathroom & toilet, shall be refinished in accordance with the recommendations contained in technical literature of the manufacturer.

2.5 Skills /Training needed for installation

No special skills other than the normal skills of a good carpenter are needed for installing the shutters.

2.6 Guarantee/Warrantee provided by the PAC Holder

This product is guaranteed for a period of two year from the date of supply against any genuine manufacturing defect provided the products are not subject to any damage whatsoever and are not abused/misused or wrongly installed. During the period of Warranty the products shall be serviced free of cost for any defect observed and subsequent to Warranty period services shall be done at a nominal service charges together with other incidental costs as mutually agreed by the PAC holder and the purchaser.

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 shutters. Users / Customers shall ascertain from the PAC holder the type of services and the conditions, the PAC holder is prepared to provide.

2.8 Responsibility

- Specific design using WPC Panel Door with frame is the responsibility of the designer with the instructions, supervision and guidance of the PAC holder.
- Quality of installation/construction of the product on site is the responsibility of the trade persons engaged by the building owner under the guidance of the manufacturer.
- The maintenance of the product is the responsibility of the building owner as per the guidance of the manufacturer.

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 Tests Performed

Assessment of the suitability of the WPC Door and Frame is based on:

3.2.1 Test Conducted for Hardness of WPC Profile (Door Frame)

Name of Laboratory	CIPET, Centre for Skilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail	75 x 50 mm WPC Profile (Door Frame), 2 Pcs
Test Duration	29.10.2021 to 01.11.2021

S. No.	Name of Test	Test Value	Test Method
1	Hardness (Shore – D)	73	ASTM D2240 : 2015

3.2.2 Test Conducted for Physical Properties of WPC Profile (Door Frame)

Name of Laboratory	CIPET, Centre for Shilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail	90 x 45 mm WPC Profile (Door Frame) 125 x 65 mm WPC Profile (Door Frame) 75 x 50 mm WPC Profile (Door Frame)
Test Duration	27.09.2021 to 25.10.2021

S. No.	Name of Test	Test Value	Test Method
Sample : 75 x 50 mm WPC Profile (Door Frame)			
1.	Density	0.863 gm/ cm^3	IS 13360 Pt. 3 / Sec-1
2.	Water Absorption	0.42 %	ASTM D570
3.	Screw withdrawal Strength		
	On Surface	3013.60 N	IS 4020 : 98 Part-16
	On Edge	2795.60 N	
Sample : 125 x 65 mm WPC Profile (Door Frame)			
1.	Density	0.861 gm/ cm^3	IS 13360 Pt. 3 / Sec-1
2.	Water Absorption	0.46 %	ASTM D570
3.	Screw withdrawal Strength		
4.	On Surface	2765.80 N	IS 4020 : 98 Part-16
5.	On Edge	2435.60 N	
Sample : 75 x 50 mm WPC Profile (Door Frame)			
1.	Density	0.814 gm/ cm^3	IS 13360 Pt. 3 /

			Sec-1
2.	Water Absorption	0.44 %	ASTM D570
3.	Screw withdrawal Strength		
4.	On Surface	2635.70 N	IS 4020 : 98 Part-16
5.	On Edge	2230.80 N	

3.2.3 Test Conducted for Physical & Chemical Properties of WPC Profile (Door Frame)

Name of Laboratory — CIPET, Centre for Skilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail — 100 x 50 mm WPC Profile (Door Frame), 2 Pcs
Test Duration — 30.12.2019 to 17.02.2020

S. No.	Name of Test	Test Value	Test Method
1.	Water Absorption	0.43 %	ASTM D570
2.	Compressive Strength	60.42 N/mm^2	ASTM D695
3.	Density	0.89gm/cm^3	IS 13360 Pt. 3/ Sec-I
4.	Screw withdrawal Strength		
	On Surface	2860 N	IS 15931
	On Edge	1930 N	
5.	Elastic Modulus	1328.59 N/mm^2	ASTM D790
6.	Flammability	V_o	UL-94
7.	Resistance to Spread of Flame	Self-Extinguishing	Spec. No. C-8049 (Appendix – 1)

3.2.4 Test Conducted for Physical & Chemical Properties of WPC Profile (Door Frame)

Name of Laboratory — CIPET, Centre for Skilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail — 125 x 50 mm WPC Profile (Door Frame), 2 Pcs
Test Duration — 30.12.2019 to 17.02.2020

S. No.	Name of Test	Test Value	Test Method
1.	Water Absorption	0.60 %	ASTM D570
2.	Compressive Strength	59.46 N/mm^2	ASTM D695
3.	Density	0.85gm/cm^3	IS 13360 Pt. 3/ Sec-I
4.	Screw withdrawal Strength		
	On Surface	3666 N	IS 15931
	On Edge	2918 N	
5.	Elastic Modulus	1336.39 N/mm^2	ASTM D790
6.	Flammability	V_o	UL-94
7.	Resistance to Spread of Flame	Self-Extinguishing	Spec. No. C-8049 (Appendix – 1)

3.2.5 Test Conducted for Physical Properties of Solid WPC Flush Door Shutter

Name of Laboratory — National Test House, Mumbai.
Sample Detail — 28 mm thick Solid WPC Flush Door Shutter
Test Duration — 10.12.2019 to 30.12.2019

S. No.	Tests	Result Obtained	Requirements of IS : 15931 : 2012
1	Dimensions &Squareness test (As per IS : 4020 (Pt-2)-98), in mm		
	a) Average Height	2160 mm	--
	b) Average Width	770 mm	---
	c) Thickness	28.2 mm	…
	d)Maximum variation in thickness between 2 points, mm	0.2 mm	Not more than 0.8
2	General flatness, in mm		
	a) Warping	0.2	Not more than 2mm
	b) Cupping	0.1	Not more than 2mm
	c) Twist	0.4	Not more than 2mm
3	Impact indentation test (As per IS : 4020 (Pt-5)-1998)		
	a)Appearance : Cracking and tearing was observed	Satisfactory	Shall be satisfactory
	b) Max. Depth of depression, mm	0.08	Not more than 0.3 mm
4	Edge loading test (As per IS : 4020 (Pt-7)-1998 in mm		
	a) Deflection after 15 minutes in mm under load application	2.52	Not more than 8mm
	b) Residual deflection	0.12	Not more than 0.7 mm
5	Shock Resistance test (As per IS : 4020 (Pt-8)-1998) Soft and light body impact test Observations for any visible damage after 25 blows on each side	Satisfactory	Shall be Satisfactory
6	Buckling Resistance Test (As per IS : 4020 (Pt-9)-1998)		
	a) Appearance- Observation for deterioration	No Deterioration	Shall be no Deterioration
	b) Residual deflection, 30 min after removal of load, in mm	3	Not more than 5mm
7	Misuse test (As per IS : 4020 (Pt-11)-1998) Observed for any permanent deformation affecting normal usage	Satisfactory	Shall be Satisfactory
8	Slamming test (AS per IS : 4020	No damage	Shall be no damage

	(Pt-10)-1998)		
9	Workman Ship and Finish Free from any defect like improper finishing and surface defects	Satisfactory	Shall be satisfactory
10	Screw Withdrawal Resistance Test) as per IS: 4020)pt-16) 1998		
	(i) Face Direction	1773 N	Not less than1000 N
	(ii) Edge Direction	1592 N	Not less than1000 N

3.2.6 Test Conducted for Physical & Chemical Properties of WPC Profile (Door Frame)

Name of Laboratory — CIPET, Centre for Skilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail — 125 x 80 mm WPC Profile (Door Frame), 2 Pcs
Test Duration — 30.12.2019 to 17.02.2020

S. No.	Name of Test	Test Value	Test Method
1.	Water Absorption	0.47 %	ASTM D570
2.	Compressive Strength	64.41 N/mm^2	ASTM D695
3.	Density	0.88gm/cm^3	IS 13360 Pt. 3/ Sec-I
4.	Screw withdrawal Strength		
	On Surface	2939 N	IS 15931
	On Edge	1728 N	
5.	Elastic Modulus	1277.04 N/mm^2	ASTM D790
6.	Flammability	V_o	UL-94
7.	Resistance to Spread of Flame	Self-Extinguishing	Spec. No. C-8049 (Appendix – 1)

3.2.7 Test Conducted for Physical & Chemical Properties of WPC Sheet

Name of Laboratory — CIPET, Centre for Skilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail — 25mm WPC Sheet, 4 Pcs
Test Duration — 24.10.2019 to 05.12.2019

S. No.	Name of Test	Test Value	Test Method
1.	Water Absorption	0.44 %	ASTM D570
2.	Compressive Strength	57.60 N/mm^2	ASTM D695
3.	Density	0.656gm/cm^3	IS 13360 Pt. 3/ Sec-I
4.	Screw withdrawal Strength		
	On Surface	1981.12 N	IS 15931
	On Edge	1476.32 N	
5.	Elastic Modulus	1530.91 N/mm^2	ASTM D790
6.	Flammability	V_o	UL-94
7.	Resistance to Spread of Flame	Self-Extinguishing	Spec. No. C-8049 (Appendix – 1)

3.2.8 Test Conducted for Physical & Chemical Properties of WPC Sheet

Name of Laboratory	CIPET, Centre for Skilling and Technical Support (CSTS), Bhopal (MP).
Sample Detail	18mm WPC Sheet, 4 Pcs
Test Duration	24.10.2019 to 05.12.2019

S. No.	Name of Test	Test Value	Test Method
1.	Water Absorption	0.23 %	ASTM D570
2.	Compressive Strength	71.22 N/mm^2	ASTM D695
3.	Density	0.68 gm/cm^3	IS 13360 Pt. 3/ Sec-I
4.	Screw withdrawal Strength		
	On Surface	2036.8 N	IS 15931
	On Edge	1703.2 N	
5.	Elastic Modulus	1300.6 N/mm^2	ASTM D790
6.	Flammability	V_o	UL-94
7.	Resistance to Spread of Flame	Self-Extinguishing	Spec. No. C-8049 (Appendix – 1)

Quality Assurance system followed by the certificate holder

Assessment of quality assurance procedures implemented for process control & final product as per Quality Assurance Plan**.**

3.3 Site Inspection (Manufacturing Plant Visit)

The manufacturing unit was inspected by the members of TAC & Officers of the Council via video conferencing in prevailing scenario of Covid -19. The firm has got necessary manufacturing and test facilities to produce the components as per the required design, specifications & quality. The manpower was found to be conversant with manufacturing process & testing procedures required for the quality control of the system.

3.4 Major supply of the WPC Door and Frame

The manufacturer has supplied the WPC Door and Frame as per the details given below;

S.No.	Name of Party	City	Product	Design	Qty
1.	JMC Projects (India) Limited	Vijaywada	WPC Frame	Frame - Plain,	160
2.	JMC Projects (India) Limited	Vijaywada	WPC Door	UV Printed SS	
3.	JMC Projects (India) Limited	Vijaywada	WPC Window	UV Printed	157

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: 29/03/2022

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

Dr. Shailesh 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

Part 5 List of Standards & Codes used in Assessment

5.1 Standard of Raw Materials:

All raw materials definition given in standards IS 2828 and IS10428 and the following shall apply;

- Virgin Material – Materials in such form as granules or powder that has not been subjected to use or processing other than that required for its manufacture and to which no reprocessed or recycled material has been added.
- Additives – Any material introduced prior to the final consolidation of rigid PVC foam sheets to increase bonding or to improve some property of the final rigid PVC foam sheet. Fillers and preservatives are included in this.
- Blowing Agents – Blowing agent is a kind of additive used for producing pores or cells throughout the polymer mass
- Thermal Conductivity – It is the quantity of heat in the steady state condition lowing in unit time through a unit area of a slab of uniform material of infinite extent and of unit thickness, when unit difference of temperature is established between its face.
- Warp – It is the dimensional distortion in a plastic material after moulding or other fabrication.
- Type Tests– Tests carried out whenever a change is made in the composition of the material or in the size in order to establish the suitability of the lot.
- Visual Appearance - The Sheet shall be smooth, clean and free from other hidden Internal defects such as air bubbles, pin holes, pits and other foreign inclusion. Slight longitudinal extrusion lines which may be visible but not discernable when felt by hand shall be permissible

5.2 List of IS standards and Codes

- Density - In accordance with IS 13360 (Part 3/ Sec 1), the density of sheet shall be 0.55 to 0.65 g/cm^3
- Heat Reversion -Tested by subjection to a temperature of 70 ± 2^{0}C for 7 days as prescribed in IS 11239 (Part 3), a sheet of 200 ± 20 mm long shall not alter in length by more than 2 percent.
- Impact Strength - Tested by the method prescribed in IS 13360 (Part 5/Sec 5), the sheet shall have no defect such as cracking, tearing or delaminating. The depth of indentation shall be less than 0.3 mm
- Tensile Strength - In accordance with the procedure given in IS 8543 (Part 5/Sec 1), the tensile strength of sheet shall not be less than 10N/mm^2
- Flexural Strength - Tested in accordance with the procedure given in IS 13360 (Part 5 / Sec 7), the flexural strength of sheet shall not be less than 20N/mm^2
- Screw Withdrawal Strength - In accordance with the procedure given in IS 4020 (Part 16), the screw holding capacity shall not be less than 1500 N across the face and 1250 N across the edge across the face and 1250 N across the edge
- Thermal Conductivity -Tested in accordance with the procedure given in IS 3346 (Part 5 / Sec 7), the thermal conductivity of WPC sheet shall not be less than 0.07kcal/h/m/.C
- Mild Steel Frame – Mild Steel tube for frame shall meet the requirements in IS 4923. Mild Steel tubes shall be of size 15mm x 15mm for top and bottom rails and 19mm x 19mm for stiles.
- Adhesive – Solvent Cement used for jointing of panel, stile and rails shall conform to the adhesive properties specified in IS 14182

CERTIFICATION

In the opinion of Building Materials & Technology Promotion Council's Board of Agreement (BMBA), **WPC Door Shutter and WPC Frame** bearing the mark manufactured by M/s Rajshri Production (P) Ltd. is satisfactory if used as set out above in the text of the Certificate. This Certificate **PAC No. 1062-C/2022** is awarded to **M/s Rajshri Plastiwood (Division of M/s Rajshri Production (P) Ltd.).**

The period of validity of this Certificate is for a period of one year i.e. from **29.03.2023 to 28.03.2024** as shown on Page 1 of this PAC. This Certificate consists of pages 1 to 34.

Dr. Shailesh 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

Embossing Seal of BMBA

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: 21-12-23

Part 6 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 Affairs 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 years 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 Affairs 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 I

Quality Assurance Plan

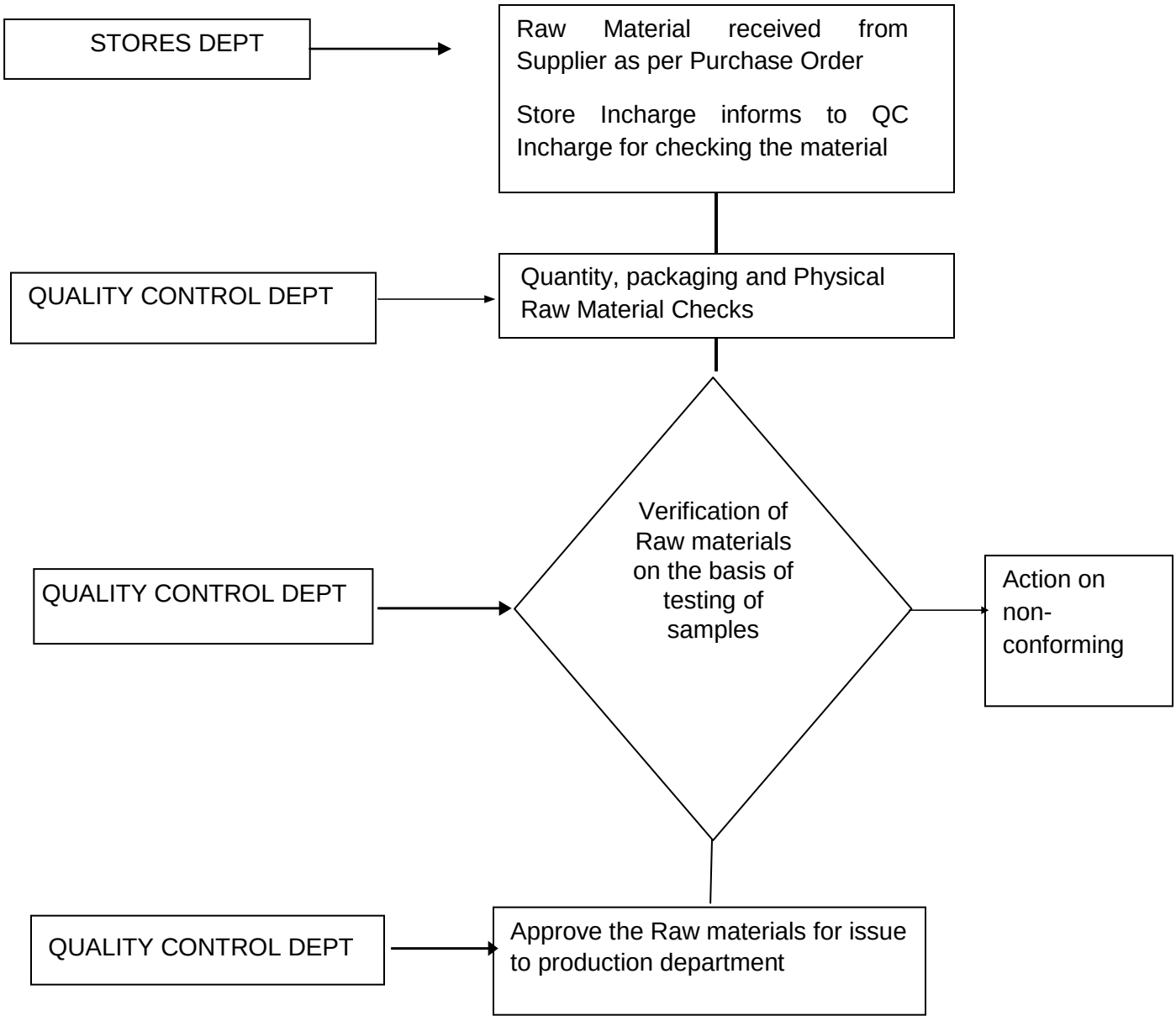
WPC materials and WPC Products

1	Description	This unit is about carrying out quality assurance of WPC materials and WPC products (materials procured, compound, manufactured, inspected, packed and tested)
2	Scope	This unit/task covers the following: • Ensure housekeeping and safety in the working area • Equipment preparation and calibration of instruments to be used in the quality resting process • Collect samples • Carry out tests as per laid down method • Analysis, interpretation, judgment and reporting • Record Keeping
3	Element	Performance Criteria
4	Sample Collection	To be competent, the user/individual on the job must be able to : 4.1 Draw sample of the material from the lot to be tested as per standard Procedure 4.2 Sampling should be as per the guidelines 4.3 Identify the sample by labeling/numbering
	Equipment readiness	4.4 Identify the most appropriate equipment for testing 4.5 Calibrate /verify/validate the testing equipment 4.6 Identify defective equipment/apparatus and corrective steps to be taken
	Quality Assurance	4.7 Carry out testing of WPC products as per the standards 4.8 Follow statistical quality control procedures 4.9 Work according to laboratory procedures, standards and testing procedures 4.10 Check product parameters through on line and off line test procedures 4.11 Communicate tag for the batch marking to the downstream team and upstream teams. 4.12 Carry out Inspection and packing controls and procedures 4.13 Confirm product dimensions and weight controls 4.14 Ensure that the material is not altered in any way during checking 4.15 Record dimensions in check sheet 4.16. Carry out Q C audit and quality procedures. 4.17 Per shipment inspection and lot release 4.18 Comparison of the vendor supplied product specifications with standards for accept/reject criteria upon lab testing 4.19 GMP (Goods manufacturing practice) and other quality standards / procedure observances
	Recording and Reporting	4.20 Record and maintain data as per Company standards 4.21 Ensure that reports/records are accurate and clear 4.22 Release or Hold the material as per finding for further processing. 4.23 Take up the results of the findings with supplier/QA in-

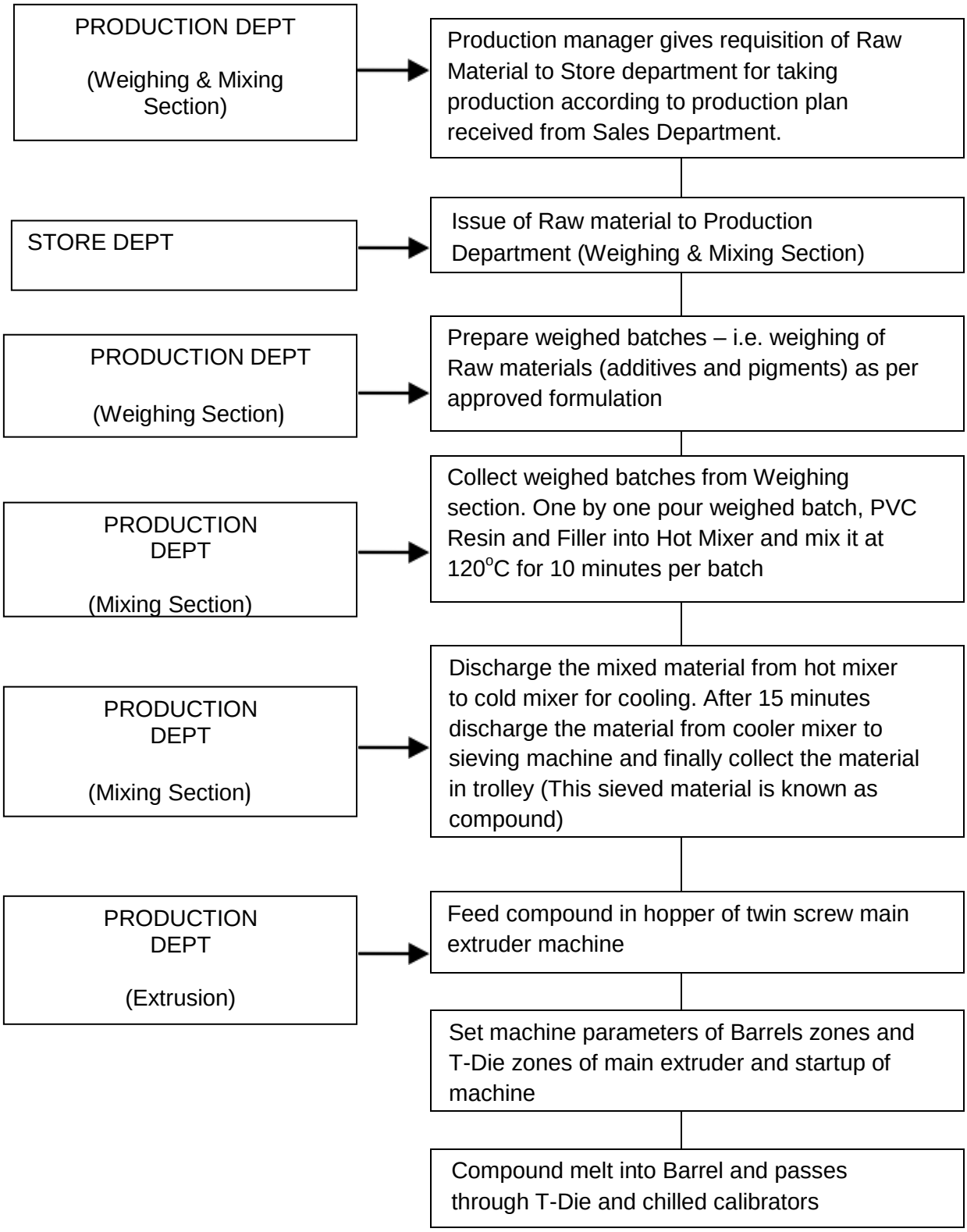
		charge/appropriate Authority 4.24 Inform concerned persons for rectifications, if needed in specified time limit
	Health & Safety	4.25 Handle the equipment's and samples properly 4.26 Conduct the quality checks wearing the appropriate attire and safety gears 4.27 Precaution for dust / chemical inhaling and handling 4.28 Comply with health, safety, environment guidelines, regulations etc in accordance with organizational standards
	Material Disposal	4.29 Dispose all materials used in the QA test safely as per Health and Safety management system of the company
5	Knowledge and understanding	
	Organizational Context (Knowledge of the Company/Organization and its process)	The user/individual on the job needs to know and understand: 5.1 Company's quality policies and acceptance standards for raw materials, processed and final products 5.2 Organizational Coding system of raw material, compounds and products 5.3 Chemicals and packing material used in the industry and their function 5.4 Different quality management systems 5.5 Principles of good quality assurance practices applicable in the workplace 5.6 Material disposal procedure, importance of appropriate disposal of material and Implications of not following the material disposal Procedure. 5.7 Importance of quality and damage checks 5.8 Importance of identifying non-conforming products 5.9 Risk and impact of not following defined procedures/work instructions 5.10 Types of documentation in organization and importance of the same 5.11 Records to be maintained and implications of non-maintenance of the same 5.12 Company manual and from where to attain it 5.13 Importance of housekeeping & good shop floor practices 5.14 Health, Safety and Environment guidelines, legislation and regulations as Applicable 5.15 Personal protection (Which protective equipment to be used and how) 5.16 Impact of poor practices on health, safety and environment 5.17 Potential hazards and actions to minimize the same 5.18 Escalation matrix and escalation procedure for reporting hazards. 5.19 Impact of various practices on cost, quality, productivity, delivery and safety
6	Technical Knowledge	The user/individual on the job needs to know and understand: 6.1 Knowledge on different standard reference material for

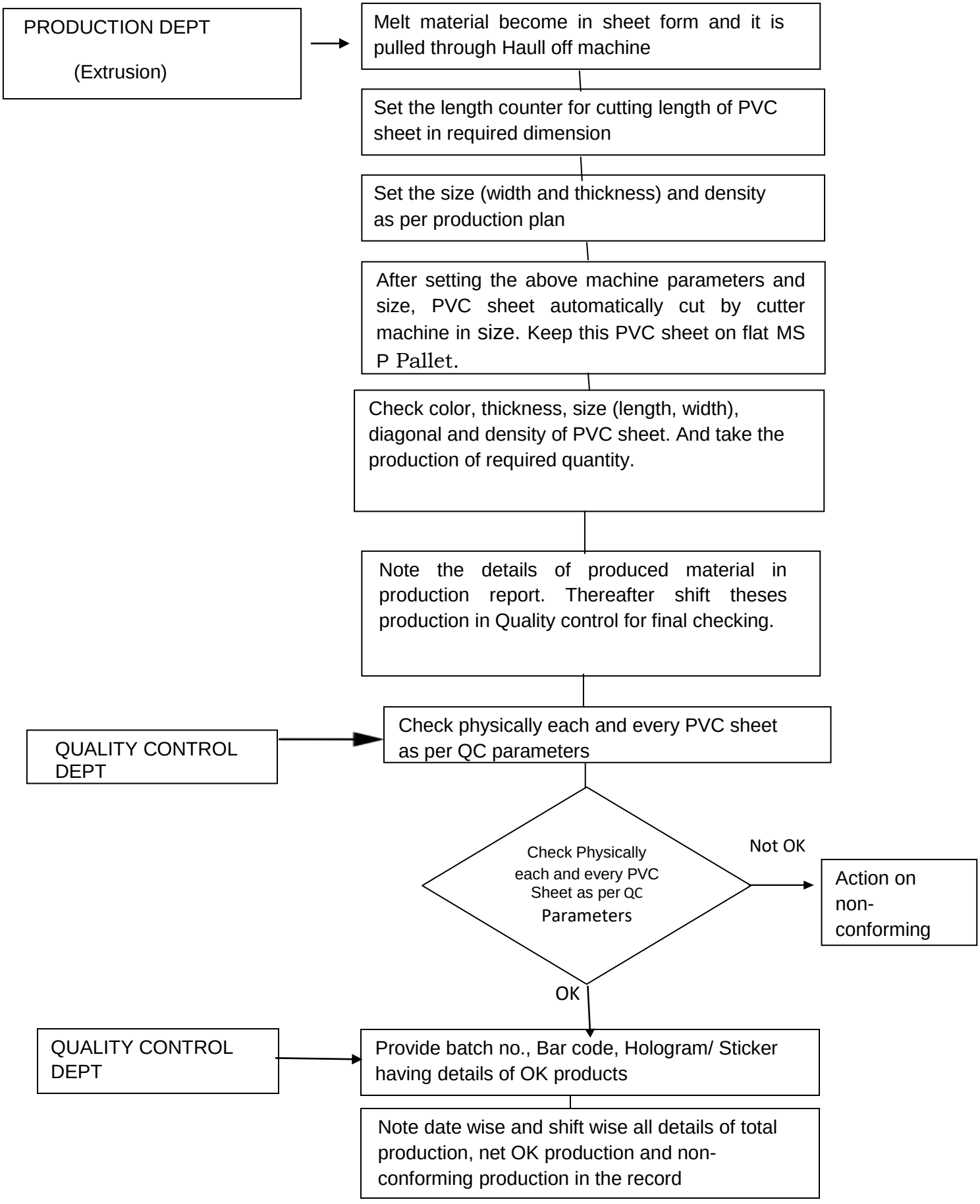
		quality control 6.2 Awareness of Shelf life procedures, both accelerated and real time ageing methods 6.3 On line and off line sampling procedures for product quality analysis and audit 6.4 Labor training procedures for each job applications. 6.5 Product complaint handlings and its analyses. 6.6 Role of different raw materials in WPC Compounding, processing/ product manufacturing and performance. 6.7 Use of computer and application software. 6.8 Knowledge of latest products manufacturing machine, testing, inspection, packing Machines and its operation. 6.9 Knowledge of lab equipment and its handing 6.10 Specification of material tested and its importance in the release system 6.11 National/international standard quality test methods for different material and Finished products. 6.12 Knowledge of lab chemicals and preparations 6.13 Methods/techniques used for labeling samples 6.14 Statistical analysis of test data. 6.15 Implication (internal and external customer) of defective product, material and component 6.16 How to obtain and interpret records, charts, specifications, equipment manuals, history/technical support reports and other documents 6.17 Methods and techniques involved in evaluating information 6.18 Importance of proper record maintenance.
7.	Generic Skills	7.1 Communication with upstream and downstream teams 7.2 Work in a team and other behavioral skills required to support the small group Activities (Eg. Quality Circle, Cross Functional Team, Suggestion Scheme) 7.3 Disclose information only to those who have the right and need to know it. 7.4 Communicate confidential and sensitive information discretely to authorized Person. 7.5 Practice honesty with respect to company property and time 7.6 Communicate with people in a form and manner and using language that is open and respectful. 7.7 Take responsibility for completing one's own work assignment 7.8 Take initiative to enhance/learn skills in one's area of work 7.9 Avoid absenteeism 7.10 Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations 7.11 Work in disciplined lab environment 7.12 Be punctual

Raw Material Process Flow Chart (RP-PF-01) **Annexure II**



Procedure of Products (RP-PF-02)




PRODUCTION DEPT
(Extrusion)
Melt material become in sheet form and it is pulled through Haull off machine
Set the length counter for cutting length of PVC sheet in required dimension
Set the size (width and thickness) and density as per production plan
After setting the above machine parameters and size, PVC sheet automatically cut by cutter machine in size. Keep this PVC sheet on flat MS P Pallet.
Check color, thickness, size (length, width), diagonal and density of PVC sheet. And take the production of required quantity.
Note the details of produced material in production report. Thereafter shift theses production in Quality control for final checking.
QUALITY CONTROL DEPT
Check physically each and every PVC sheet as per QC parameters
Check Physically each and every PVC Sheet as per QC Parameters
Not OK
Action on non-conforming
OK
QUALITY CONTROL DEPT
Provide batch no., Bar code, Hologram/ Sticker having details of OK products
Note date wise and shift wise all details of total production, net OK production and non-conforming production in the record