

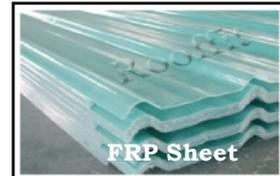


Innovative... Fiberglass, Polycarbonate & Metal Roofing Solutions

- ◆ Index
- ◆ About Us
- ◆ Product Catalog
- ◆ Quality Policy & Objectives

Industrial Roofing Products Range

1. FRP Skylight **Machine-Made** Roofing Sheets – Any Profile & Length (As Per IS -12866, CPWD (DSR-2007) & Railways - SOR)
2. FRP Translucent Roofing Sheets – Hand Molded (As Per IS - 12866)
3. FRP Industrial Roof Rain Water Gutter (SOR - Railways)
4. Wind Driven Roof Turboventilators
5. FRP Chemical Resistant Sheets & Chemical Lining
6. Polycarbonate Sheets – Compact, Embossed, Multi Wall – Any Profile
7. Metal Roofing Sheets - PPGI, PPGL & Bare Galvalume Steel Sheets (SOR - Railways)
8. FRP Gratings, FRP Ladders, FRP Cable Trays
9. Insulated Roofing Composite Panels

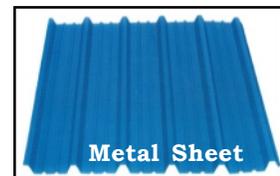


Building Products Range

1. FRP Doors & Frames (IS - 14856, CPWD, SOR - Railways)
2. PVC Doors & Frames (CPWD, SOR - Railways)
3. FRP Chajja (CPWD, SOR - Railways)

Other Credentials & Approvals

1. Client List
2. Vendor Approvals
3. Test Reports
4. ISO - 9001 Certificate
5. DGMAP E-in-C's Branch, Army HQ - Defence
6. HQ Chief Engineer Chennai Zone - Military Engineer Services



Reference IS Code

1. IS -12866 — FRP Sheet
2. IS - 14856 — FRP Door

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ABOUT US

‘Shiv Shakti Fibre Udyog’ is Thankful to our esteemed and valuable clients to have provided us with the ever-growing opportunity to serve them for the last 15 Years under our brand of repute “Rooffit” and has an International reputation as the manufacturer and supplier of high quality complete Roofing Products utilizing best of the technology. The company is an amalgamation of enterprising management graduates and technocrats working together with the prime objective of providing Very High Quality Roofing products at competitive prices.

“Rooffit” with its State Of Art Technology provides World’s best complete Roofing & Building Solution in concept, design, manufacture, supply & installation of profiled FRP & Polycarbonate Skylight Roofing Sheets, Turbo Ventilators, Ridge Ventilators, FRP Gutters, FRP Gratings, Metal Roofing & Wall Cladding Sheets, ‘Z’ & ‘C’ Purlin System, Steel Decking Sheets, FRP Doors & Frames, Insulation alongwith complete accessories under one roof.

We have always trusted upon following three principals, which have enabled us to be on the priority list of our clients those are:

First, versatility in our company and products

Second, Our ability and reputation of meeting tight deadlines while still maintaining high standards and quality norms.

Third, the confidence and compatibility we have with our clients, which we try to maintain forever.

Quality Assurance: Maintaining high quality products are the First commitment of the company towards its valued customers. We at “Rooffit” has well established quality assurance department to ensure the conformity of the products to the relevant technical and international standard. The well equipped in-house testing laboratory is utilized to perform raw material and product testing. Tests are also conducted by authorized and international third party if required by our valued customer.

Vision: To be the World’s premiere and competitive Turnkey Solution Provider for all types of Buildings Sheet Roofing Systems.

Mission: To deliver high quality Sheet Roofing Products in Metal & Fiberglass for Buildings & Structural Systems in the World with the highest Standard to the complete satisfaction of the customer.

QUALITY POLICY

We at '**SHIV SHAKTI FIBRE UDYOG**' are committed to deliver high quality fiberglass products, at competitive price. Our Quality Policy starts and ends with the customer as a focal point: understanding the customer's requirements, designing optimal solutions to meet those requirements, building systems and processes in place to ensure quality at every stage, and achieving our commitments on delivery and service through skilled & motivated workforce.

QUALITY OBJECTIVES

- a) **On-time deliveries** – We strive to continually improve customer on-time deliveries, as measured through reschedule reports and customer complaints.
- b) **Long-term employment** – We strive to maintain long-term employees as determined by turnover.
- c) **Satisfaction** – We strive to continually review and improve our quality systems through the use of customer surveys, internal audits and management reviews.
- d) **Opportunities** - We strive to continually improve opportunities for growth for employees.
- e) **Non-conformances** – We strive to continually decrease any non-conformances in products, performance, or systems, through the use of non-conforming product reports as monitored at each Management Review.

INDUSTRIAL ROOFING PRODUCT RANGE

CONTINUOUS MACHINE MADE FIBERGLASS REINFORCED PLASTICS (FRP) TRANSLUCENT ROOFING SHEET AS PER IS-12866

Nomenclature

Supply of “**Rooffit**” brand Machine Made Fiberglass Reinforced Plastics (FRP) translucent Roofing sheets U/V Stabilized in desired thickness, profile (Plain, corrugated, trapezoidal) & color manufactured by “**Shiv Shakti Fibre Udyog**” an **ISO-9001 Certified Company** made as per IS-12866 on continuous machine auto controlled production line with auto batching, bubble free mixer, impregnation, heating, retractor system using continuous glass fiber reinforced material powder grade as per IS: 11551 & sheet grade unsaturated polyester resin as per IS: 6746 and MMA (Methyl Methane Acrylate) for extra clarity, ensuring uniform thickness, Non-Glaring excellent light transmission or color gel-coated opaque sheets as per specification, drawing or direction of Engineer-in-Charge.

The Process

“**Rooffit**” Machine made FRP Sheets is produced in the most advanced state-of-the-art continuous production line specially for manufacturing high transparency sheets in various profile.

The production process deployed in the manufacture of continuous machine made FRP Sheets involves the following steps: -

- ◆ Auto Batching System
- ◆ Bubble Free Mixer
- ◆ Auto Impregnation System
- ◆ Auto Thickness Controller
- ◆ Auto Control Heating System
- ◆ Retractor
- ◆ Dust Free Cutter
- ◆ Static Eliminator
- ◆ Film Unreeling Machine (Optional)
- ◆ Inspection (Quality Control)
- ◆ Packing (Ready for Dispatch).

Range of FRP Roofing Sheets

- ◆ Trapezoidal sheet-Any profile
- ◆ Corrugated sheets matching to GI/Asbestos profile
- ◆ Clip-on-profile
- ◆ Standing seamless profile
- ◆ Louvers
- ◆ Any Customized profile
- ◆ Plain Sheets
- ◆ Continues gutter upto 200mm height
- ◆ Chemical resistant sheets with special protective coating in plain /profile.

Note: Above sheets are available in translucent & gelcoated opaque in any colour of your choice and available in 0.6 mm to 4 mm thickness.

Features

- Length : Any transportable length of 40 feet or more
 Width : Max 1500 mm Plain width
 Thickness : 0.6 mm to 4.0 mm
 (Note: - uniform thickness through out unlike hand made sheets)
 Light Transmission : 80-85% max (Bubble Free)
 Colour : Any translucent or opaque colours.
 Other Products : Machine Made FRP Louvers, Colour Gel Coated Chemical Resistant Sheet
 From the machine : Rain Water Gutters, Flashing and Corner
Output: - 400-450 running metres per hour.

AS PER IS-12866 Standard

PRODUCT INCORPORATION - INDIAN RAILWAYS UNIFIED SOR - 2010
 CPWD DSR - 2007

Applications

- ◆ Industrial Roofing
- ◆ North Light Glazing
- ◆ Skylights – Industrial / Domestic
- ◆ Parking Areas
- ◆ Walk Ways
- ◆ Chemical Plants – Roofing / partition /side cladding /paneling
- ◆ Garages / Verandah /Porches
- ◆ Stadium / Swimming Pool/ Railway Station
- ◆ Window Glazing
- ◆ Side wall cladding
- ◆ Green House

Quality Assurance

Maintaining high quality products is the first commitment of the company towards its valued customers. We at **‘Rooffit’** has well established quality assurance department to ensure the conformity of the products to the relevant technical and international standard. The well equipped in-house testing laboratory is utilized to perform raw material and product testing, test are also conducted by local and international third party independent laboratories for certification and our efforts is to provide quality products with best after sales services.

Advantages of FRP Sheet

“Rooffit” series of FRP Sheets offers an unique blend of advantages which are also guaranteed by ensuring that all material in process to finished goods are taken through a series of required tests as per IS-12866 in our complete in-house testing laboratory that is equipped with all the latest quality assurance equipment.

ADVANTAGES OF MACHINE-MADE FRP ROOFING SHEET

1. Uniform thickness, color, profile & any transportable length.
2. Anti-ageing U/V Resistant film can only be provided in Machine-Made FRP Roofing Sheets which enhances the life of Sheet and can give 15-20 years warranty.
3. Flexibility in Sizes and Thickness: FRP Sheets are custom made sheets and can be made in various sizes, thickness and designs.
4. Matching Profiles: FRP Sheets can be made in any matching profiles as required by the customer.
5. Durability:FRP Sheets have very long life, as these are tough and flexible.
6. Weather Resistant: FRP Sheets are resistant to extremes of weather, as these are waterproof, termite proof, and Acid proof.
7. Provides Day Light:FRP Sheets are translucent and hence provide essential daylight in long industrial sheds.
8. Saves Electricity and Reduce Electricity Bills: FRP Sheets are used for natural day light in long industrial sheds and provides day light for day work and reduces electricity consumption.
9. No Wastage: As FRP sheets can be made custom made sizes there is no wastage.
- 10.Translucent: FRP Sheets are translucent and hence does not allow direct sunlight. However it diffuses light and gives more brightness.
- 11.Freedom in Colour & Design: FRP Sheets can be made in any colour and in various designs.
- 12.Fire Retardant: FRP Sheets can be made fire retardant if asked by the customer.
- 13.Unbreakable: FRP Sheets are crash proof and unbreakable.
- 14.Light Weight: FRP Sheets are light in weight when compared with weight to strength ratio.
- 15.Easy to maintain: FRP sheets are easy to install, maintain & repair.
- 16.FRP Sheets have good thermal & electrical properties.
- 17.Dimension Stability: FRP Sheets have good dimension stability at high temperature.
- 18.High Impact Strength: Resists very high impact strength, which is evident by its application in various fields of automobiles, railways, boats, aircrafts and defense etc.
- 19.Glossy Finish: FRP Sheets can be made in single piece with both side smooth glossy finish and shining surface.
- 20.No. Fadedness in Colour: FRP Sheets are U/V Stabilized hence no or less effect on colors.
- 21.Provision for Fitting: FRP Sheets have complete provision for fittings and fixtures.
- 22.Design Versatility.

TECHNICAL NOTE ON FRP TRANSLUCENT ROOFING & CLADDING SHEETS

We are pleased to introduce ourselves as the leading manufacturers of high quality “**Rooffit**” brand FRP Roofing and Cladding Sheets. The above sheets are manufactured as per **IS-12866**.

We at ‘**Shiv Shakti Fibre Udyog**’ are committed to manufacture and deliver high standard quality FRP Products at low cost to the customer.

Brief Introduction about FRP

FRP is a wonder composite material consisting of fiberglass reinforcement in a matrix of unsaturated polyester resin and outer protective coating with u/v stabilized in built color of your choice having exceptional strength to weight ratio. FRP is generally known for its high strength and resistance to high temperatures, chemicals, bacteria or termite and excellent acoustic insulation. Because of these outstanding properties unlike PVC or Wood, it finds its application widely in all spheres of life – Aerospace, railways, chemical industry, marine industry, food industry, automobile industry, building and construction etc.

FRP Sheets

FRP Sheets are single moulded continuous sheets with both side smooth, glossy finish with inbuilt colour of your choice, which are duly ‘UV’ Stabilized for protection against ‘UV’ rays and colour fading. It is widely used for roofing or as cladding and for covering of fencing of outer Boundary Wall of the building. The sheets provide the natural lighting as required, security & privacy to the enclosures and the Building. It further provides acoustic insulation to the building / enclosures.

This is one of the most important uses of FRP in the building industry as it provides a versatile medium of lighting and security protection. The translucent sheets are available in a variety of forms with the corrugated type being widely used. The heat and light transmission characteristics, lightness, toughness, weather resistance and self extinguishing properties make it particularly suitable for roof and vertical lighting of buildings. The corrugated sheets are made in a range of profiles which match corrugated steel and asbestos sheeting, thereby allowing an interchange of material to give desired degree of lighting.

Corrugated FRP translucent sheeting can also be used as a patio cover. Additional uses include garage doors, industrial building skylights and sidelights, yard and swimming pool, fences and awnings. FRP roof light sheets offers obvious advantages when compared to conventional glass skylights such as toughness and lightweight. They are also easier to handle and install.

FRP can be used for cladding other structural materials or as an integral part of either a structural or non-load bearing wall panel. For cladding structures of concrete or brick, flat sheets can be used. The advantages of FRP here is the ease of fabrication of large panels to minimize joints and are available infinite range of colored and textured surfaces. Fixing devices and joints should accommodate the movement caused by the differential thermal expansion between FRP and other materials, such as concrete and metal. FRP can impart an acceptable finish to asbestos sheets. Moulded FRP sheets backed by lightweight concrete and as inner skin of plaster can be used to clad high-rise steel frame buildings.

HAND-MOULDED FIBREGLASS REINFORCED PLASTICS (FRP) TRANSLUCENT ROOFING SHEET AS PER IS-12866

Nomenclature

Supply of “**Rooffit**” brand Fiberglass Reinforced Plastics (FRP) translucent Roofing sheets U/V Stabilized in desired thickness using semi-mechanized polyester film sandwiched process manufactured by ‘**Shiv Shakti Fibre Udyog**’ an **ISO-9001 Certified Company** in desired profile (Plain, Corrugated, Crinkle) and colour, made as per IS-12866 using glass fiber reinforced material powder grade as per IS-11551 & sheet grade unsaturated polyester resin as per IS-6746 and MMA (Methyl Methane Acrylate) for extra clarity. Thickness of sheet would be as per application or direction of Engineer-in-Charge.

Fixing Arrangement

FRP Translucent sheets are fixed on the existing M.S. Frame work using ‘J’ hooks or nut bolts along with rubber washers as per provision provided in the M.S. Structure.

Note: Sheets available in any thickness and profile as per requirement and application.

ADVANTAGES OF FRP SHEET OVER OTHER ROOFING & POLYCARBONATE SHEETS

FRP Translucent Roofing Sheets are chosen material for roofing, where controlled light transmission is required. As FRP are much stronger & stiffer material duly reinforced with glass fiber compared to other plastics & polycarbonate sheets. The corrugated profiles created in FRP is moulded process, whereas in other plastic & polycarbonate sheets is cold bending process which makes all the edges of bending a permanent weak point. Due to this moulded process in FRP Sheet, it gives better flexural rigidity reducing the deflection under wind, extreme of weathers as well as other incidental loads. Polycarbonate sheets are made generally thicker and in smaller sizes due to less rigidity and they require closer frame supports made of M.S. etc. FRP roofing and domes can be moulded in bigger size covering large spans and are also cost wise competitive with polycarbonate.

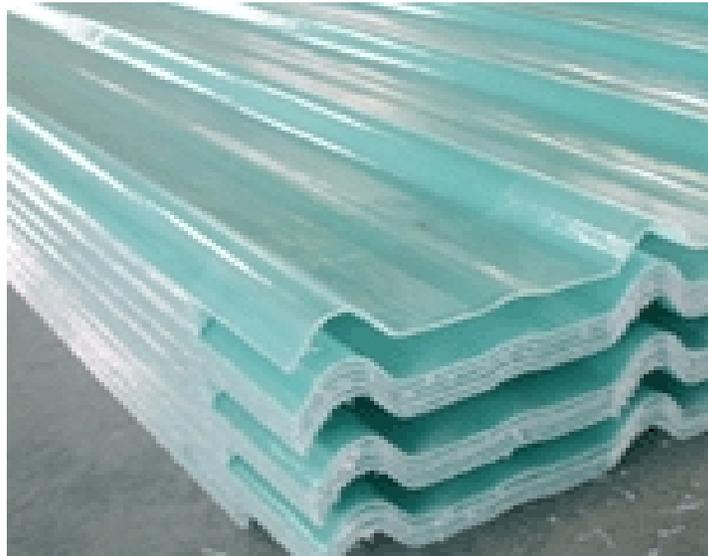
Most important, polycarbonate sheets being plastic material and co-efficient of expansion/ contraction are not compatible with PED/ M.S. structure, hence over a period of time tends to warp & also become brittle in the extremes of weather conditions.

Advantages of FRP Roofing Sheet over other Similar Skylight Sheet (Translucent & Transparent)

S. No.	Parameters	FRP Sheet	Acrylic Sheet	Polycarbonate Sheet
1.	Shatter Resistance	Yes	No	No
2.	Impact Resistance	Very High	Low	Medium
3.	Light Diffusion	Excellent	Glaring	Glaring
4.	Corrosion Resistance	Excellent	Poor	Good
5.	Thermal Insulation	Excellent	Poor	Poor
6.	Maintenance	Free	Frequent Replacement	Periodical Replacement
7.	Weight	Very Light	Light	Light
8.	U/V & anti aging film	Yes	No	U/V Optional Anti aging film- no
9.	Whether Resistant	Excellent	Very Poor	Medium
10.	Colour & Design	Many/ Versatile	Very Limited	Very limited
11.	Life	Min. 10 Years	Not Recommended	3-4 Years
12.	Co-efficient of expansion & contraction- vis-à-vis PEB/ M.S structure	Compatible	Very Poor	Not Compatible Notable Warping & Deformation after 1-2 years
13.	Tensile Strength	≥ 1050 kg/cm ²	-	< 676 kg/cm ²
14.	Co-efficient of Thermal Expansion	0.9-1.8/°C x 10 ⁻⁵	-	6.7/°C x 10 ⁻⁵
15.	Fire Performance (Opaque sheets)	Fire Retardant/ Optional	Highly Inflammable	Melts like Plastic

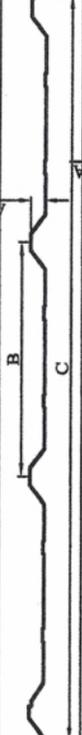
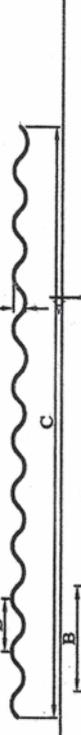
Properties

1. Excellent Corrosion resistant from all kind of water, alkaline, coastal environment, chemical fumes & extreme of weather temperature.
2. Shatter resistance & hailstorm resistant sheet.
3. High Impact Resistant Sheet.
4. Light Weight
5. Unbreakable
6. Dimension Stability even during long period of use.
7. Maintenance free
8. Thermal insulation: - FRP Sheets inherent advantage of inbuilt Thermal Insulation.
9. Environment friendly
10. Flexibility in sizes and thickness.
11. Freedom in colour & design.
12. Very long life (Warranty of 5 years against any manufacturing defect).

**FRP SHEETS - MACHINE MADE**

FRP SHEET DRAWING

FRP ROOFING PROFILES

S. NO	PROFILE	TROUGH DEPTH A	PITCH C/C B	WIDTH C	PROFILE NAME
01		32	250	1087	NATIONAL 1000
02		28	353	1126	NATIONAL 1060
03		30	250	1020	MULTI-RIB
04		31	195	855/1050	UNIMET
05		32	186	930	MULTI-CLAD
06		38	190	1060	ISPAT
07		44	130	694/824	UNIMET DECK
08		28.5	177.5	987	UNIMET TILE
09		41	215	430	MULTI-LOK
10		18	75	810	GC
11		50	146	1050	ASBESTOS

All Dimensions are in MM
 TOLERANCE LEVEL = ±10MM
 We also specialize in custom-made sheets to your requirements and specifications.

SPECIFICATION OF RAW MATERIAL

- ◆ Glass Fiber Chopped Strand Mat - IS: 11551: 1986
- ◆ Glass Fiber Rovings: IS: 11320: 1985
- ◆ Unsaturated Polyester Resin IS: 6746:1972

- ◆ Glass Fiber: Commonly known as Chopped Strand Mat is as per IS 11551-1986. Glass fiber chopped strand mat is used for reinforcement of unsaturated polyester resin systems. The type of glass fiber used is 'E' glass - a type of glass that does not contain more than 1% by mass of alkali, calculated as Na_2O commonly referred to as Low alkali glass.
- ◆ Glass Fiber Roving: As per IS 11320-1997 - commonly used for 'reinforcement of corners and edges.
- ◆ Unsaturated Polyesters Resin System: As per IS 6746-1972. The resin made by reacting saturated poly acids or anhydrides and unsaturated poly acids or anhydrides with polyols and dissolved in a suitable reactive monomer capable of under going cross linking, and those additives that are added or supplied by the supplier to attain certain properties, constitute the resin system. The minimum requirements to be specified shall be viscosity, acid value, gel time at 25°C and volatile content. The supplier shall declare nominal values for these properties.
- ◆ Curing Agents - Cobalt Napthanate (Accelerator and Methyl Ethyl Ketone Peroxide (M.E.K.P.) are the two hardeners used for curing of resins. These are mixed 2% by volume with resin for curing.
- ◆ N.C. Thinner: IS used for general cleaning and surface preparation for good bonding.
- ◆ PVA & Wax Polish as release agents.
- ◆ Pigments for desired colour as top coating.
- ◆ Gelcoat: Thixotropic unsaturated polyester resin as top two coats towards pigmentation and protection from all weir tier and extreme of weathers.
- ◆ Surface Mat: Surface mat is used as the initial and final layer during lining to have proper bonding with the existing surface and the top final for resin rich surface to protect from extreme of weathers.

FRP RAIN WATER GUTTER

Scope of Work

Supply and sealing of Fiberglass Reinforced Plastic (FRP) Gutter 4mm thick with step jointing of 50mm at site.

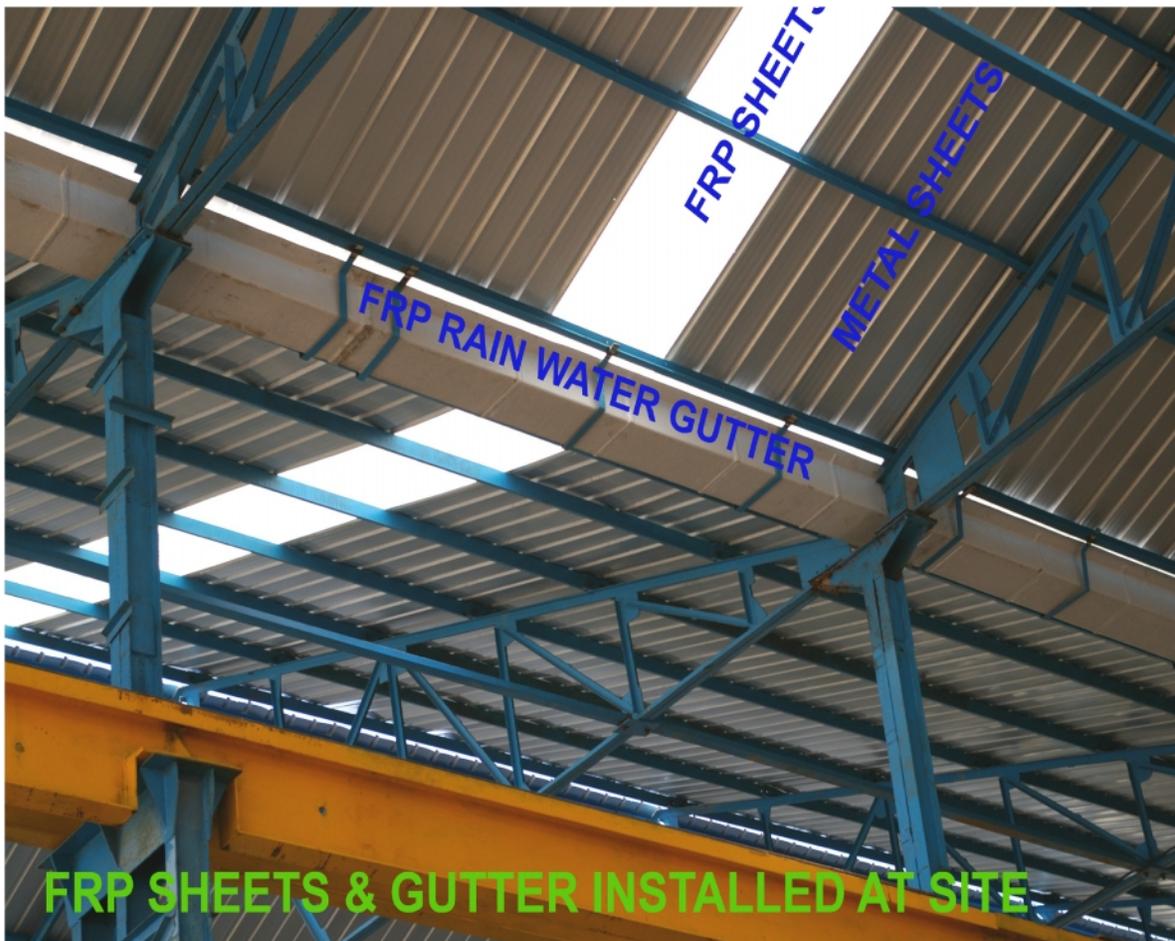
Nomenclature

Supply of 4mm thick FRP Gutter of “**Rooffit**” brand an **ISO-9001 Certified Company**, to be fabricated using two coats of Isophthalic grade UV stabilized Gel coat as top coating giving Glossy smooth surface on the top to take the extreme of weather and temperature followed by reinforcement of Chopped Strand Mat (CSM) and Woven roving (WR) duly impregnated with unsaturated polyester Isophthalic exterior grade UV stabilized resin to form tough laminate with extra reinforcement of MS strip of size 25 x 3 mm at a distance of 1000 mm c/c starting from one end of the gutter to be embedded with the gutter. The size of each gutter can be provided in 4.0-5.0 meters and color of your choice.

Advantages of FRP Gutter

1. Single Casted with no Joints: FRP Gutter are casted in one single piece (Monolithically casted) hence leaving no scope for any water, moisture, insects, dusts etc. to seep inside the gutter and pose problem towards maintenance, leakages or bad smell. Only FRP gutter can be made in single piece, unlike M.S., G.I. or asbestos.
2. Maintenance Free: FRP gutter are made with inbuilt color, single piece casting and smooth glossy finish hence practically requires no maintenance except for cleaning with plain cloth once in a while or cleaning with soap water. Moreover, as the gutter is made with inbuilt color, it has very long live without fading of color and requires no repainting over regular interval, unlike M.S. or G.I.
3. Very Long Life: FRP as a material is very tough & rigid and resistant to extreme of weather and there is no aging of the material as a result it retains the same luster, strength and rigidity over a very long period, unlike M.S. or G.I.
4. Resistant to weathering & UV exposure as the FRP gutter are UV stabilized.
5. Corrosion Resistant: Excellent water and chemical resistance- the gutter is constantly exposed to Water, Factory corrosive fumes and chemicals.
6. Ease of Handling: FRP gutter are tough, light weight & scratch proof hence easy to handle, transport & install at site.
7. Ease of Installation: FRP gutter is fabricated as per design and shape required and is provided with inbuilt step for ease of jointing at site.
8. Ease of Repair: FRP as a material can be very easily repaired at site for any local or major damage, if any & more over repaired area is not visible.
9. Good electrical & thermal properties.
10. Good aesthetic appeal, strength, durability, waterproof & are termite proof.
11. Good dimensional stability at high temperature unlike MS or GI.

12. Can resist very high impact strength, which is evident by its application in various fields of automobiles, railways, boats, aircrafts and defense etc.
13. Excellent Mechanical, Physical and Biological properties.
14. Advantageous strength / weight ratio and rigidity.
15. Molding size virtually unlimited.
16. Considerable design versatility.
17. Choice of wide range of inbuilt color - maintenance free finishes.
18. Fire Retardant-if required.



FRP GUTTER - INSTALLED AT SITE

WIND DRIVEN ROOF TURBO VENTILATOR

Nomenclature

Providing & Fixing of **“Rooffit” brand an ISO-9001 Certified Company** Wind Driven Turbo Ventilators in desired neck size (21" /24") with anodized aluminum technically designed fins with stainless steel top plate and bottom fixing rings supported with double ball bearing system mounted on monolithically casted matching profile FRP Base Plate in 2 mm thick aerodynamically designed hood, with special UV stabilized inbuilt colour, gelcoat coating to take extremes of weather/ wind velocity and continuous ventilation complete to the satisfaction of Engineer-In-Charge.

Application for Hot & Humid Areas

Industrial roofing, skylights buildings, green houses, garages / porches, commercial building, domes & canopy for industrial & commercial building, railways, school, warehouses & residential etc.

WIND DRIVEN INDUSTRIAL TURBO VENTILATORS with Matching Fiberglass Reinforced Plastic (FRP) BASE PLATE.

Ventilation is simply the process of replacing stale, hot air with clean & fresh air hence providing pleasant working environment.

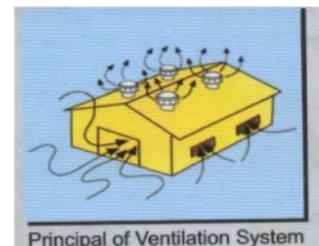
We are pleased to introduce ourselves as the leading manufactures of Wind Driven Industrial Turbo Ventilator with matching FRP Base plate, which enables the fixing & installation of turbo ventilator very convenient under various site conditions. Our Turbo Ventilator and the matching FRP base plate is technically designed to suit the various site conditions and provide maximum exhaust and rotation of air continuously, hence virtually providing pleasant and fresh air for healthy work environment. Our turbo ventilator is so designed having maximum fan blade hence providing optimal exhaust and at the same time is protective towards rain and dust.

Features & Advantages

- No Electricity – Wind Driven • Maintenance Free • Fresh Air 24 x 365 Days
- Uniform & Continuous Ventilation • Noiseless Installation & Operation • Easy to install • No Ingress of Rain Water • Fits on Any Type of Roof Surface and Gradient • Exhaust Stale, Hot, Humid Air and Fumes/ Pollutants Nonstop • Healthy Living - Increase in Productivity • Environment Friendly • Payback Period is Extremely Low – Good Savings • Rigid and Technically Designed Frame Construction to Withstand



Wind Driven Roof Turbo Ventilator



Principal of Ventilation System

Cyclone, Storm, High Wind Velocity and Twister • Turbo Ventilator are made in Aluminum and S.S. hence no Rusting • Suitable for any size Industrial, Commercial, Warehouse, Godown building.

Applications

- Automobile Industry • Food Industry • Textile (Spinning, Twisting, Sizing, Weaving, Dyeing, Knitting, Processing) • Chemical Industry • Engineering Industry
- Pharmaceutical Industry • Boiler House • Restaurants • Foundry • Generation House
- Commercial building • Public Halls • Residence And Many Other Places.

Kindly provide us the following information to calculate No. of ventilators

Name of Organization: _____

Address: _____

Reference Person: _____

Designation: _____

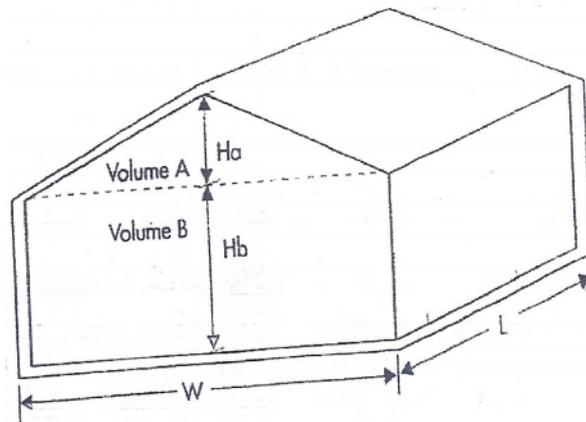
Address of Unit where to be Installed: _____

Dimensions

Length(L)_____ Width(W)_____

Height (Ha) _____ (Hb) _____

Note: All dimensions in Meters



S. No.	Particulars	Unit	Measurements
*1	Type of roof and make (AC Sheet /Metal/RCC)	-	
*2	Size of the sheets (L x B)	Mtr.	
3	Number of air change desired per hour	Nos. /Hr	
4	Avg. wind velocity (If available)	Kms /Hrs	
*5	Nature of plant activity	-	
*6	Types of Machinery installed	-	
*7	Number of persons working	Nos.	
8	Any Corrsivefumes or chemical discharge		
9	Existing Exhaust system (if any)		
10	Any special comment or requirement (if any)		

* Are Compulsory for our Estimation.

FRP CHEMICAL RESISTANT SHEET FOR ROOFING & CLADDING

Technical Note on FRP Chemical Resistant Sheets for Industrial Building Roofing or Cladding

Industrial Roofing and Cladding are exposed to extremes of weathering conditions, water, chemical fumes or chemical environment and constant exposure to humid conditions. Under these conditions Roofing & Cladding are prone to corrosion and selection of Roofing material should be done accordingly.

Normally, Color Coated Profile Metal Sheets in 0.5 mm thickness are used for roofing in combination with FRP Skylights, FRP Gutter, Turbo Ventilator and Accessories under normal weathering and environmental conditions. In general, Mild Steel are highly corrosive material even under normal environmental conditions but the same is color coated with few microns of weather resistant paints which has very limited self life. But in presence of harsh weathering, chemical fumes or coastal environments, the M.S. Color Coated Profile Sheets are under constant threat of corrosion and not recommended for Roofing taking into consideration of minimum 10 years self life.

FRP Skylight / Chemical Resistant Sheets is a Fiber Glass Reinforced u/v stabilized unsaturated Polyester resin system composite material consisting of a network of reinforcing glass fibers embedded in a matrix of thermosetting resin. FRP offers almost unlimited possibilities for shape, profile, size and color, which is known for its high resistance to wreathing & environmental corrosion, chemicals, fumes with inherent property of high strength, durability, water, chemical proof, light weight, dimensional stability, aesthetic appeal and easy to install and maintain.

At “**Rooffit**” we are India’s First World Class Continuous Machine molded Fiber Glass Reinforced Plastics (FRP) Skylight Roofing Sheets.... in any Profile & length with 15 – 20 years life to fast replace the other conventional Roofing Systems.

Nomenclature of FRP Chemical Resistant Profile Roofing / Cladding Sheets

Supply of “**Rooffit**” brand Continuous Machine Made Fiberglass Reinforced Plastics (FRP) Translucent / opaque Roofing Sheets u/v stabilized in desired thickness, profile & color using chemical resistant unsaturated Isophthalic grade Polyester resin as per IS – 6746 duly reinforced with continuous fiberglass powder grade material as per IS – 11551 and MMA (Methyl Methacrylate) for extra clarity translucent sheets or gelcoated opaque sheets as per drawing, color & profile to provide complete resistance towards extremes of weathering, water, chemical fumes and environment.

Properties & Advantages

- a. Excellent corrosion resistant from all kind of alkali, acid, chemical fumes, coastal environment, water and extremes of weather & temperature.
- b. Superior Tensile Strength** – FRP Sheets has very high tensile strength to weight ratio.

- c. **Thermal Properties** – FRP Sheets have a low co-efficient of thermal expansion with compatible co-efficient of expansion and contraction vis-à-vis PEB/M.S. Structure.
- d. **Dimensional Stability** – FRP Sheets do not shrink or stretch within the limits of their strength even during long period of use.
- e. **Electrical Characteristics** – FRP Sheet has high di-electric constants.
- f. **Considerable Design Versatility** – Can be molded to match your profile in any transportable length.
- g. Available in Translucent & Opaque as required.
- h. Barcoal Hardness, water absorption, Fiberglass content & light transmission as per IS – 12866.
- i. Shatter and hail storm resistance sheet.
- j. High impact resistant sheet.
- k. Light weight and unbreakable.
- l. Environment friendly.
- m. Flexibility in sizes, color and thickness (as per span of Purlins)
- n. Maintenance free, easy to handle and install.
- o. Fire-retardant properties if required.
- p. Very long life — 15-20 years with anti-ageing film.



FRP CHEMICAL RESISTANT CLADDING SHEETS FOR CHEMICAL TREATMENT PLANT

FRP CHEMICAL LINING

Fiberglass Reinforced Plastics (FRP) lining is protective lamination on the desired surface (RCC, MS, WOOD, PLASTICS, etc.) to provide corrosion resistance against water, chemical proofing, high strength, dimension stability, and is known for its ease of application, maintain, and repair.

FRP lining is widely used in chemical industries for atmospheric corrosion resistance, weatherproofing, water, chemical proofing, and to maintain the purity of the material stored inside the containers. Further, FRP lining is used for repair and maintenance of wide range of RCC, construction like over head storage tanks, pipe lines, building construction cracks, water/chemical proofing, bridges & flyover constructions cracks etc. which provide not only corrosion resistance but also high strength and dimension stability at low cost and ease of application.

The desired reinforcement is given by use of fiberglass, which is available in various ranges and is applied as per requirement and utility. Ranges of fiberglass reinforcement are – CSM, Woven Roving, and Surface mat, Honeycomb mats. For corrosion resistance, water, chemical proofing wide range of resins like Isophthalic, Bisphenol, Vinyl Ester etc. are available and is applied as per requirement.

Raw Material used in FRP Lining

1. Glass Fiber—confirming to IS-11551-1986
2. Glass Fiber Rovings—confirming to IS-11320-1997
3. Unsaturated Polyester Resin confirming to IS-6746-1994
4. Cobalt Napthanate (Accelerator)
5. MEKP (Methyl Ethyl Ketone Peroxide)-Curing Agents.
6. N.C Thinner – for cleaning and surface preparation.

Steps for FRP Lining

1. The desired surface to be lined is cleaned properly using iron paper, grinders or sand blasting as required and proper surface is prepared free of water, grease, foreign deposition etc. The surface is checked properly to ensure excellent bonding between the surface & the FRP lining.
2. Once the surface preparation is done, as required, resin coat is applied and allowed to cure. This coat should fill up all the pinholes and the damaged area of the surface.
3. After coating, as desired, fiberglass mat (CSM)- Chopped Strand Mat is then spread on the surface and is wetted with resin and properly brushed to ensure minimum air trapping and good bonding with the surface. Fiberglass layers are applied depending on the thickness to be given. The lamination is allowed to cure.
4. Once the lamination is cured immediately one layer of surface mat (veil) is applied as final layer followed by one resin rich coat of resin for better corrosion resistance.
5. During lining, precaution are taken for proper bonding and if required custom-made arrangements are made like provision of inbuilt M.S/Wooden/aluminum stripe / pegs are provided.

6. Precaution is also taken at the time of surface finish as required and cracks; pits etc. are properly filled during surface preparation.
7. Good workmanship and supervision is of prime importance during execution of job, which needs technical and specialized workers to do the same.
8. FRP lining provides complete leak proofing, corrosion resistance, strength and very good life for virgin material lining as well as for old structures etc.



FRP CHEMICAL LINING ON TANK & VESSELS

POLYCARBONATE SHEET

Polycarbonate Sheets are an excellent Roof glazing & cladding material with remarkable properties and performance making them one of the ideal choices for natural light transmitting for Roof glazing, Skylights, Pathways, Bus shelters, Shopping Archades, Canopies, Partitions, Greenhouses, Industrial glazing etc.

Polycarbonate sheets are a perfectly ideal medium for use in the Industrial, Commercial, Domestic, Govt. & Leisure Segments.

Range

Polycarbonate sheets are available in 3 different types, which can be used for various roof glazing application.

1. Transparent Plain Compact Sheets
2. Transparent Plain Embossed Sheets
3. Multi-Wall Sheets

S. No.	Type	Standard Dimension	Thickness	Color
1.	Plain Compact Clear / Embossed Sheets	30.0 mtrs. x 1.22 mtrs.	1.5mm-10mm	Clear, Opal White, Grey Blue, Bronze, Green
2.	Plain Compact Clear / Embossed Sheets	30.0 mtrs. x 2.1 mtrs. (Subject to availability)	1.5mm-10mm	Clear, Opal White, Grey Blue, Bronze, Green
3.	Multi-Wall	11.8 mtrs. x 2.11 mtrs.	6mm-10mm	Clear, Opal White, Grey Blue, Bronze, Green

Profiles

Solid Polycarbonate sheets are available in any matching Customised Profile to meet your requirements.

Advantages

Light Weight
Design Flexibility
U/ V Resistance
High Impact Strength
Excellent Light Transmission
High Durability
Rust Proof
Eco-Friendly

Applications

Industrial Roofing
North Light
Parking Area
Garages & Verandahs
Porches & Walkways
Stadium
Partition & Window Glazing
Domes & Canopies

Note: - FRP Sheets has all the above advantages with added feature of Shatter Resistance- (FRP Sheets are Hailstorm resistant), Excellent Light Diffusion & Less Heat Transmission with more Freedom in Color & Design.



POLYCARBONATE DOME



POLYCARBONATE MULTIWALL SHEETS

METAL SHEETS

METAL HI-RIB TRAPEZOIDAL ROOF PANEL SHEETS

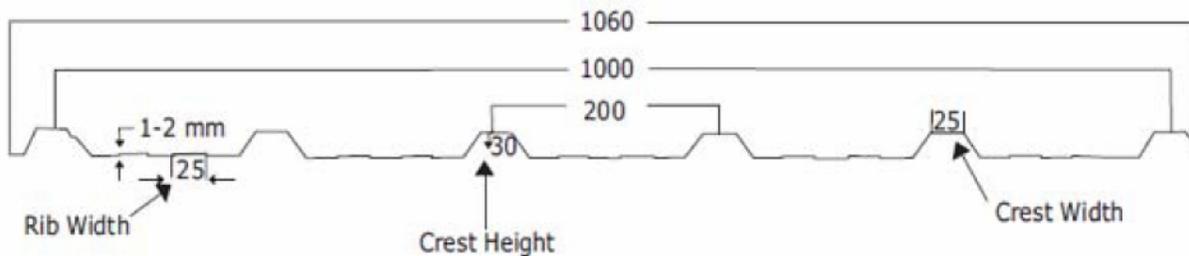
With high precision roll-forming & component forming machines, we maintain highest standards & you can be assured of quality & reliability of “Rooffit” Metal sheet roofing products.

Metal Roofing Sheets are available in Galvalume (Bare & Coloured) & pre-painted galvanised iron (PPGI). These roofing sheets are available in the range of superior & asthetic colours for roofing & wall cladding. These roofing sheets have excellent corossion & weather resistance thereby ensuring no maintainence and long durability of the roofing system.

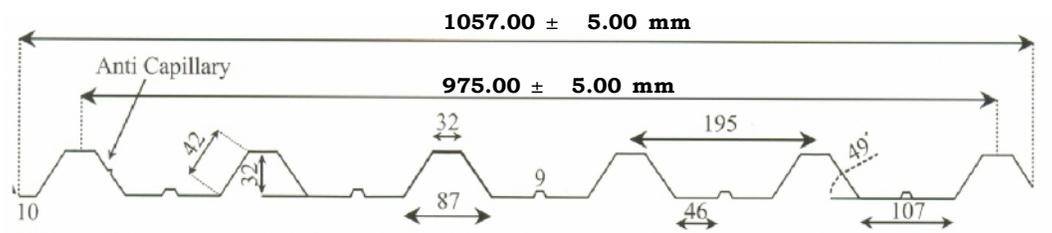
Galvanised Steel comprises of galvanized coating over mild steel of minimum coating mask 120 gms per sq. meter as per IS : 277 & tensile strength of minimum 240 MPA.



HI-RIB PROFILE



Parameter	Dimensions
Tough Depth	30mm
Pitch	200 mm
Supplied Width	1060 mm
Covered Width	1000 mm
Length	upto 12.0 meter or on mutally agreed basis
Thickness Range	0.30-0.80 mm



Parameters	Code	Standard Requirement	Tolerance
Depth of Profiled Sheet	D	32.00 mm	± 2.00 mm
Pitch of Profiled Sheet	P	195.00 mm	± 5.00 mm
Overall Width of Profiled Sheet	O	1057.00 mm	± 5.00 mm
Effective Width of Profiled Sheet	E	975.00 mm	± 5.00 mm
Return.Leg	RL	10.00 mm	± 5.00 mm

Tolerances

1. Tolerance on length is +10.0/-0.00 mm
2. Diagonal difference 5mm max.

Load Chart

Sheet TK mm	Load Case	Purlin Spacing Meter										
		1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0.35	Udi-DLLL	306.4	230.2	177.3	139.5	111.7	90.8	74.8	62.4	52.5	44.7	38.3
	Udl- wind	574.6	431.7	332.5	261.5	209.4	170.2	140.3	116.9	98.5	83.8	71.8
0.4	Udi-DLLL	395.7	297.3	229	180.1	144.2	117.2	96.6	80.5	67.8	57.7	49.5
	Udl- wind	741.8	557.4	429.3	337.7	270.4	219.8	181.1	151	127.2	108.2	92.7
0.47	Udi-DLLL	521.6	391.9	301.9	237.4	190.1	154.6	127.4	106.2	89.4	76.1	65.2
	Udl- wind	978.1	734.8	566	445.2	356.4	289.8	238.8	199.1	167.7	142.6	122.3
0.5	Udi-DLLL	574.4	432.3	333	261.9	209.7	170.5	140.5	117.1	98.7	83.9	71.9
	Udl- wind	1078.9	810.6	624.4	491.1	393.2	319.7	263.4	219.4	185	157.3	134.9
0.6	Udi-DLLL	736.8	553.6	426.4	335.4	268.5	218.3	179.9	150	126.3	107.4	92.1
	Udl- wind	1381.6	1038	799.5	628.8	503.5	409.4	337.3	281.2	236.9	201.4	172.7

Note:

DLLL

Dead Load + Live Load (Deflection Limitation : Span/180)

UDL-Wind

Uniform Distributed Load - Wind (Deflection Limitation Span / 120)

Full Properties					Reduced Properties			
Thick mm	Weight Kg/m ²	Area Cm ²	I _{xx} Cm ⁴	Z _{xx} Cm ³	Small Flange in Comp		Large Flange in Comp	
					I _{xx} Cm ⁴	Z _{xx} Cm ³	I _{xx} Cm ⁴	Z _{xx} Cm ³
0.55	5.393	6.875	10.849	5.095	10.060	4.088	6.814	3.583

I_{xx} Cm⁴ Moment of Inertia	Z_{xx} Cm³ = section Modulus
--	--

30mm Deep Profile – 1000mm Cover Width		Applied Load in kN/m ²						
Thick mm	Load Type	Span in Metres						
		1.2	1.4	1.6	1.8	2.0	2.2	2.4
0.55	Dead+Super	4.49	2.84	1.88	1.31	0.94	0.70	0.52
	Wind Suction	4.19	2.66	1.80	1.28	0.94	0.72	0.57

Deflection: Dead + Super Loads = L/200 Deflection: Wind Suction Loads = L/150
Note: All Intermediate values within the limits of the table may be obtained by linear interpolation.

CLIP LOK PROFILE

Clip Lok Profile is a strong, durable, versatile, and long-length roof. It combines the strength of steel with smart fluted pans and a lock-action rib design. Even for roof pitches as low as 20 where no ends laps are used, the interlocking ribs, together with concealed fastening, ensure weather resistance. It is designed particularly for low-pitch roof application. **Clip Lok Profile is a screwless roof with unmatched performance.**



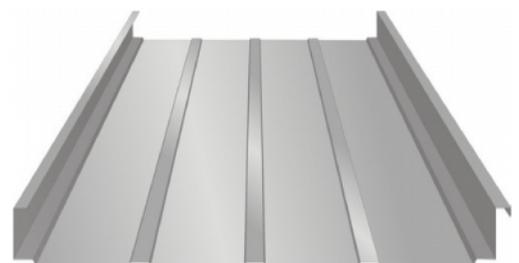
CLIP LOK PROFILE

Base Steel		Metalic Coating	Color Coating	Weight (Kg/m ²)
Strength (Mpa)	Thickness (TCT) mm			Clip Lok Profile
G550 High Tensile	0.47	Zinc	Bare-Al Zn	4.25
	0.50	Aluminium		4.52
	0.55	Alloy Coated	Polyester Super	4.97
	0.60	AS 1397	Polyester	5.43
G300/240	0.50	Galvanized IS 277	PVDF	4.72
	0.55			5.19
	0.60			5.66

STANDING SEAM ROOF SHEET

Standing Seam Roof System is steel roofing like membrane structure covering the entire building with panels joint together with a double lock standing seam and a uniquely designed clip like, formed into the seam at site in a unique fixing style that requires no drilling of holes. The panels are joint and are permanently seamed together with a full 360° double lock seam to prevent 100% moisture / water leakages making it dust free with no overlapping joints along the slope or holes unlike other fixing methods adopted for sheet roofing.

The unique feature of standing seam roof is its ability to accomodate thermal expansion and contraction. This fixing arrangement system allows for the roof talk to practically float over the structure without being affected by temperature variations and it also allows the roof to withstand high wind uplift nodes.



STANDING SEAM PROFILE

Advantages

- ◆ No overlap joints along the span of the roof hence completely eliminating water leakages.

- ◆ Requires lighter support structure as compare to other metal roofing profiles and systems.
- ◆ Standing Seam Roofing sheets can be fabricated at site in desired length of any size as per site conditions hence eliminating cost of transportation and damages.
- ◆ As the sheets are seamed hence there is no physical damage in terms of puncturing the sheets for making holes making provision for fixing as done in other roofing system, eliminating leakages and corossion.
- ◆ The fixing arrangement is so technically designed having provision for thermal expansion and contraction hence no warping or bending of sheets due to extremes of weather and temperature.
- ◆ With no perforation or exposed fasteners, standing seam roofing offers an exceptionally durable and maintainence free roof for years.

STEEL DECKING SHEET

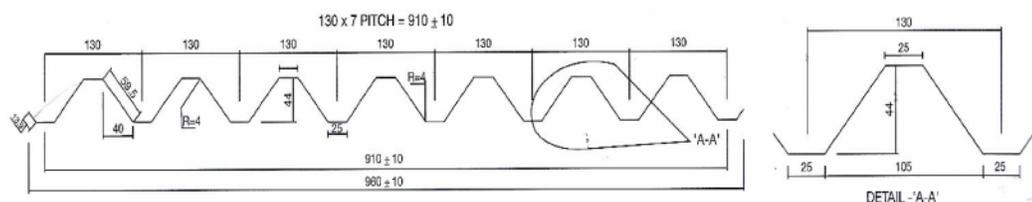
Our range of steel decking profiles made out of Plain Cold Rolled (CR) steel, Galvanized Steel (GP), and Colour Coated Steel (CCS) with yield strength ranging between 240 to 550 Mpa.

Details of Base Material

Cold Rolled Steel	As per IS 513
Galvanized Steel	As per IS 277 (120 to 450 Gsm)
Colour Coated Steel	As per IS 14246-95
Aluzinc	150 AZ

Specification

Input Width	1090 mm +/- 2 mm
Overall Width	840 mm +/- 10 mm
Effective Width	790 mm



Pitch	130 mm
Depth	44 mm

Note:

1. All dimensions are in mm.
2. Dimensional tolerance are as per IS-277-2003 (Av. of measurements).
3. Yield strength of steel sheet shall be 250 mpo minimum.
4. Base metal thickness 0.80 mm.

Load Capacity

BMT	Yield Strength	Total Uniform Distributed Load kg.m ² (For 1 m Width)				
		Max permissible span in meters				
		1.0 m	1.5 m	2.0 m	2.5 m	3.0 m
mm	mpa	ms	ms	ms	ms	ms
0.63	220	1375	610	340	220	150
0.63	550	1830	810	455	290	200
0.8	220	1740	770	435	275	190
0.8	550	2325	1030	580	365	255
1.0	220	2165	960	540	340	235
1.0	550	2890	1280	720	460	315

Advantages

- ◆ It will reduce the shuttering time and cost.
- ◆ It will enable fast construction of building roofs and floors, thereby saving up to 50% of construction time of the slab and roof.
- ◆ Once designed as composite structural, it will allow either to reduce or to eliminate the structural steel used in RCC slabs.
- ◆ Internal plastering of roofs can be eliminated because steel roof decking gives aesthetic look internally also.

Product Applications

- ◆ Rooffit Roof Decking range offers a variety of metal thickness (0.50 mm to 1.00 mm) profile and finish to meet differing requirements regarding span, insulation, water proofing, imposed load, and any other considerations.
- ◆ It can be used as a permanent structural support member for slab.

RIB TILE PROFILE

Our colour metal roofing is the most versatile product in the market and offers you both elegance and flexible design for any building need.

Material Specifications

Pre-painted Galvanized Steel Sheets (GI-Base)
 Hot dipped galvanized pre-painted steel sheet.
 Zinc Alum Steel Sheet (Galvalume) Non-colour
 (55% Aluminium 43% Zinc 1.6% Silicon)
 Alu Zinc Coating : AZ 150 (Option AZ 100)



RIB TILE PROFILE

Advantages

- ◆ Economical Roof Profile with excellent design flexibility.
- ◆ 250 mm pitch for easy water shredding.
- ◆ Available in 0.47, 0.50, 0.55, 0.60 mm thickness.
- ◆ Cover width Rib in 1010 mm available upto 13 m in length.
- ◆ Special side lap corrugation gives extra support at panel overlap.

WAVE TILE PROFILE

Our colour metal roofing is the most versatile roofing product in the market and offers you both elegance and flexible design for any building need.

Material Specifications

- ◆ Maximum pitch 200 mm.
- ◆ Minimum crest 33 mm.
- ◆ Depth with cover width of 1000 mm.
- ◆ Using 0.3-0.6 mm colour coated steel as per IS – 14246.
- ◆ Zinc coating of 120 Gsm/m².
- ◆ Top organic coating of polyester paint 16-18 microns.
- ◆ Over 5-7 microns epoxy primer.
- ◆ Back coat of 7-10 microns epoxy paint.
- ◆ Sheet to be longer in required length up to 13 meters.
- ◆ Fixed using self drilling and self tapping screws of size 12 x 14 x 25 mm.
- ◆ Sealed with integrated EPDM rubber washer for water tight fixing.
- ◆ Side laps to be stitched using Aluminium pop rivets.



WAVE TILE PROFILE

Key Features

- ◆ Architecturally attractive, durable and add aesthetic look to the building.
- ◆ Strong, resistant to fire and to all weather conditions.
- ◆ Easy to assemble. Saves time and labour cost.
- ◆ Light, easy to handle and store.
- ◆ Does not brake, crack or leak.
- ◆ Environment friendly.
- ◆ Thickness available 0.3-0.6 mm.
- ◆ Length any size from 1 mtrs. to 13 mtrs.
- ◆ Offers the beauty of clay tile with minimal dead weight on the roof.
- ◆ Unbeatable hurricane, hail and all-weather resistance.
- ◆ It also eliminates problems of pest infestation and rot that occur with wood and clay roofing material.

CURVED PROFILE SHEET

Metal Profile Sheets are available in round (Concave/Convex) curved sheets to match the structural design giving architectural features to the building. The span (radius) are as per your requirement down to minimum recommendation of 500 mm.



CURVED PROFILE

ACCESSORIES

'Z' & 'C' PURLINS

'Z' & 'C' Purlins are structural members designed and produced using the advanced technology, quality and customer oriented services, for use as secondary supports for economical roof sheeting and wall cladding systems in any type of building with following added advantages:

1. Continuous splay or splicing for better structural strength, stability & economy.
2. 45° Lip for better sectional modulus and easy nesting. These are supplied in required length with pre-punched holes for quick bolting. The system gives an excellent strength to weight ratio with flexibility for specific size requirement.

Surface Treatment

'Z' & 'C' purlins are made of Hot Rolled Coils are degreased, phosphated and then primer finished with Zinc Chromate Red Oxide Paint-matching test requirement of IS : 4777 and IS : 2074.

Special treatment to combat severe atmospheric corrosion can be offered...



'Z' & 'C' PURLINS



SCREWS



SCREWS

SCREWS



LOUVERS

LOUVERS

FRP GRATINGS

“Rooffit” brand FRP Grating as compared with other floor materials like Metal, PVC or RCC, provides a series of benefits, unmatched superior impact resistance, while the strength-weight ratio is only one fourth of that of steel gratings. Hence FRP gratings are easy to handle, cut and install and can be customized to customer’s requirements as per site condition, utility application and weathering conditions.

“Rooffit” brand FRP Gratings is the ideal solution for corrosion problem faced in industrial environments. The FRP grating is non-conductive of electricity and non-magnetic, great appearance, ease of installation and Maintenance Free.

Features of FRP Gratings

1. Excellent physical, mechanical/chemical & atmospheric resistance properties.
2. Excellent electrical insulation properties.
3. Dimensional stability.
4. Excellent insulation properties with high impact strength.
5. Self extinguishable with high level of safety.
6. Minimal distortion and higher mechanical strength.
7. Total elimination of maintenance cost.
8. Easy to handle, store & Install.
9. Corrosion resistant and fire retardant.
10. Light weight, Long lasting and maintenance free.
11. Suitable for horizontal & vertical layouts.
12. Excellent strength - weight ratio compare to steel.
13. Low thermal conductivity.
14. Excellent temperature & weathering properties.
15. UV stabilised
16. Anti-skid top surface.



FRP GRATINGS

Application of FRP Gratings

1. Flooring
2. Trench & Drain Covers
3. Platforms & Walkways
4. Electrical Cable Trays
5. Stairways, Hand Rails & Ladders.
6. Chemical Pipelines Carriage Trays.
7. FRP Cross Arms for Electric Applications.
8. All Load Bearing Structures using FRP Pipe, Angle, Channel & Girders.

Technical Data

Functions	Characteristic
Corrosions Resistance	The FRP Grating is suitable to be used in corrosive situations such as acid, alkali etc.
Fire Resistance	Self Extinguishable with high level of safety.
High Strength	Under equal application situation, it's weight is only 1/3 to 1/5 of steel, but it's strength reaches the strength of normal steel. The material function is different from plastic material (no obvious brittle failure. It's deform is changed along with the change of stress but no scaling relations between them. It fully absorbs impact force while keeping its shape because of its comparative smaller elasticity modulus. FRP Gratings are made of high quality fiber glass and resins. The product could transfer heat to release if added ultra-violet resistance material-having stronger aging-resistance function Have better anti-skid function and could prevent injuries from fall.
Electrical Properties	<p>A. Being high insulation its dielectric strength is 100kv per inch, therefore, it could keep safe while walking on the FRP Grating.</p> <p>B. Non-electric spark. Therefore, it could be used in such circumstances as mine combustion gas etc. For avoiding the accident caused by spark.</p> <p>C. Non-Magnetism. The product could take the iron or steel grating and be used in the magnetism-sensitive circumstances.</p> <p>FRP Grating initially will be more costly than iron/steel but, in the longer run due to its non-maintenance and longer service life will be more economical and durable. FRP Gratings have low-life settle costs as compare to steel & other related products.</p>

Mechanical Behavior

A deflection arrow equaling 1:150 of the span is considered standard in practice. The following table lists the maximum admissible loads for reaching this arrow as a function of the span.

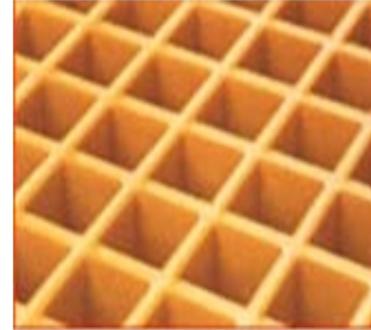
Span (m)	Distributed Load (Kg./m ²)		Concentrated Load (Kg.)	
	Section 25 mm	Section 30 mm	Section 25 mm	Section 30 mm
0.40	>5,000	>5,000	>5,000	>5,000
0.60	3,000	5,000	3,000	5,000
0.80	1,300	2,300	900	1,600
1.00	680	1,200	380	670
1.20	400	700	100	170
1.40	280	500	-	-

Types of Gratings

- a) Molded Gratings
- b) Pultruded Gratings

Molded Gratings: “Rooffit” Molded Gratings is made of continuous Rovings Fiberglass which are fully soaked with suitable unsaturated polyester resin with continuous solidification monolithically casted mold system, whose uniform structure provides perfect bi-directional mechanical properties. “Rooffit” molded FRP grating has excellent corrosion resistance with inbuilt color and UV Stabilization. Different unsaturated Polyester resin has different physical, mechanical and chemical property of corrosion resistance and weathering properties.

The resin being widely used include orthophthalic Polyester resin, Isophthalic Grade, Vinyl Ester resin with optional fire retardant properties. Widely used resin for this kind of application is vinyl Ester based FRP Gratings which provides excellent corrosion and weathering resistance.



FRP MOLDED GRATINGS

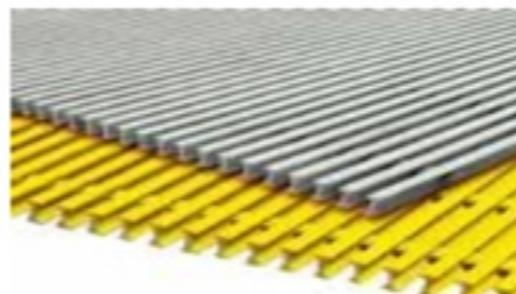
Available Sizes for Moulded Grating

S. No.	Depth (MM)	Mesh Size (MM)	Available Size (Max.)
1.	25	38	3' x 10', 4' x 8', 4' x 12'
2.	38	38	3' x 10', 4' x 8', 4' x 12'
3.	50	50	4' x 12'

Pultruded FRP Gratings: “Rooffit” Pultruded Gratings is specially fabricated for applications that call for high strength, excellent corrosion resistance, exposed to various weathering and industrial conditions. Since Fiberglass is the key Raw Material of FRP Gratings strength, the content of fiberglass roving’s used is 55-60% of the total weight, which can guarantee very high strength over large span.

The Pultruded FRP Gratings is made by pulling thermoset resin together with continuous fiberglass roving’s through a heated mold in desired profile and size with temperature control at different sections of the die to facilitate resin to cure. It is a continuous and highly efficient method of producing a standard cross section. A Pultruded Grating consists of I or T shaped structural members (The load Bearing Bars) that are mechanically strung together with evenly placed dowels or cross bars. As a result of this system’s construction, this can be assembled in various panel sizes and with multiple cross rod and bar spacing to provide for different requirements. The main benefit of the Pultruded type is higher glass content which provides for superior load capacity.

So, Pultruded FRP gratings are manufactured by assembly of Pultruded I beams (Load Bearing Members) & Pultruded Cross Rods (Cross Locking Members). The average distance between the I Beams is 40 mm, whereas the distance between the cross rod varies as per the load requirement of the application as per table given below:-



FRP PULTRUDED GRATINGS

S. No.	I Beam Size (MM)	Cross Rod Distance (10-12mm)	Recommended Load (kg/ Sq. Mtr.)	Color
1.	25/38	300mm	400	Yellow/ Grey/ Black/ Green
2.	25/38	200mm	500	Yellow/ Grey/ Black/ Green
3.	25/38	150mm	750	Yellow/ Grey/ Black/ Green
4.	25/38	100mm	1020	Yellow/ Grey/ Black/ Green

Note: 1. For large qty. above 2000 sq. mtrs., customized size & color can be supplied.
2. Grid size can vary depending on the size, span & load bearing capacity.

Ease of Installation

Working with fiberglass is comparable to working with wood, with slight differences in cutting procedures. **Rooffit's** FRP Grating can be fabricated in the field by the end-user. We recommend on-site fabrication to ensure accurate and timely installation.

Finishing

All cut surfaces should be coated with resin to prevent corrosion of fiberglass. Edge Seal Kit is available with polyester resin, catalyst, brush and stirrers for ease of coating. Be sure to seal all cut edges prior to installation.

Standard Installation Clearances

Provide a minimum of ½" support for all edges of a **Rooffit's** FRP Grating panel.

- Anti-slip
- Impact Resistant
- Weatherproof
- Non-sparking
- Lightweight
- Easy To Install
- Non-magnetic
- Fire Retardant
- Non-conductive
- Maintenance Free
- Non-skid Surface
- Corrosion Resistant

We are fabricating and molding the items as per customer's specifications and requirement. We can offer new products to customer's satisfaction by maintaining the special requirement of physical and mechanical properties, chemical resistance and dimensional tolerances. We are manufacturing machine covers, wind mill tips, electric pole, etc. as per customer's requirement.

FRP CABLE TRAY

Rooffit's offer a wide range of FRP (GRP) cable trays, which are used to allow trolley speed, separate power and control cables. Our range of cable trays are manufactured with all modern techniques and also these are available in various combinations of cables, hoses and fibre optic cables. These trays are easy to maintain and reduction in cable length makes this product very much user-friendly.

Features of Composite FRP Cable Trays

- ◆ **Resistance to Corrosion:** Composite FRP cable trays are corrosion resistant to basic environment, salt water etc. These Cable trays are also resistant to electrolytic corrosion due to contact of two metals in humid environment. This unique property contributes to reduce the life cycle costs of cable trays.
- ◆ **Mechanical Strength:** Strength to weight ratio of FRP is very high compare to conventional materials.
- ◆ **Thermal and Electrical Insulation:** Composite FRP cable trays are having excellent thermal insulation (1000 times less heat conductor than aluminium) and electrical insulation (-6kv / mm) properties hence no spark risks due to contact with other material.
- ◆ **Easy Installation:** The tray construction is such as to facilitate easy handling and to ensure easy laying of cable without causing damage to cables. A quick and reliable assembly reduces your installation time upto 50% . It is easy to work i.e. Cut, drill on sight no burring, no finishing and no risk of injury and no requirement of electrical continuity test.
- ◆ **Self Extinguishing:** Composite FRP Cable trays are with inbuilt fire retardant property in accordance with ASTM E-84 and 1S-6746.
- ◆ **Resistant to Ultra Violet Light:** An additive material is mixed with the FRP to make them resistant to ultraviolet light.



FRP CABLE TRAYS

- ▶ Bolted Cable Tray **Rooffit** is also offering cable tray in bolted format also. These cable trays are absolutely defect free and are resistant toward all other conditions. The cable tray has the following features:

- ◆ Manufactured out of 1.6mm to 4mm M.S. sheet with channel size of 25mm = 75mm = 15mm & 25mm = 100mm = 25mm as side member.

- ◆ Rung side of 15mm = 35mm = 15mm & 20mm = 50mm = 20mm at the interval of 250mm C/C.
- ◆ Finished with Red oxide paint / Hot dip galvanized in 2.5 Mtrs each without welding.

FRP LADDERS

We offer a range of high grade FRP Ladders that can be tailored as per the specifications provided by our clients. Our single support steps possess an addition side that has an angle support. Known for its versatility and light weight, these aluminum single ladders are fitted with non-skid rubber shoe which ensures good grip & prevents the scratches on the floor. Only one individual is required to easily carry the ladder.



FRP LADDER

FRP LADDERS FOR ELECTRICAL MAINTENANCE

FRP safety ladders are available in extension and self-standing varieties. They are safe for electrical maintenance extension ladders, up to 40ft, and A-type step ladders, up to 15ft. Mobile platform trolleys are also available.

FIBRE GLASS AND FRP CROSS ARMS

Suitable for 11kV and 33kV overhead transmission lines, these FRP and fibre glass cross arms are ideal for coastal sites (being corrosion resistant) and in remote rural areas, where they save birdage faults. **Rooffit's** FRP and fibre glass cross arms are approved by the Nigerian Integrated Power Project (NIPP) and REC.

GRP LADDERS AND SAFETY CAGES

GRP ladders, with or without safety cages, are used as manhole ladders. Ladders are made to any size and offer exceptional strength, whilst providing you with the benefit of a lightweight and corrosion resistant product. Walk-through tops are made to order. All cleats, brackets and fixings are in stainless steel or FRP.

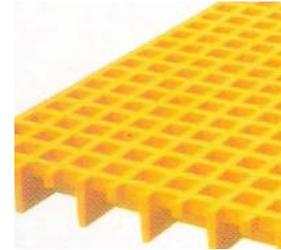
FRP WALKWAYS, PLATFORMS & INDUSTRIAL RAILINGS



FRP MINI-MESH

FRP Grating Mini-Mesh helps to prevent small tools and other objects from dropping through to the ground beneath. Lightweight Mini-Mesh panels are readily removable and allow for easy access under the installation.

FRP Grating Mini-Mesh flooring system is a low cost alternative to stainless steel and other materials in applications where corrosion resistance is essential. MINI-MESH is long lasting and maintenance free, making it ideal for outdoor applications with high esthetic demands.



FRP MINI-MESH

FRP, SMC JUNCTION BOXES- POLYCARBONATE

Rooffit is offering a vast range of **FRP, SMC Junctions Boxes** in different sizes, shapes and designs. These Boxes are using optimum quality raw material that provides them with durability and strength. These boxes ensure excellent protection to the components kept inside it and provide safety against dust, dirt and liquids.

The Features of the FRP, SMC Junctions Boxes are:

- ◆ Corrosion resistance
- ◆ High load bearing capacity
- ◆ Light weight



FRP, SMC JUNCTION BOXES

FRP STANDARD PROFILES

Rooffit's FRP pultruded profiles are available in a variety of profiles such as I-beams, channels, angles, flat strips and notch bars. A non-conductive, chemical resistant structure for gratings, ladders and solid rods for electrical or chemical environments.



INDUSTRIES

Electrical Sub-Station
Caustic and Chlorine
Effluent Lines
Food and Electric
Chemicals
Pigments and Dyes
Rubber
Textiles
Hospitals
Agriculture

Electrical Distribution Companies
Dairy and Food Processing
Chemical Fertilizers
Heating & Plumbing
Metal Finishing
Power Plants
Soap and Detergents
Water Treatment
University and Industrial Lab
Air Pollution Control

Brewing and Distillery
Electroplating and Picking
Fisheries
Air Conditioning
Petrochemicals
Pulp and Paper
Sewage Treatment
Materials Handling
Solvents and Organic Chemicals

INSULATED ROOFING COMPOSITE PANELS

Pre-fabricated Composite Panels or Insulated Panels for Roofing & Cladding are Sandwich Panels manufactured with profiled Color Coated Metal – Zinc Coated / Galvalume Coated Steel Sheets or FRP / GRP Profiled Sheets duly Sandwiched with PUF (Polyurethane Foam) as the insulation material.

The Panels are available in various colors and total thickness of panel range from 30 mm to 100 mm. The PUF Panels are ready-to-install and self supporting with high overall stiffness.

ADVANTAGES & ESSENTIAL FEATURES

1. Very high thermal insulation – Superb thermal efficiency & rigidity.
2. Ready-to-Install and self supporting.
3. Inner and outer skin in Pre-coated GI / Galvalume / FRP Sheets are resistant to extremes of Weather & corrosion.
4. Very light weight to high strength ratio.
5. Ease of handling & installation.
6. For Roofing & Cladding provision of specially designed overlap system to ensure water leak proof & airtight joints.
7. Vertical & horizontal Panels are provided with Tongue & groove joints to ensure air tight assembly.
8. Monolithically Constructed Panels, hence saving on support structure, no use of wire mesh or loose insulation / Glass wool to be fixed separately and ease of handling & installation with less of labour.
9. Withstand against storm, heavy rainfall, wind.
10. Sturdy enough for temperature (-180°C to +140°C).
11. Fire retardant and Self extinguishing.
12. Low maintenance.

APPLICATIONS

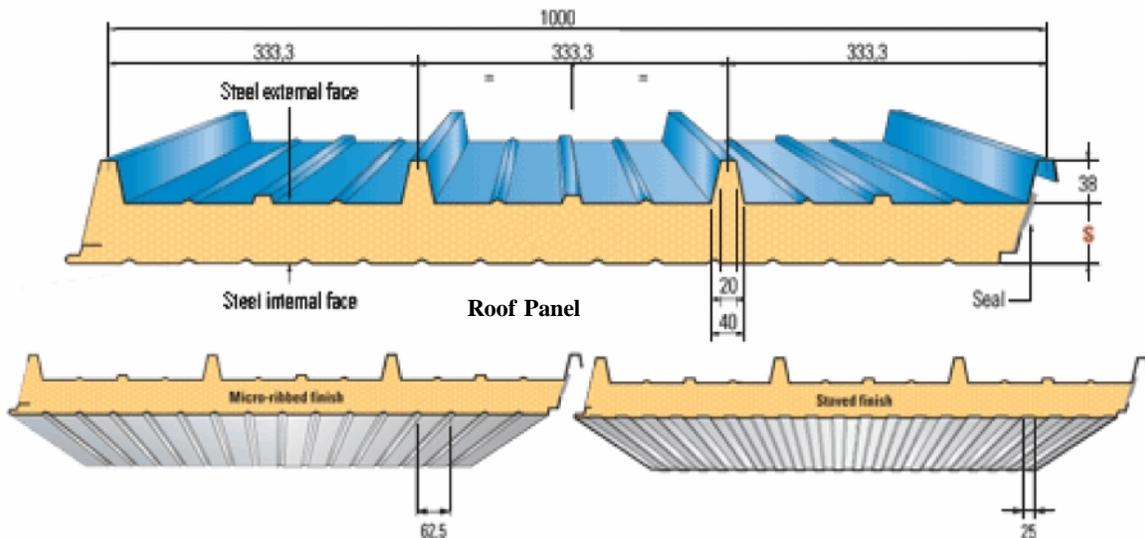
1. Industrial Building & Sheds – Automobile, chemical, steel, cement, power plants, pharamaceutical, commercial building, godown, etc.
2. Telecom Shelters
3. Cold Storage & rooms.
4. Pre-fabricated Shelters / Defense Shelters.

RANGE OF INSULATED COMPOSITE PANELS

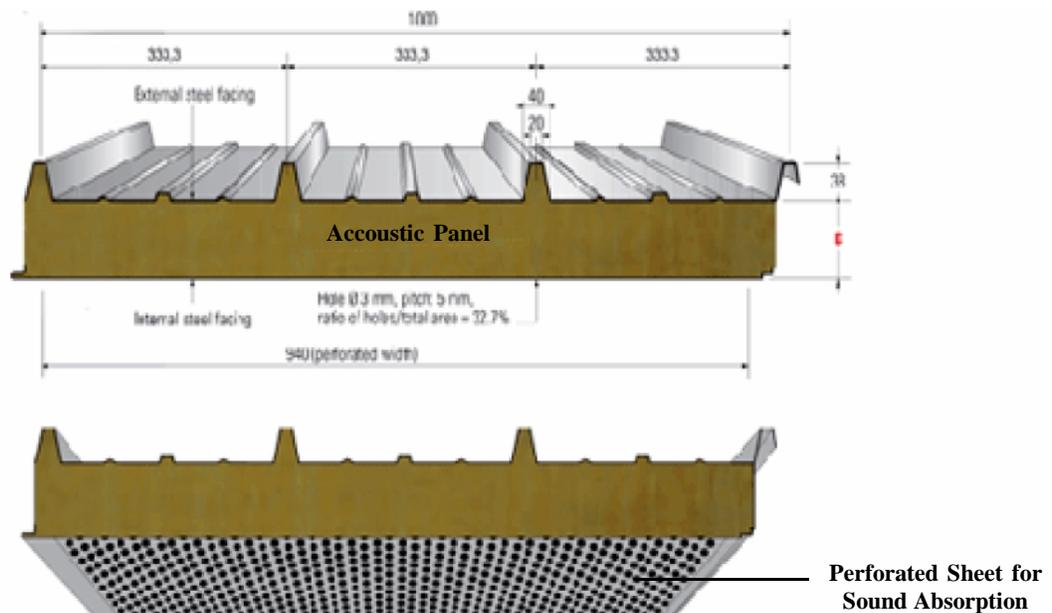
1. Insulated Roofing & Cladding Panels for pitched Roofs with minimum slope of 7 – 8%.
2. Insulated Roofing & Cladding Accoustic Panels.
3. Insulated Wall Panels with Tongue & Groove jointing system for use in Industrial, commercial, refrigerated rooms & Cold Storage.
4. Fixing accessories like flashings, corner joints and customized fittings.

DETAILS OF INSULATED COMPOSITE PANELS

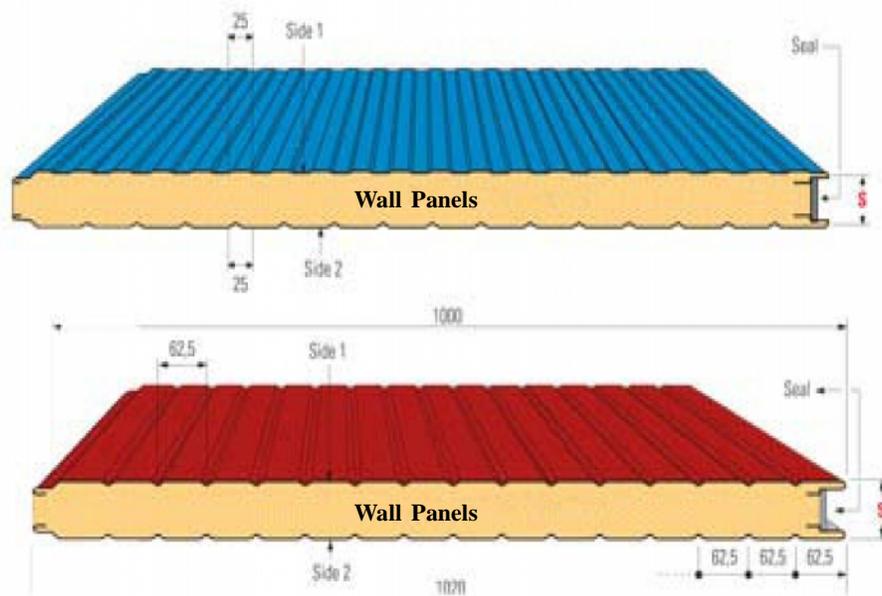
Insulated Roofing & Cladding Panels are self-supporting Metal panel for pitched Roofs with minimum slope of 7 – 8%. Normally, recommended thickness for Top exposed external face in steel is 0.5 (TCT) mm and internal face in steel is 0.4 mm. The same sheets can be replaced as per utility in corrosive environment with FRP in 2 mm & 1.5 mm thick sheets respectively. The insulation used is PUF (Polyurethane).



Insulated Roofing & Cladding Acoustic Panels are self-supporting Panel System insulated with rock wool which require a high degree of fire resistance and enhanced Acoustic properties. The panels are also available with Sand absorption properties in which internal metal sheets are perforated for better sand insulation.



Insulated Wall Panels with Tongue & Groove jointing system for use in Industrial, Commercial, Refrigerated Rooms & Cold Storage. Insulated with PUF and are self supporting panels for use in Industrial Building Partition, Telecom Shelter, Cold Storage, Defense Shelters, Porta Cabins, High Altitude Cabins, Commercial Buildings etc. The Panels are provided with tongue and groove systems for jointing Air tight system.



Fixing accessories like flashings, corner joints and customized fittings. All the above panels are available in required thickness as per customers requirements and site conditions. All necessary standard accessories are provided for proper fixing & erection of complete system.

INSULATION PROPERTIES OF PUF PANEL

S mm	K K.cal / M ² - hc	U W / M ² k	Panel Wt. Kg / M ² 0.5 + 0.4 mm (± 5% Tolerance)
30	0.48	0.59	9.42
40	0.40	0.46	9.80
50	0.33	0.38	10.15
60	0.28	0.33	10.55
80	0.22	0.25	11.30
100	0.18	0.21	12.10

SPECIFICATION OF PUF SHEET

1. Density	:	40 ± 2 Kgs m ³
2. Compressive Strength at 10% deformation	:	2.1 Kgs/cm ³
3. Tensile Strength	:	4.0 Kgs/cm ²
4. Bending Strength	:	4.2 Kgs/cm ³
5. Adhesion Strength (Foam to Steel)	:	3.0 Kgs/cm ²
6. Dimensional Stability (48 hours)		
-25°C	:	0.1%
+38°C & 90% RH	:	0.1%
+100°C	:	0.4%
7. Closed Cell Content	:	90-95%
8. Temperature Range	:	-180°C to +140°C
9. Temperature Conductivity at 0°C	:	0.018k Cal/m-hm/°C
(design value 0.020 k Cal/m-hr/°C or 0.023 w/m k)		
10. Water Absorption	:	0.2% volume at 100% RH
11. Vapour Permeability (At 90% RH & 38°C)	:	0.8/0.12 GMS/HR m ² as per IS 11239
12. Fire property extent to burn as per BS 4735	:	Max. 100 mm
13. Type	:	Self extinguishing

BUILDING PRODUCT RANGE

FRP DOORS & FRAMES

Nomenclature

FRP Door Shutter – Panel Type

Supply & fixing of factory made 30mm thick Fiberglass Reinforced Plastic (FRP) paneled door shutter of required colour of “**Rooffit**” brand or equivalent **an ISO-9001 Certified Company**, made with fire-retardant grade unsaturated polyester resin, moulded to 3mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5mm thick FRP laminate for panels and conforming to IS: 14856 – 2000 including fixing to frames complete as per direction of Engineer-In-Charge.

FRP Door Shutter – Flush Type

Providing & fixing of factory made 30mm thick Fiberglass Reinforced Plastic (FRP) flush door shutter in different plain colour of “**Rooffit**” brand or equivalent **an ISO-9001 Certified Company**, made with fire retardant grade unsaturated polyester resin, moulded to 3mm thick FRP laminate all around, with suitable wooden blocks inside at required places for fixing of fittings and polyurethane foam (PUF) / Polystyrene foam to be used as filler material throughout the hollow panel, casted monolithically with testing parameters of FRP laminate confirming to table-3 of IS : 14856 : 2000, complete as per direction of Engineer-in-charge.

FRP Door Frame

Providing and fixing of factory made Fiberglass Reinforced plastic (FRP) Door Frames of “**Rooffit**” brand or equivalent **an ISO-9001 Certified Company**, having three legged of cross-section 90mm x 45mm having single rebate of 32mm x 15mm to receive shutter of 30 mm thickness. The laminate door frame molded with fire retardant grade unsaturated polyester resin and chopped mat. Door frame laminate shall be 2 mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiberglass from all sides. M.S. stay shall be provided at the bottom to steady the frame.

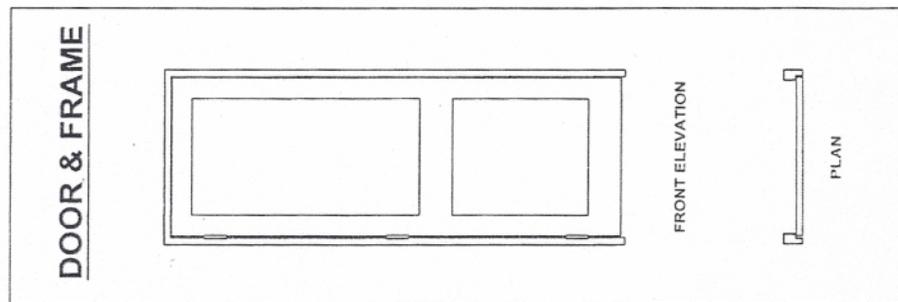
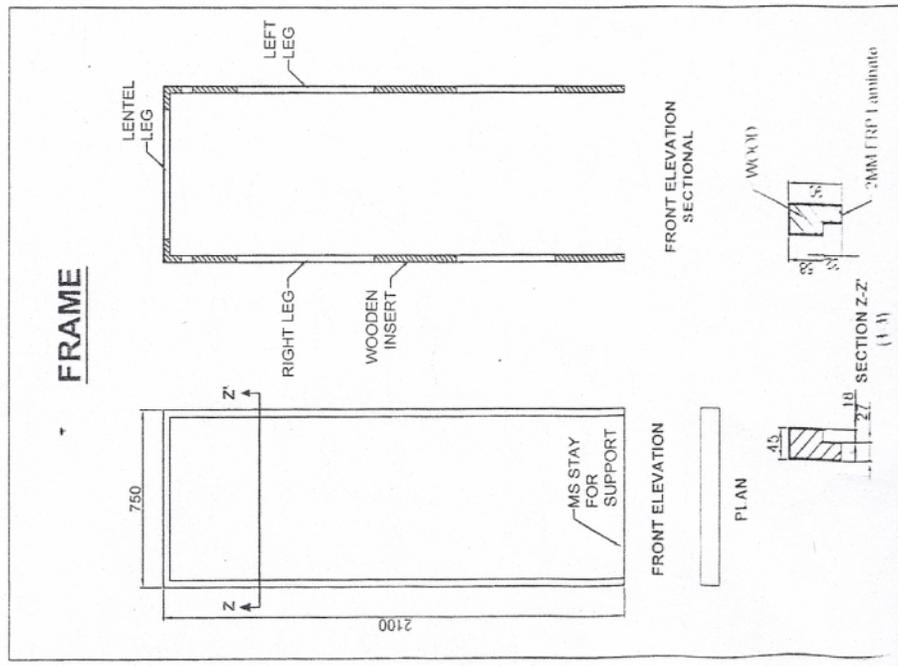
Applications

Toilet, bathroom, kitchen, mumty & internal doors for Housing, factories, warehouses, commercial, school & institutions.

FRP FRAME DRAWING

NOTES	
1.	Contractor to check & verify all dimensions before execution of the work.
2.	Figured dimensions should be followed.
3.	All dimensions are given in MM.
4.	Drawing is based on door manufactured
5.	Frame & Door Shutter is made of FRP & suitable wooden Inserts.
6.	The color of Door (Shutter & Frame) shall be as approved by Engineer In-charge.
7.	All builder Hardware shall be fixed as directed by Engineer In-charge.

FRP FRAME	
Plan, Elevation & other Details	
DATE	
DRN	
CHKD	
SCALE	1:25
DRG No.	



ADVANTAGES OF FRP DOOR SHUTTER & FRAME

1. Single casted with no joints: FRP door shutters are casted in one single piece (Monolithically casted) hence leaving no scope for any water, moisture, insects, dusts etc. to seep inside the door and pose problem towards maintenance or bad smell. FRP doors are the only doors, which can be made in single piece, unlike PVC, wood or metallic doors.
2. Maintenance free: FRP door shutters are made with inbuilt color, single piece casting and smooth glossy finish hence practically requires no maintenance except for cleaning with plain cloth once in a while or cleaning with soap water. Moreover, as the doors are made with inbuilt color, it has very long live without fading of color and requires no repainting over regular interval, unlike PVC, wooden or metallic door.
3. Very long life: FRP as a material is very tough & rigid and resistant to extreme of weather and there is no aging of the material as a result it retains the same luster, strength and rigidity over a very long period, unlike PVC, wooden or metallic doors.
4. Resistant to weathering & UV exposure as the FRP door are UV stabilized.
5. Corrosion resistant: Excellent water and chemical resistance. As the toilet door shutters are constantly exposed to water & acid being used for cleaning, FRP as a material are the most suited for this, unlike PVC, wooden or metallic doors.
6. Ease of handling: FRP door shutters are tough, light weight & scratch proof hence easy to handle, transport & install at site.
7. Ease of installation: FRP door shutters are provided with inbuilt hinge slots & proper inserts are being provided in the door & are fixed & installed by any normal carpenter.
8. Ease of repair: FRP as a material can be very easily repaired at site for any local or major damage if any & more over repaired area is not visible.
9. Good electrical & thermal properties.
10. Good aesthetic appeal, strength, durability, waterproof & are termite proof.
11. Good dimensional stability at high temperature unlike PVC or wood.
12. Can resist very high impact strength, which is evident by its application in various fields of automobiles, railways, boats, aircrafts and defense etc.
13. Excellent mechanical, physical and biological properties.
14. Advantageous strength / weight ratio and rigidity.
15. Moulding size virtually unlimited.
16. Considerable design versatility.
17. Choice of wide range of inbuilt colour - maintenance free finishes.
18. Fire retardant.
19. Excellent screw holding capacity of the FRP Door Shutters due to proper wooden insert being provided in the design.

PVC DOORS & FRAMES

Nomenclature - PVC Doors

Type I — PVC Solid Foam Sheet Door

Providing & Fixing 30 mm thick “Rooffit” brand Factory made Solid PVC Door Shutter Consisting of Frame made out of M.S. tubes of 19 gauge thickness and size of 19 x 19 mm for styles, top & bottom rails. M.S. Frame shall have a coat of steel primers of approved make and manufacture. M.S. frame covered with 5 mm thick heat molded “Rooffit” PVC ‘C’ channel of Size 30 mm thickness, 70 mm width out of which 50 mm shall be flat and 20 mm shall be tapered in 45° angle on either side forming styles; and 5 mm thick, 95 mm wide PVC Sheet out of which 75 mm shall be flat and 20 mm shall be tapered in 45° on the inner side to form top and bottom rail and 115 mm wide PVC Sheet out of which 75mm shall be flat and 20mm shall be tapered on both sides to form lock rail. Top, bottom and lock rail shall be provided either side of the panel. 10mm (5 mm x 2 mm) thick, 20 mm wide cross PVC sheet shall be provided as gap insert for top rail & bottom rail. Paneling of 5 mm thick solid sheet to be fitted in the M.S. Frame welded/ sealed to the styles & rails with 7 mm (5 mm + 2 mm) thick x 15 mm wide PVC Sheet beading on inner side, and joined together with solvent cement adhesive etc. An additional 5 mm thick PVC strip of 20 mm width is to be stuck on the interior side of the ‘C’ channel using PVC solvent cement adhesive etc. complete as per direction of Engineer-in-charge, manufacturer’s specification & drawing.

Type II — PVC Solid Foam Profile Door

28 mm thick Door shutter made of solid PVC Foam profile with homogenous fine cellular structure having smooth outer integral skin having 71 mm width & 28 mm thick as styles and rails. Joints are made using solvent adhesive and GI ‘C’ sections (39 mm x 19 mm x 0.6mm thick) or M.S. pipe (40 mm x 20 mm) stiffener frame insert & telescopic ‘L’ corners. The panel shall be filled with 3mm thick high-pressure compact laminate.

Type III — UPVC Profile Door

30 mm thick Polyvinyl Chloride (PVC) Door Shutter made of styles and rails of a UPVC hollow section of size 60 x 30 mm and wall thickness 2 mm - 0.2 mm with inbuilt decorative moulding edging on one side. The styles and rails mitred and joined at the corners by means of M.S. galvanized plastic brackets of size 75 x 220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of shutter reinforced by inserting galvanized M.S. tube of size 25 x 20 mm and 1mm ± 0.1 mm wall thickness. The lock rail made up of “H” section, a UPVC hollow section of size 100 x 30mm and 2 mm ± 0.2 mm wall thickness fixed to the shutter styles by means of plastic/ galvanized M.S. “U” cleats. The shutter frame filled with a UPVC Multi Chambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm ± 0.1 mm wall thickness. The panel filled vertically and tie bar at two places by inserting horizontally 6mm galvanized M.S. rod and fastened with nuts and washers.

Nomenclature - PVC Frame

Type I — PVC Solid Foam Sheet Frame

Providing & Fixing PVC Door Frame of size 50 x 47 mm with a wall thickness of 5 mm, made out of extruded 5 mm PVC sheet, miter cut at two corners and joined with 2 nos. of 150 mm long brackets of 15 x 15mm M.S. square tube. The two vertical door profiles are to be reinforced with 19 x 19 mm M.S. Square tube of 19 gauge. EPDM rubber gasket weather seal to be provided through out the frame. The door frame shall be fixed to the wall using 65/100 mm long M.S. Screws through the frame by using PVC fasteners. A minimum of 4 nos. of screws to be provided for each vertical member & minimum 2 nos. for horizontal member etc. complete as per manufacturers specification and direction of Engineer-in-charge.

Type II — PVC Solid Foam Profile Frame

Door Frame (Single Rebate) made of solid PVC Foam Profile with homogenous fine cellular structure having smooth outer integral skin having 60 mm width and 30 mm thickness and shall be fixed to wall.

Type III — UPVC Profile Frame

UPVC Door Frame made of UPVC extruded section having an overall dimension as below (tolerance $\pm 1\text{mm}$) with wall thickness $2.0\text{ mm} \pm 0.2\text{ mm}$, corners of the door frame to be mitred and welded of plastic, galvanized brackets and stainless steel screws. The hinge side vertical of the frames reinforced by galvanized M.S. tube of size 19 x 19 mm and 1mm $\pm 0.1\text{ mm}$ wall thickness and 3 nos. stainless steel hinges fixed to frame.

1. Extruded section profile size 48 x 40mm
2. Extruded section profile size 42 x 50mm

FRP CHAJJA

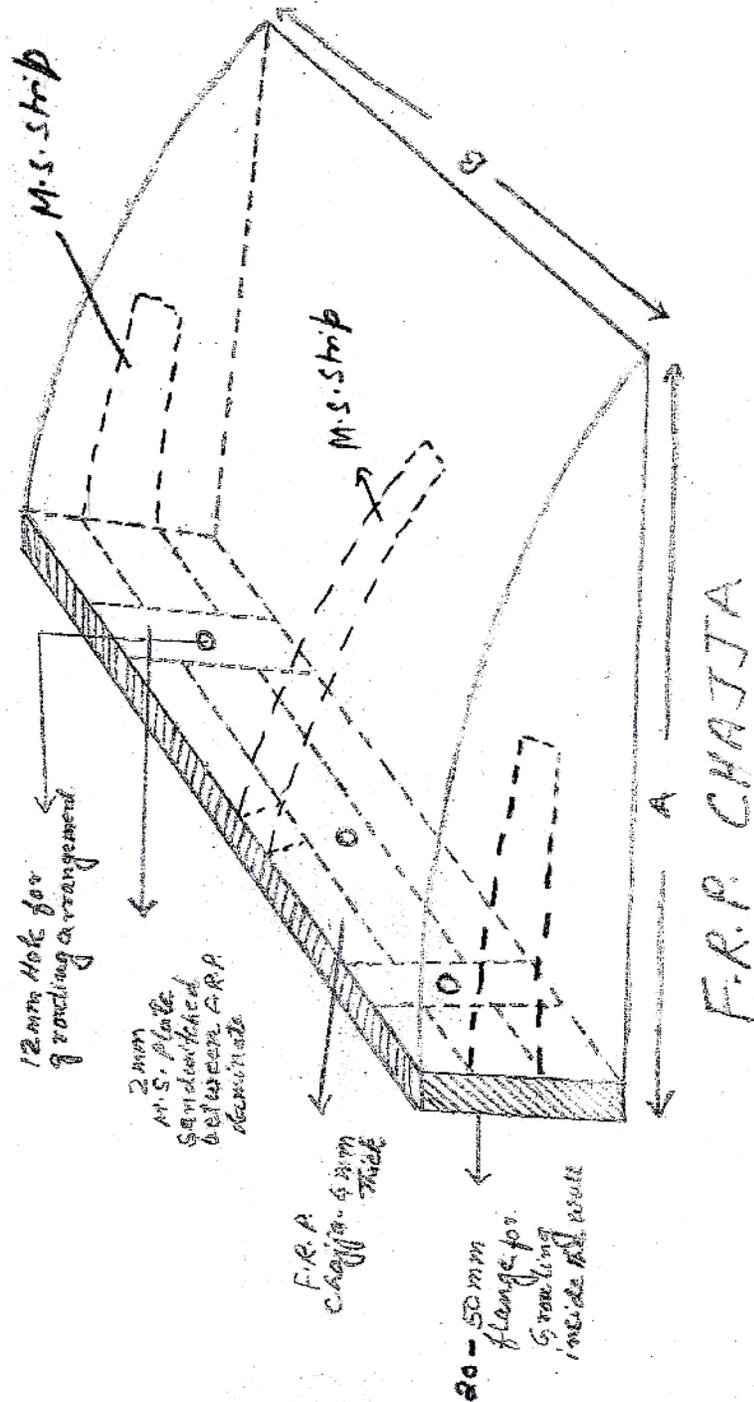
Nomenclature

Providing & fixing of **“Rooffit” brand and ISO-9001 Certified Company**, factory made Fiberglass Reinforced Plastics (FRP) “CHAJJA”- 4mm thick of required colour, size and design made by Resin Transfer Moulding (RTM) Machine Technology, resulting in void free compact laminate in single piece, having smooth gradual slope curvature for easy drainage of water and duly reinforced by 2 nos. vertically and 1 nos. horizontally 50 x 2 mm thick M.S. Flat with 12 mm in built hole for grouting on the existing wall along with the 50mm flanges duly inserted and sealed in the wall complete in one single piece casted monolithically including all necessary fittings. The FRP Chajja should be manufactured using unsaturated Polyester resin as per IS: 6746 duly reinforced with fiberglass chopped strand mat (CSM) as per IS: 11551 complete with protective Gelcoat U/V coating on Top for complete resistance from the extreme of temperature, weather & sunlight.

Material for Construction and Details

1. Process of manufacturing: - RTM Machine moulding technology – FRP Chajja to be made in one single pc. With no joints. (Monolithic casting).
2. Gelcoat with desired pigment for outer coating. (U/V Stabilized)
3. Unsaturated polyester resin as per IS-6746.
4. Glass fiber reinforcement –Chopped Strand Mat (CSM) as per IS – 11551.
5. The Glass fiber roving used shall be as per IS – 11320.
6. Curing Agents-MEKP & Cobalt Napthalate.
7. Permissible fillers are French chalk powder and shall not exceed 10% by weight of unsaturated polyester resin.
8. 2 mm M.S. Plate reinforcement on the backside of the FRP Chajja to be inserted between the layers of FRP Laminate.
9. Flange arrangement to be provided in the FRP Chajja for grouting inside the existing wall to make it water proof.
10. Both side smooth glossy finish.
11. Tolerance of ± 10 mm in overall size of FRP Chajja.
12. Thickness of FRP Chajja to be 4.0 mm.

FRP CHAJJA DRAWING



NOMENCLATURE OF ITEM AS PER DSR – 2007 & RAILWAY SOR – 2010

S. No.	Description	DSR Code	SOR Code
1.	FRP PANEL DOOR: 30 mm thick Glass Fiber Reinforced Plastic (FRP) paneled door shutter of required colour and approved brand and manufacture, made with fire – retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5mm thick FRP laminate for panels and conforming to IS: 14856 – 2000 including fixing to frames.	9.122.1	078320
2.	FRP FLUSH DOOR: Providing of 30 mm thick Fiberglass Reinforced Plastic (FRP) flush door shutter in different plain and wood finish made with fire retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate all around, with suitable wooden blocks inside at required places for fixing of fittings and polyurethane foam (PUF) / Polystyrene foam to be used as filler material throughout the hollow panel, casted monolithically with testing parameters of FRP laminate confirming to table-3 of IS : 14856 : 2000, complete as per direction of Engineer-in-charge.	9.122.2	078330
3.	FRP FRAME: Providing of Fiberglass Reinforced Plastic (FRP) Door Frames of three legged of cross – section 90 mm x 45 mm having single rebate of 32 mm x 15 mm to receive shutter of 30mm thickness. The laminate doorframe molded with fire retardant grade unsaturated polyester resin and chopped mat. Doorframe laminate shall be 2mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiberglass from all sides. M.S. stay shall be provided at the bottom to steady the frame.	9.121	078310
4.	FRP SHEET: Providing Continuous Machine Made U/V Stabilized Fiberglass Reinforced Plastics sheet Roofing up to any pitch including fixing with polymer coated 'J' or 'L' hooks, bolts & nuts 8mm dia. G.I. Plain /bitumen washers complete but excluding the cost of purlins, rafters trusses etc. The sheets shall be manufactured out of 2400 TEX panel rovings incorporating minimum 0.3% Ultra – violet stabilizer in resin system under approximate 2400 psi and hot cured. They shall be of uniform pigmentation and thickness without air pockets and shall conform to IS 12866. The sheets shall be opaque or translucent, clear or pigmented, textured or smooth as specified.	—	103090
	1. 2mm thick Corrugated		103091
	2. 2mm thick Profiled		103092
	3. 2mm thick Flat.		

S. No.	Description	DSR Code	SOR Code
4a.	<p>FRP SHEET: Providing and fixing UV Stabilized Fiberglass Reinforced Plastics sheet Roofing up to any pitch including fixing with polymer coated 'J' or 'L' hooks, bolts & nuts 8mm dia. G.I. Plain /bitumen washers complete but excluding the cost of purlins, rafters trusses etc. The sheets shall be manufactured out of 2400 TEX panel rovings incorporating minimum 0.3% Ultra - violet stabilizer in resin system under approximate 2400 psi and hot cured. They shall be of uniform pigmentation and thickness without air pockets and shall conform to IS 10192 and IS 12866. The sheets shall be opaque or translucent, clear or pigmented, textured or smooth as specified.</p> <p>(a) 2mm thick corrugated (2.5" or 4.2 or 6")</p> <p>(b) 2mm thick Flat.</p>	<p>12.47</p> <p>12.47.1</p> <p>12.47.2</p>	<p>—</p>
5.	<p>FRP CHAJJA: Providing of factory made Fiberglass Reinforced Plastics (FRP) "CHAJJA"- 4mm thick of required colour, size and design made by Resin Transfer Moulding (RTM) Machine Technology, resulting in void free compact laminate in single piece, having smooth gradual slope curvature for easy drainage of water and duly reinforced by 2 nos. vertically and 1 nos. horizontally 50 x 2 mm thick M.S. Flat with 12mm in built hole for grouting on the existing wall along with the 50mm flanges duly inserted and sealed in the wall complete in one single piece casted monolithically including all necessary fittings. The FRP Chajja should be manufactured using unsaturated Polyester resin as per IS: 6746 duly reinforced with fiberglass chopped strand mat (CSM) as per IS: 11551 complete with protective Gelcoat U/V coating on Top for complete resistance from the extreme of temperature, weather & sunlight.</p>	<p>9.128</p>	<p>8713</p>
6.	<p>FRP GUTTER: Supply of 4 mm thick FRP Gutter to be fabricated using two coats of Isophthalic grade UV stabilized Gel coat as top coating giving Glossy smooth surface on the top to take the extreme of weather and temperature followed by reinforcement of Chopped Strand Mat (CSM) and Woven roving (WR) duly impregnated with unsaturated polyester Isophthalic exterior grade UV stabilized resin to form tough laminate with extra reinforcement of MS strip of size 25 x 3 mm at a distance of 1000 mm c/c starting from one end of the gutter to be embedded with the gutter . The size of each gutter can be provided in 3-3.5 meters and color of your choice.</p>	<p>—</p>	<p>103093</p>

OTHER CREDENTIALS

CLIENT LIST



PARTIAL LIST OF OUR CLIENTS

S. No.	Our Clients & End User Clients
1.	Steel Authority of India (Durgapur)
2.	Larsen & Toubro Ltd.
3.	S. K. Mines
4.	IISCO Steel Plant
5.	ISO Lloyd Engineering Technologist Pvt. Ltd.
6.	Era Metal Building Systems
7.	Kirby Building System India Pvt. Ltd (Chennai)
8.	Kirby Building System India Pvt. Ltd (Haridwar)
9.	Kirby Building System India Pvt. Ltd (Hyderabad)
10.	Tecpro Systems Ltd
11.	NTPC, Korba
12.	NTPC, Bongaigaon
13.	Good Year India Ltd
14.	Suzuki Motor Cycle India Pvt. Ltd
15.	Maruti Suzuki Ltd
16.	Honda Siel Car India Ltd
17.	Escorts Agri Machinery Group
18.	Escorts Auto Suspensions Products
19.	Everest Industries
20.	Wipro Ltd.
21.	Hero Honda Motors Ltd (Daruhara)
22.	Hero Honda Motors Ltd (Gurgaon)
23.	Honda Scooters & Motorcycles India Pvt. Ltd.
24.	Vishakhapatnam Port Trust
25.	Bhushan Power & Steel Ltd. (Kolkatta)
26.	Birla Tyres (Haridwar)
27.	Bharat Heavy Plate & Vessels Ltd.
28.	Century Well Roofing India Pvt. Ltd
29.	CPWD Delhi
30.	IGI Airport Delhi
31.	Mahindra & Mahindra (Punjab Tractor Ltd. Mohali)
32.	National Thermal Power Corp.
33.	McNally Bharat Engineering Company Ltd.
34.	Metecno India Pvt. Ltd.
35.	Rail Coach Factory Kapurthala
36.	Reynolt Nission - Chennai
37.	Tata Pasco Motors
38.	Rohan Builder India Pvt. Ltd
39.	Reliance Industry
40.	M.G. Industries
41.	Mafatlal Denim Limited,
42.	Century Pulp and Paper
43.	Micro Turner
44.	Multicolor Steels Pvt. Ltd.
45.	Ramky Infrastructure Ltd
46.	OM Logistics Ltd.
47.	P.C Colour Steels India Ltd.
48.	Pam Builders Pvt. Ltd.
49.	Tiger Steel Engineering India Pvt. Ltd.
50.	Patanjali Ayurved Ltd.

S. No.	Our Clients & End User Clients
51.	Lloyd Insulation India Ltd. (Delhi)
52.	Lloyd Insulation India Ltd. (Kolkatta)
53.	Lloyd Insulation India Ltd. (Mumbai)
54.	Lloyd Insulation India Pvt. Ltd.
55.	JKS Infrastructure
56.	Ahluwalia contracts India Ltd.
57.	Roca Bathroom Products Private Ltd.
58.	Rajasthan Textile Mill
59.	SMCC Construction India Ltd.
60.	Spectec Building Products Pvt. Ltd.
61.	Sujlon Energy-Coimbatore
62.	Supertech India Pvt. Ltd.
63.	Steel Strips Wheels Ltd.
64.	K.R. Pulp & Papers Ltd.
65.	Unicon Building Systems
66.	Unimet Profile Pvt. Ltd.
67.	Vardhman Industries Ltd.
68.	VXL Technology
69.	Vallabh Textile Ludhiana
70.	Videocon Industries
71.	Jindal Stainless Steel India Ltd.
72.	Bajaj Auto Ltd.
73.	Euro Container Ltd.
74.	Caparo Fastner
75.	Prestar Infrastructure Private Ltd.
76.	Petron Civil Engineers Private Ltd.
77.	IOCL Bathinda Refinery
78.	Modern Steel Ltd.
79.	Doshion Veolla Water Solution Pvt. Ltd.
80.	Globe Civil Project Pvt. Ltd.
81.	Khanna Paper Mill Ltd.
82.	Power Grid Corporation of India Ltd.
83.	Neel Metal Product Ltd.
84.	Jai Bharat Maruti
85.	Nahar Spinning Mill
86.	Hindustan National Glass and Industries
87.	Kejriwal Casting Ltd.
88.	Kohinoor Rice Mill
89.	Integral University Lucknow
90.	Empire Home Appliances Ltd.
91.	Alchemist Metal Ltd.
92.	YKM Botteling Company Pvt. Ltd.
93.	Sunbeam Auto Industry
94.	Mark Exhaust (System Limited)
95.	Blue Dart Express Ltd.
96.	A. Infrastructure Ltd.
97.	Jindal Metecno India Ltd.
98.	Amtech Esters Pvt. Ltd.
99.	Ashai India Glass Ltd.
100.	ISGEC Yamuna Nagar
101.	Auto Meters Pvt. Ltd.
102.	Avery Cycle Industrial Ltd.
103.	Amtek Auto Ltd.
104.	Alps Industries -Meerut
105.	Interarch Building Products Pvt. Ltd.
106.	Ashok Leyland
107.	G.S. Developer & Contracts Pvt. Ltd.
108.	JCB India Ltd.

VENDOR APPROVALS

Company	Vendor Code
Reliance	368869
Larsen & Toubro Ltd.	S8000703
NTPC Ltd.	1010152
Bharat Dynamics Ltd.	1256
Durgapur Steel Plant	1000043565
Kirby Building Systems India Ltd.	60001054
Goodyear	136394
Gopalpur Ports Ltd.	GPL/PUR/VRN.2010-11/035/001
Roca Bathroom Products Pvt. Ltd.	337346
JSL Stainless Steel	20108070
Everest Industries Ltd.	080756
Mahindra & Mahindra Ltd.	DSS6161A
Hindustan National Glass & Industries Ltd.	50001234
Bharat Heavy Plate & Vessels Ltd.	S-6039
ISGEC	IS867
ONGC	853908
Neel Metal Products Ltd.	VSS036
Khanna Paper Mills Ltd.	4364
Unity Infra Projects Ltd.	12455
Tecpro Systems Ltd.	S427
Nahar Spinning Mill Manideep Bhopal	604615

TEST REPORTS



SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH
 (A unit of Shriram Scientific and Industrial Research Foundation)
 An ISO - 9001:2000 Certified Institute

000088381

TEST CERTIFICATE

Issued to :
 SHIV SHAKTI FIBRE UDYOG
 PLOT NO.1G, NORTHERN INDIA COMPLEX
 20/3 MATHURA ROAD
 FARIDABAD - ,HARYANA

Kind Attn: MR.VIPIN DUDEJA , MANAGER SALES & MKT

Sample Particulars:
 One Sample described as "FRP sheet" was received.
 "The sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on declaration by the party".

J.O.No. 805-141-0501
Reg.No. 1174494
Date 23-05-2008
 GC-01 (REV-04)

Your Ref.No. -

Date

TEST RESULTS

<u>S.No.</u>	<u>Test</u>	<u>Result</u>	<u>Protocol Adopted</u>
1.	Young's Modulus, MPa	8190	As per guidelines of ASTM D 638-03
2.	Yield Strength, MPa	129	As per guidelines of ASTM D 638-03

DOR: 07.05.2008
 DOC: 23.05.2008



Signature
 AUTHORISED SIGNATORY
 (EMPLOYEE CODE: 509)

19, University Road, Delhi - 110007.
 E-Mail: qad@shriraminstitute.org Website: <http://www.shriraminstitute.org>

Ph: 91-11-27667267, 27667983, 27667860
 Fax: 91-11-27667676, 27667207



DELHI TEST HOUSE®

A-62/3, G.T. Karnal Road, Industrial Area, Opp. Hans Cinema, Azadpur, Delhi-110 033 (INDIA)
Phone : +91-11-47075555 (30 Lines) Fax : +91-11-47075550
e-mail : info@delhistesthouse.com



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S/R mines

QR-0302

Issued to: **The Director**
McNally Bharat Engineering Co. Limited
C/O Shiv Shakti Fibre Udyog Vide

Report No : **25665100901GEN.3310**
Date : **14-09-2010**
Date of Receipt : **01-09-2010**
Party Ref No : **NIL**

Sample Description:-**FRP SHEET**

Marks:- **JOB NUMBER -8105930089/10007810 DT.31.08.2010**

TEST REPORT

Sl.no	Tests	Test Values	Test Method	Requirement IS:12866-89,AMD.NO.1,REAF.2003
1	Water Absorption, %	: 0.19	IS:12866	0.3 Max
2	Glass Content,%	: 33.9	IS:12866-89,AMD. NO. 1	30 Min.
3	Bolt Shear Test,N (A) Mean (Arithmetic)	: 400	IS:12866-89,AMD. NO. 1	375 Min
4	Bolt Shear Test,N (B) Minimum Individual	: 290	IS:12866-89,AMD. NO. 1	250 Min
5	Barcoal Hardness (% Of Initial Value)	: 22	IS:12866-89,AMD. NO. 1	30 Max.
6	Density, Kg/ Sq.M	: 3.46	IS:12866-89,AMD. NO. 1	-

Remarks: **THE SAMPLE CONFORMS TO VARIOUS REQUIREMENTS TESTED AS PER IS:12866-89 AMD NO.-1, EXCEPT TEST SL. NO.6 AS NO REQUIREMENTS HAS BEEN SPECIFIED IN IS:12866-89 FOR THICKNESS OTHER THAN 1.10MM THICK SHEET.**

Any deviation from the Standard Test Method / Specification - Nil
SUS-GEE-105665-JYO-882010091686 dos/doc 03-SEP-10-14-SEI

[Signature]
Authorised Signatory

सेन्ट्रल इंस्टिट्यूट ऑफ प्लास्टिक्स
इंजीनियरिंग एण्ड टेकनॉलाजी
(रसायन एवं उर्वरक मंत्रालय, भारत सरकार)
मुख्यालय, गिण्डी, चेन्नै - 600 032.
फोन : 22254701 - 06 तार : सिपेट
फैक्स : 91 - 44 - 22254707



**CENTRAL INSTITUTE OF PLASTICS
ENGINEERING & TECHNOLOGY**

(Ministry of Chemicals & Fertilizers, Govt of India)

Guindy, Chennai - 600 032. India.
Tel : 22254701-06 Grams : CIPET
Fax : 91 - 44 - 22254707
E-mail : cipetchn@eth.net
Website : www.cipet.gov.in

**परीक्षण प्रमाणपत्र
TEST CERTIFICATE**

Sl. No. 5876

को जारी / Issued to :

M/s. Shiv Shakti Fibre Udyog,
Plot No. 1G, Northem India Complex.,
20/3, Mathura Road,
Faridabad (Haryana) India.

दिनांक / Date :

27th March, 2009

संदर्भ / Ref. :

Test Duration: 23.03.09 to 27.03.09
Dt 23.03.09

मानक स्तर के अनुसार परीक्षण रिपोर्ट

TEST REPORT AS PER STANDARD :

30316

रिपोर्ट सं / REPORT NO. :

भाग - क / PART - A

प्रस्तुत सैंपिल का विवरण / PARTICULARS OF SAMPLE SUBMITTED

Sample of Fibre Reinforced Plastic Sheets
- as stated by the party

अ) सैंपिल का नाम	:	Not applicable
a) Name of the Sample	:	Not applicable
आ) ग्रेड/प्रकार/आकार/वर्ग	:	Not applicable
b) Grade / variety / type / size / class	:	Not applicable
इ) घोषित मूल्य	:	Not applicable
c) Declared value, if any	:	Not applicable
ई) कोड सं.	:	Not applicable
d) Code No.	:	Not applicable
उ) बैच सं. एवं निर्माण तारीख	:	Not applicable
e) Batch No. and Date of Manufacture	:	Not applicable
ऊ) मात्रा	:	2 Nos
f) Quantity	:	As per standard
ए) पैकिंग की रीति	:	Not Packed
g) Mode of Packing	:	Not Packed
ए) मोहर बंद या नहीं	:	Not Sealed
h) Sealed or not	:	Not Sealed
आ) कोई अन्य सूचना	:	--
i) Any other information	:	--

[Signature]
27/3/09

1 of 4

5301 to 6300 / AVP / 29-12-08

5301 to 6300 / AVP / 29-12-08

ISO CERTIFIED COMPANY



Certificate Number:

50336

This is to certify that the Quality Management System of:

SHIV SHAKTI FIBRE UDYOG

of

Kila No. 71/8/1/1, Village Hasangarh, Tehsil-Sampla, Distt. Rohtak, Faridabad,
Haryana, Indiahas been assessed and registered by ACS Registrars Ltd. against the following
Quality Assurance Standard:**ISO 9001:2008**

The scope of registration is detailed as indicated below:

"Manufacture and Supply of Fibre Glass, Reinforced Plastics (FRP),
Polycarbonate & Roofing"

Signed by:

Date of initial assessment: 10/03/2009
Date of registration: 28/03/2009
Date reissued: n/a
Date of expiry: 09/03/2012*

Whilst all due care and skill was exercised in carrying out this assessment, ACS Registrars Ltd. accepts responsibility only for proven gross negligence. This is not a legal document and cannot be used as such. This certificate remains the property of ACS Registrars Ltd. to whom it must be returned upon request. *Certificate validity may be verified at the address below.

Head Office:
ACS Registrars Ltd.
International House, 178 Reddip Heath Road, Sutton Coldfield, West Midlands
B75 7ET. UK
Tel. 0121-241-2299 Fax. 0121-241-4623
www.acsregistrars.com