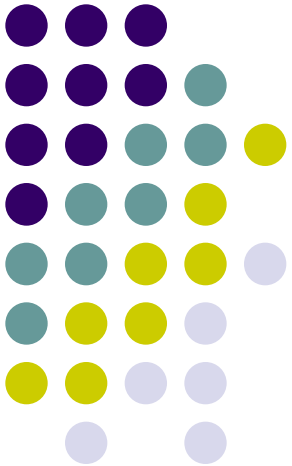
FRP Cable Trays & Other FRP Products

Presentation by Sintex Industries Ltd



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SINTEX
ACTIVE THINKING

The Sintex Group

….. a brief introduction

…….An Indigenous MNC

- **Formerly Known as "The Bharat Vijay Mills" (BVM)**
  - Textiles Division: 1931
  - Plastics Division : 1975
  - Turnover of Rs.2500 Cr. With CAGR 35%
  - 13 different manufacturing processes – *in* THERMOPLASTICS, THERMOSETS, PREFABS, POST-MOLDING, PAINTING etc.

Products for -	
Building & Construction	Electrical & Energy
Telecom	Waste Management
Material Handling & Logistics	Automotive
Mass Housing	Prefabricated Buildings

- **Acquired 5 Companies - - 2 in USA, 1 in France, 1 in Germany and 2 in India.**
- ***Unlimited and Expanding Capabilities***

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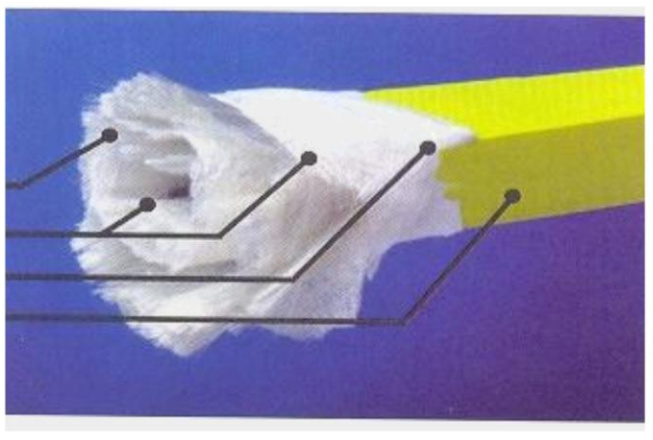
What is FRP?

- Fiberglass Reinforced Plastic
- Fiber :- Glass, Carbon, Aramid Etc.
- Plastic:- Unsaturated Polyester Resin, Venlyester Resin, Phenolic Resin, Etc.
- Fibers are load members

  &
- Plastic surrounds them so as to hold together as well as protect fiber from environmental & external physical damages
- Analogy Reinforced cement concrete
  - Reinforcing Bars = Fibers
  - Concrete Mix = Plastic



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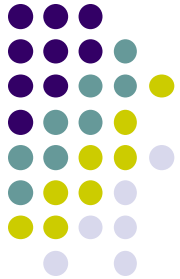
Details of Manufacturing Process - for FRP items



Process		Products
Manual Labor intensive	Hand Lay-up & Spray up	Garden furniture, decorative dustbins and roofs, canopies etc.
	LRTM	Manhole Cover, FRP Tank Lid
Automatic Mechanized Consistent quality	Compression Molding (SMC)	Electrical enclosure, Automobile cover, V Cross arm, Sign Plates, Chequered Plate
	Pultrusion	Cable Tray, Grating, Structural profiles, Sign Post, Cable Duct
	Filament Winding (Chopped)	FRP Underground Tank, FRP Petroleum Tank

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We have all above mentioned FRP Process Facility

FRP Manufacturing Porcess

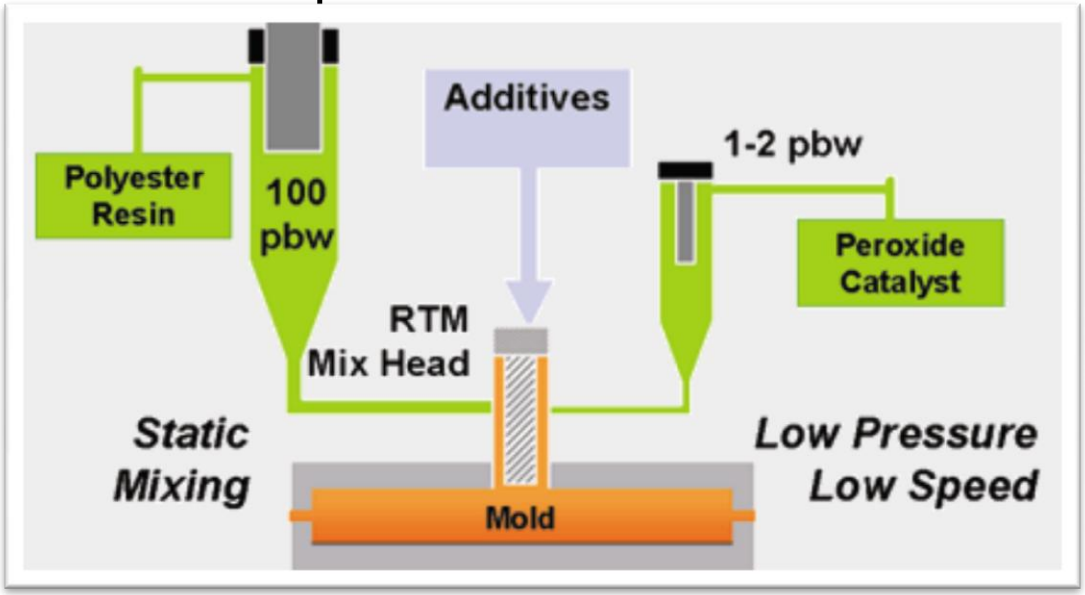
Hand Lay-up & Spray up

- **Hand Lay-up:** The oldest and simplest molding technique in which reinforcing materials and catalyzed resin are laid into or over a mold by hand. These materials are then compressed with a roller to eliminate entrapped air.

- **Spray up:** Covers a number of techniques in which a spray gun is used to simultaneously deposit fiberglass and catalyzed resin on a mold.

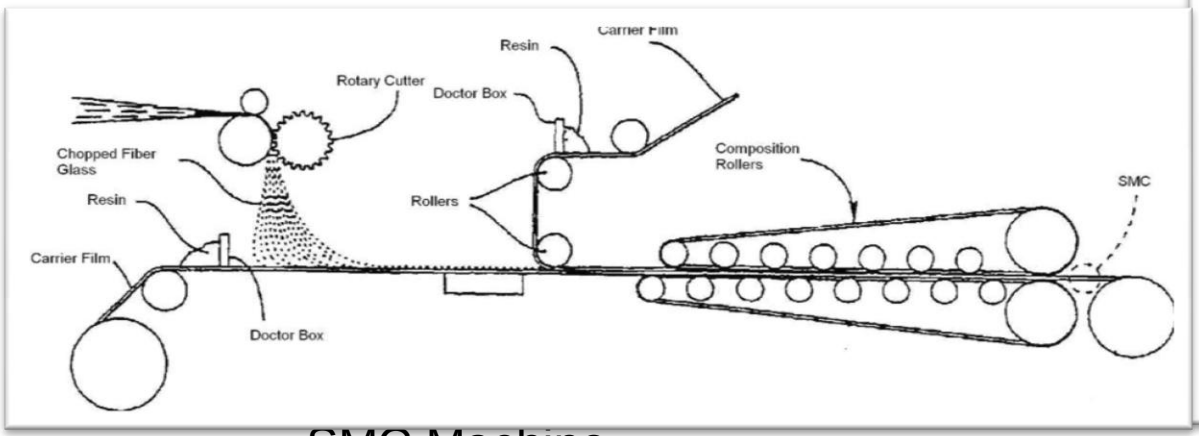
LRTM

- **Low Pressure Resin transfer molding (LRTM)** is a low pressure closed molding process for moderate volume production quantities.
- Continuous strand mats and woven reinforcement is laid up dry in the bottom mold half. The mold is closed and clamped, and catalyzed resin is pumped in, displacing the air through strategically located vents. Metered mixing equipment is used to control resin/catalyst ratios that are injected into the mold port.

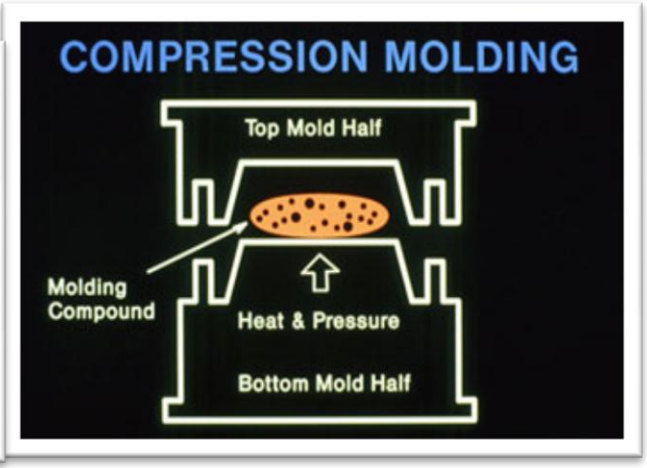


Compression Molding

- Compression molding is a method of molding in which the molding material is placed in an open, heated mold cavity. The mold is closed with a top force and pressure is applied to force the material to contact with all mold areas, while heat and pressure are maintained until the molding material has cured.
- **Sheet molding compound** (**SMC**) is a ready to mould fibre-reinforced polyester material primarily used in compression molding.



SMC Machine



Molding Press

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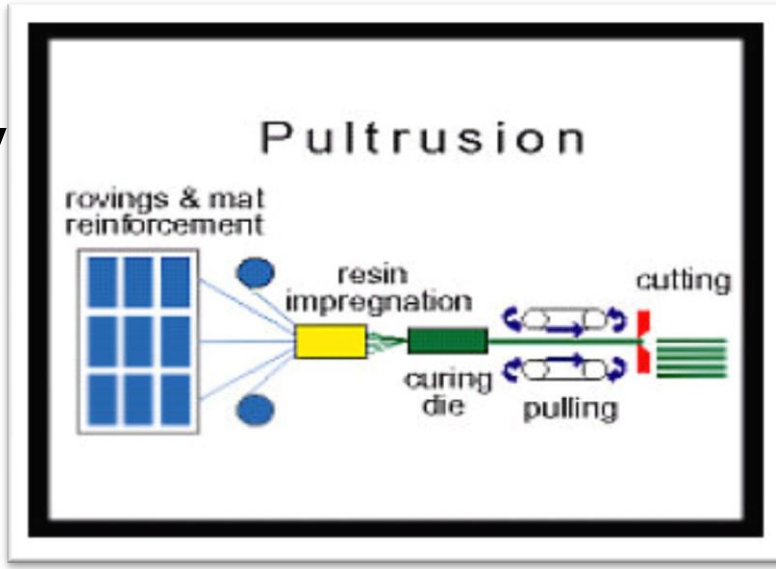
Pultrusion

- Pultrusion is a continuous process of manufacturing of composite materials with constant cross-section whereby reinforced fibers (continuous) are pulled through a resin, and into a heated die, where the resin undergoes polymerization.
- Advantages
  - Continuous Length capability
  - Consistent Quality
  - High Axial Strength
  - Dimensionally Accurate



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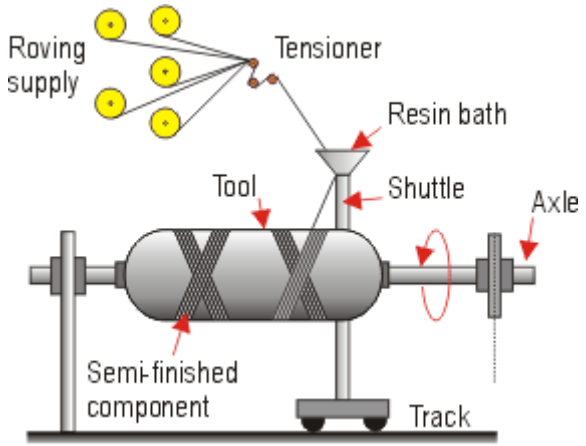
Filament Winding

- High speed precise laying down of resin impregnated continuous fibres onto a mandrel is the basis of the filament winding process
- Advantages:
  - High strength
  - Best for underground applications



FRP Advantages / Unique Features

1)	Corrossion Resistant
2)	Chemical Resistant
3)	Excellent Weatherability, UV Stabilized
4)	Fire Retardant as per IS-6746
5)	High Load Bearing Capacity- Meets NEMA/EIL Norms
6)	Maintenance Free
7)	Low Conductive to Heat and Electricity
8)	EMI Transparent - Transparent to Electromagnetic radiations unlike GI and Aluminum Trays
9)	Easy to Install (Due to Light Weight)

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Advantages of FRP over Metals

1)	Resistance to Corrosion contributed to Reduction in Life Cycle Cost
2)	No requirement for Electric Continuity Test
3)	No Earthing required
4)	Does not deform under Impact
5)	Excellent Electrical and Thermal Insulation
6)	No Finishing requirement and No risk of Injury
7)	Easy to work (cut, drill) at site and is much easier to move and place (light weight)
8)	Resistant to Saline Water, Sulphur, Chlorine and other basic Environments
9)	

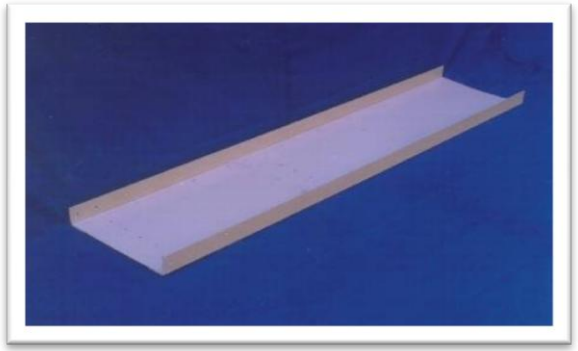
SINTEX FRP Products for Reliance

Sintex FRP Cable Trays

- Ladder Type
- Ladder Type (Molded Rung)
- Channel Type

Ladder Type Cable Tray

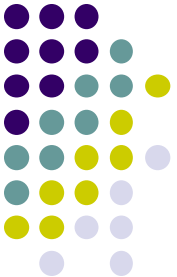
Cooling Tower @ IOCL Baroda



Channel Type Cable Tray

Ladder Type Cable Tray (Moulded Rung)

Sintex FRP Cable Trays



- Compliance to EIL / NEMA /ONGC Specification
- Spacing between Rungs typical 300 mm c/c
- Inverted lipped rungs for zero damage to cables & convenient cable dressing
- Loading approx 160 kg/SQMT (as per EIL) @ support span 2 /3 Meter
- Cable tray Complies to all EIL specified requirements and FRP as per IS-6746 with UV resistance, Fire Retardency and Antistatic properties in line with Specifications.
- Ladder type cable trays upto 1200 mm width
- Channel type cable trays upto 600 mm width approx 25 different sizes
- Approved Vendor @ EIL, ONGC, HPCL, HMEL, BPCL, Reliance Infrastructure, etc …...

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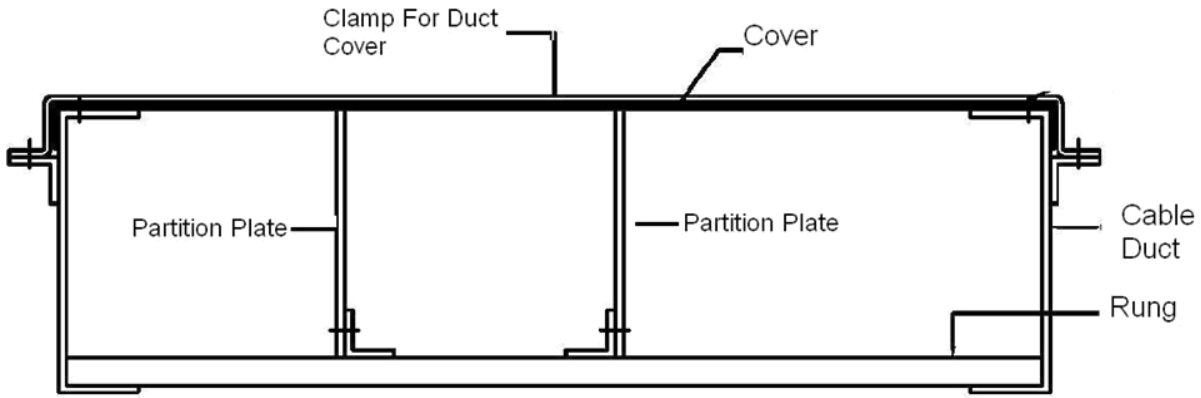
FRP Cable/Pipe Duct

- High Strength ladder type cable duct with sliding type partitions (with facilities to add more later) for laying of Power, control and instrumentation cable simultaneously
- Conforming to EIL standards
- Loading capacity as per EIL



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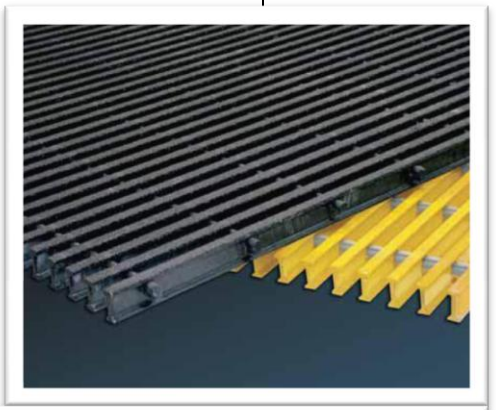
FRP Fencing

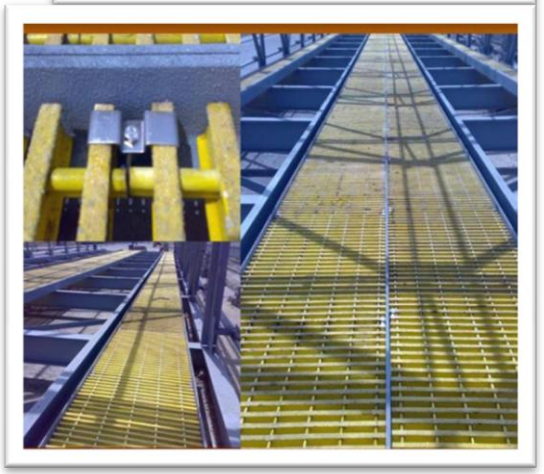
- Safe and Corrosion resistant solution for fencing of transformers and substations
- Unique Features
  - Non Conductive
  - High Strength
  - Non Corrosive
  - Demote Vandalism
  - Pilfer Proof
  - Maintenance free
  - Fire Retardant

Flooring

- FRP Gratings
- Pultruded gratings are fabricated, using Pultruded I-section and Pultruded Rod & Wedge Section.
- Pultruded I-section acts as a bearing member and Rod is used as cross bars.
- Available in two thickness 25, 38 and 40 mm
- 500 kg./Sq.M UDL for span 1 M
- **Features**
  - Anti corrosive
  - High strength
  - Maintenance free,
  - self colored
  - Chemical resistant
  - Slip Resistant
  - Non Magnetic
  - Easy Installation

Stairs at MPSEZ, Mundra

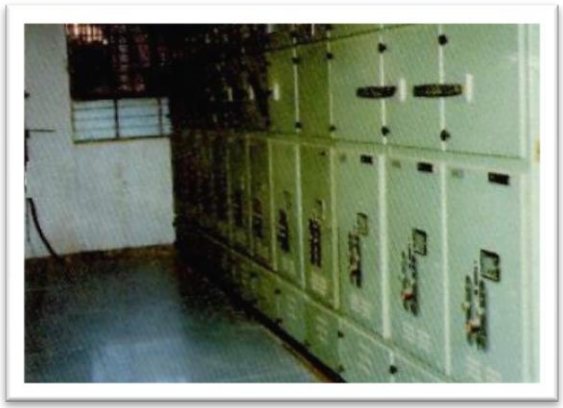


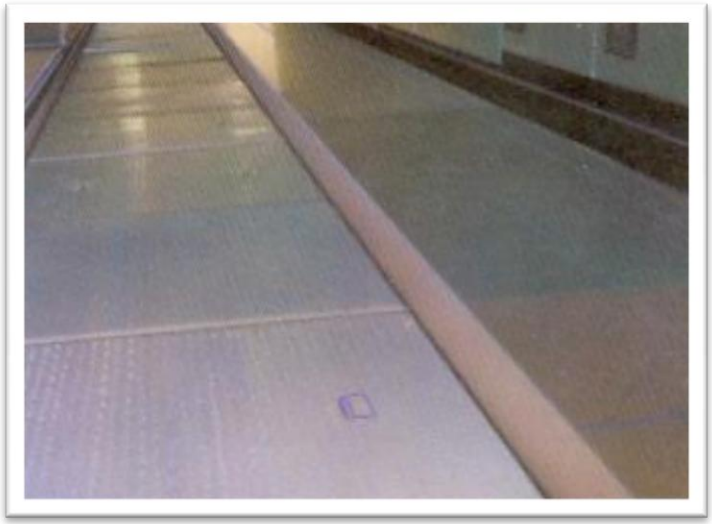


Walk way for conveyer belt at MPSEZ

FRP Chequered Plates

- Hot Press moulded from advanced composite, namely, SMC
- Tested & Approved by CPRI & ERDA
- Unique Features
  - Durable & Resistant to decay
  - Maintenance Free
  - High Di-electric Strength
  - High life Expectancy
  - Anti Corrosive
  - Can Withstand load of breaker trolleys
  - Easy to Fix on Floor
  - Permanent fixing to Floor
- Range: 2.5mm to 10mm Thickness





Other FRP Products

- FRP Ladders
  - Single/ Expandable/Step Type Ladders
  - Strong and Light Weight
  - Confirming to OSHA, ANSI-A 14.5 CL-7.10.1 & CL-7.10.2

- Enclosures
  - Shock proof, Pilfer proof, Corrosion resistant solution for electrical enclosures.
  - Distribution Box, Junction box, Fidder Pillar

Major Clientele for FRP Cable Trays

(Partial)

- Approved Vendor/supplier @
  - EIL
  - Jacobs
  - Toyo
  - UHDE
  - HPCL
  - HMPL
  - HMEL
  - BPCL
  - MRPL
  - CPCL
  - IOPPL
  - ONGC

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Stringent & Streamlined QA systems

U. T. M.

HDT/VSP Tester

Arc Resistance Tester

Earthing Tester

Izod Impact Tester

C.T.I.Tester

Glow Wire Tester

Heat Deflection Tester

High Voltage Tester

…Comprehensive Testing Facilities

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Thank You

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Innovation for a Better Tomorrow..