

India Can Innovate

Gordon Rodricks

History

History has on record a significant list of innovations and inventions of Indian origin dating back from prehistoric times.

From Buttons and Bangles over 2500 years ago, to Lake Reservoirs, to Iron metal, to the computer friendly USB and Optical Glass Fibres were the range of simple to sophisticated inventions credited to Indians, which impacted International life conditions significantly.

About Fibreglass - In 1893, Edward Drummond Libbey exhibited a dress at the World's Columbian Exposition incorporating glass fibres with the diameter and texture of silk fibres. But what is commonly known as "fibreglass" today, was invented in 1938 by Russell Games Slayter of Owens-Corning, as a material to be used as thermal insulation.

The concept of a high strength fibre as reinforcement for resins followed and Fibreglass gave rise to the first modern composites, and is still the most commonly used reinforcement. It makes



Bar Stools Dubai with Phantom Veil



Ceiling Rafters with Phantom Veil

up about 65 % of all the composite materials produced today.

The concept of a basic glass fibre was worked on developed and further innovated over the years to represent what today is an established Industry spanning the entire globe.

The Fibreglass Industry has always been regarded as one oriented to such intense end uses as Defence, Space, Wind Energy, Electronics and the likes. But Building Interiors and Exteriors are no mean outlets for FRP in its many forms and end applications, and it is in these fields that an image change was needed so as to perceive FRP as more than an intense industrial basic raw material.

Development

With this vision was conceived the concept of giving Fibreglass a 'glamorous' facelift. And so was born "PHANTOM VEIL" Fibreglass Design Textures. Genetically "PHANTOM VEIL" is based on Surfacing Mat - an unsung hero in the FRP Industry since its inception.

Surfacing mat/veil is known for its property to mask the untidy under layers of CSM, Woven Rovings and the likes. It is also used to provide a resin rich surface finish for chemical resistant contact surfaces of FRP. Later it performed an added function of lubricating metal dies, as in the Pultrusion process.

But what else could a surfacing veil do ? Could it not also clothe the FRP moulding ? Could it not also 'dress- it- up' ? Could it not also glamorize it ? Yes of course and how? By adding Colour, Design, Asthetics, Texture and ultimately

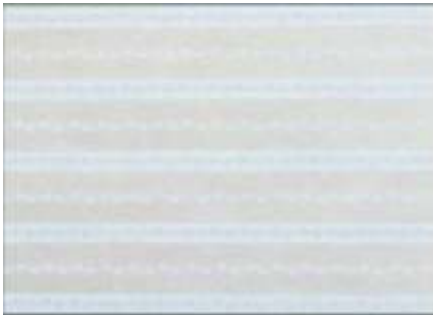


Feature

Etched glass textures



SNOW STORM



FLORO LACE

Personality to the FRP product. Simple once it is conceived? There is more to follow but this then is "PHANTOM VEIL" a revolutionary innovation, invented specifically for this purpose.

Then commenced the technical identification of the basic Fiberglass Veil in terms of fibre Diameter, Directional fibre 'lay', fibre Distribution and mat/veil Density. All these properties were



Pultruded Sections with Phantom Veil 1



Pergola Arch with Phantom Veil Dubai

carefully investigated and standardized after being tested and proven.

Next followed identification of a suitable size-binder to enable the mat/veil to pick up and retain selected Pigments chemically. Remember glass fibres by themselves are non absorbent.

The investigation of available Pigment compositions and machine printing capability followed, as a precaution to proper chemical bonding of the pigment with the mat/veil. This would ensure that the selected pigments would also be non reactive, and more so, compatible with the Polyester/Epoxy resin systems.

Tests and evaluation on UV stability, resistance to Ageing and exposure to Weathering were all essential prerequisites.

And finally, and most importantly was the ability for "PHANTOM VEIL" to conform to mould contours and complex curvatures relating to the end uses for which it was developed. This had to be achieved coupled with a lay up technique and a laminating sequence directed at eliminating air bubbles, folds, wrinkles and other blemishes in Hand-lay-up moulding for which "PHANTOM VEIL" was primarily directed at initially.

All these complex stages culminated in the birth of "PHANTOM VEIL" - Fibreglass Designed Textures.

Industrial textures



DARKOWEAVE 360

Definition and Introduction

The word Phantom defines its see-through ghost like characteristic which becomes a reality with the right back-up pigment in the final FRP moulding.

The initial awe with which the product was perceived by the market was laced with a subjective reluctance to be the first to use it, by some doubting 'thomases'. But as is usually the case, it is the brave adventurous who end up as pioneering leaders, and so it has been with this product, for which Advance FRP Mumbai-- Door manufacturers and Lancer Nashik Maharashtra Antiquated furniture, led the fray and today have even transferred Technology to foreign counterparts for the incorporation of "PHANTOM VEIL" in the vast range of doors and other interior and exterior items which have been in use without the slightest degradation since over 5 years. The test of success of this product now is the ever increasing number following in the footsteps of these pioneers and now flocking to use "PHANTOM VEIL" internationally.

Decorative Textures



SHADOW GRASS

BAMBOO



BRICK WALL

Feature

Fibreglass "Phantom Veil" Specifications Range		
Weight (Mass)-gms/m ²	32.00	41.00
Breaking Strength-N		
Warp	29.00	35.00
Weft	12.00	25.00
Elongation At Break %		
Warp	0.75	1.10
Weft	0.80	1.08
Trapezoidal Tear Strength-N		
Warp	4.00	5.00
Weft	3.50	5.25
Air Permeability (At 10mm WG)	>156	
Stiffness - cms		
Warp	6.50	7.25
Weft	5.30	6.15
Thickness - mm	0.19	0.21
Porosity - μ	>250	

Specifications-Fibreglass

Let us take a birds eye view at the essential properties of Fibreglass "PHANTOM VEIL" :

Fibreglass "PHANTOM VEIL" displays similar laminating properties as Fibreglass Surfacing Mat. It has been used extensively since its Invention 7 years ago, for Hand-Lay-up and Spray-Up Moulding Processes. The pigments are compatible with the binder of the basic

mat as well as with Polyester and Epoxy Resins. Glass to resin ratios can be varied from 1:6 to 1:10.

Evolution Of Polyester "Phantom Veil"

With the standardization of the product for Hand-lay-up, and Spray-up moulding techniques, it was now necessary to look ahead, and sights were focused on the incorporation of "PHANTOM VEIL" for

machine moulding processes namely PULTRUSION to start with. For Pultrusion Polyester mat/veil was preferred due the need for greater extensibility and elongation during the machine 'pulling'.

Similar development stages were explored before introducing Polyester "PHANTOM VEIL" for Pultrusion. This is a highly successful diversification which has already established itself internationally and shows signs of growing into bigger markets.

Polyester "Phantom Veil" is processed from a non woven polyester continuous filament mat.

The basic veil is an advanced non-woven spun bonded fabric. The fibres are thermal bonded without a binder.

Polyester based "Phantom Veil" is specially developed for Pultrusion, for which it imparts a smooth designed surface finish to the pultruded section and also helps prolong the life of Die, serving as a friction reducing agent.

Low moisture pick-up of 0.5% @ 98% relative humidity.



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* Chopped strand mat * Chopped strands (DMC, Phenolic & WD grade) * Rovings * Yarn * Woven roving * Plain & printed surface mat * Cobalt octate
 * Combination mat for LRTM * Kromatik pigment pastes for polyester moulding, Epoxy potting, Flooring & Polyurathene foam * PVA, Aerosil, Rollers * MEKP, TBPB, TBHP
 * Polyester resins & gelcoats , * Sika adhesives & sealant * FINOLEX PVC rigid sheets for anti-corrosive application, foam sheets & roofing sheets * Reliance recron 3s fibers...etc.

◀◀ WE PROMOTE ▶▶





















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Specifications Polyester

Polyester Phantom Veil Specification - Range		
Weight (MASS)gms/m ²	46.50	52.00
Breaking Strengths N		
Warp	108.00	112.00
Weft	60.00	65.50
Elongation at Break %		
Warp	14.00	15.00
Weft	14.30	16.00
Trapezoidal Tear Strength-N		
Warp	16.20	20.00
Weft	13.00	16.00
Air Permeability (At 10mm WG)	87.00	130.00
Stiffness cms		
Warp	6.00	6.25
Weft	4.45	4.74
Thickness mm	0.18	0.19
Porosity - μ	39.50	98.80

Physical properties are retained even when wet.

Dimensionally stable but having adequate elongation to assist Pulling Loads and Machine Moulding pressures.

Chemically resistant to oils and solvents.

Melts and shrinks away from an exposed flame or high heat source before reaching ignition temperature of 480°C.

It completely combusted it decomposes into H₂O and CO₂.

Usages and end Applications:

Fibreglass / Polyester "Phantom Veil" Design Textures developed by FRP Accessories has opened up an entirely new perspective for surface finishes in Fibreglass Reinforced Plastics for the following popular end applications identified; some are already in use:

- Doors, Windows •Partitions, Roofing Sheets, Panels, Ceiling Boards and Translucent Ceiling Panels
- Casings for Water Coolers, Desert Coolers, Washing Machines • FRP Cladding for Pillars, Building Exteriors
- Furniture, Cupboards & Cabinets, T.V. Cabinets • Tubelight - Translucent Decorative Diffuser Covers
- Banisters & Railings • Interior Cabin Skirtings, Wall Dividers, Cornices

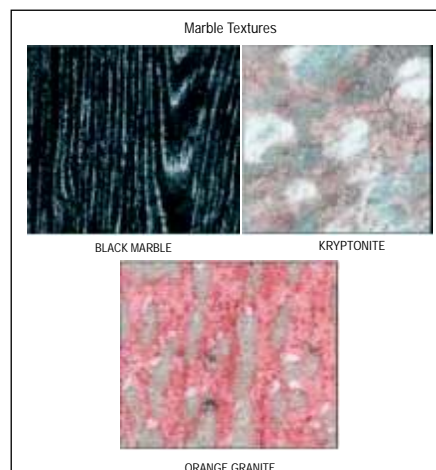
- Defense items: Helmets, Boat Exteriors, Vehicle parts, High Altitude Huts & Shelters, Trench Covers, Mobile Hospitals
- Sign Boards • Marble Type Slabs & Sheets - The resemblance to marble opens wide application possibilities.
- Customised Brand labels / logos to be incorporated in FRP Moulded Products particularly Pipes.

Pultruded Sections

Looking Ahead

It is easy to prepare lists but if the points about quality, creativity and aesthetics are ignored these lists become only academic. Nonetheless think also of

- a) Defense Cabins, Sentry Posts, and Portable Shelters use Phantom Veil for additional camouflage finishes. B) In Japan known for its progressiveness, complete assembled and fabricated units have become the order of the day in buildings and in railway compartments as well. These include shower trays, wash basins, chamber pots, bath tubs, complete and fitted with internal plumbing, so that fitting becomes a matter of a few hours for each unit.
- c) Look at Building Facades, Windows, Covered Shopping Arcades, Door and Window surrounds. d) Look at stadium seating so many cricket and sports stadiums sweeping the country.
- e) Look at Garden and Children's play



equipment slides, swings, roundabouts.
 f) Look at the number of Malls coming up. Ever thought of the diverse possibilities for FRP with Phantom Veil?
 g) Look at Multiplexes. Round every street corner. h) Domes and dome lights get you ideas from the attached pictures. i) Tinted Panels and False ceilings? J) Wall Paneling with Phantom Veil - Already making inroads into wooden and marble finishes in Five Star building concepts.

International Award

This invention has been acclaimed and acknowledged internationally. In 2008 the Inventors -- FRP Accessories Mumbai was the winner of the ICERP / JEC International Innovation Award for "PHANTOM VEIL". A truly proud achievement.

About  the author

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The author is a regular correspondent for FRP Today with years of experience as All India Marketing and Sales Manager with the erstwhile FPG Ltd and CEAT Ltd