



Arvind

Arvind  
COMPOSITES

## Arvind Composites is a part of Arvind Ltd.

**\$1.4Bn**

Indian conglomerate

Interests in **Textiles, Retail,  
Advanced materials,  
Environmental solutions  
and Real estate**

**Founded in 1931**

during Swadeshi movement

Among **Global top 5**  
organized Denim manufactures and  
**pioneers of Denim in India**

Our fabric can go around the earth  
**~6 times**

**2 pieces every second**  
an Arvind managed brand apparel is  
sold in India

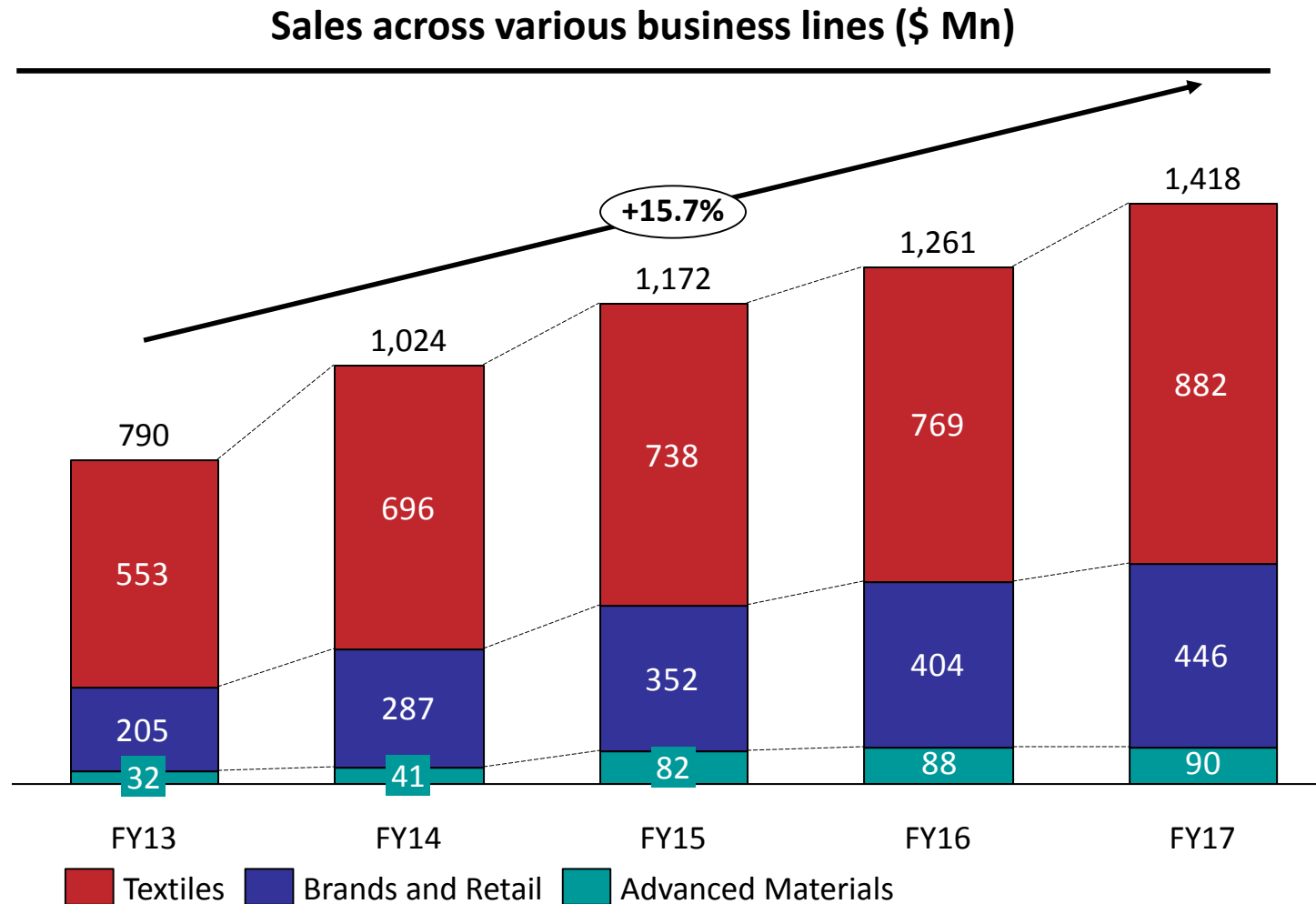
Own or manage  
**15 Global**  
apparel brands in India

**40K hectares**  
of farmland under  
organic cultivation

**Largest**  
Fire Protection Fabric  
Producer in India

**22 global patents**  
for environmental  
solutions

# Arvind's business comes from textiles, brands and retail and advanced materials



# Celebrated history of innovation in products and processes



## Wearable technology

- Smart jacket which can communicate with handhelds

## Immaculate finish

- World's first Non Iron fabric with 4 and above DP rating



## Khadi Denim

- Denim produced in the traditional Indian way



## Recycle Poly

- Polyester made from post consumer PET bottles



## Neo - Corduroy

- Traditional corduroy that fades like Denim

## Ultra Fresh

- Unique stain repellent, Anti microbial, UV deflector and wrinkle free fabric



## Neo - Bubble

- Unique eco-friendly tech. of surface dying that makes fabric wash down like Denim



## All season Coolmax®

- Fabric that keeps wearer cool on hot days and warm on colder days

## Textiles: Relationships with global iconic brands running into decades ...

**BOSS**  
HUGO BOSS

**GAP**

**ck**  
Calvin Klein

**Levi's**

**PVH**

TOMMY HILFIGER

gusho ZARA  
INDITEX  
ZARA HOME  
PULL&BEAR  
Dotti  
INTERQUE

**G-STAR**  
RAW DENIM

**GANT**

**patagonia**

**H&M**

JCPenney  
Every Day Matters

**UNI  
QLO**

EST. 1892  
**Abercrombie  
& Fitch**  
NEW YORK



**M&S**  
COLLECTION

**IZOD**

**ESPRIT**

J. CREW

**Timberland**

**U.S. POLO ASSN.**  
SINCE 1890

BANANA REPUBLIC  
**BR**

**DIESEL**  
FOR SUCCESSFUL LIVING

**UNITED COLORS  
OF BENETTON.**

**Hanes**

**EXPRESS**



# Brands and Retail: Unmatched portfolio of owned and licensed brands and retail formats

## Product Brands (Licensed)



## Retail Brands



## JV Brands



## Product Brands (Owned)



# Advanced Materials Division makes high performance materials, fabrics for diverse applications

1

## Composites – Building Materials and Solutions

### FRP products



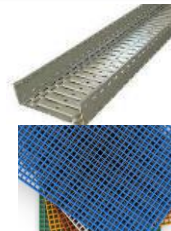
Cooling Tower Profiles



Mass Transport



Wind Blade Reinforcements



Gratings & Cable Trays



Structural Poles

### Glass fabrics



Glass fabrics

2

## Industrial Fabrics – Filtration and Belting

### Industrial Filtration



Woven Media



Non-Woven Media

### Industrial Belting



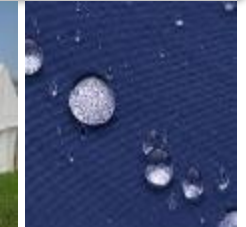
Belt Reinforcement Fabric



### Others



Embossed and Laminated Fabrics



3

## Protective Fabrics and Garments

### FR - Inherent



Protex®



Nomex®

### FR - Treated



Proban®



Pyrovatex®

### Non-FR



Anti-Ballistic



Anti-Static



Abrasion Resistant

## Brief introduction: Arvind Composites

- Arvind Ltd. started its Composites division in 2014 under the overall umbrella of the Advanced Materials Division
  - We are the first and only listed Indian corporate to enter this segment
- Arvind has initially started with structural profiles and hand-laminated products catering to cooling towers and infrastructure customers
- In 3 years, Arvind has quickly scaled up its monthly production to 500T+, largely catering to global cooling towers majors
- Our capacity in pultrusion is 600 MT/month – highest in India, and we offer a full range of solutions for all infrastructure needs including gratings, poles and hand laminated products



# Arvind Composites serves various end segments

## Cooling Tower Profiles



## Building & Construction



## Mass transport



## Wind

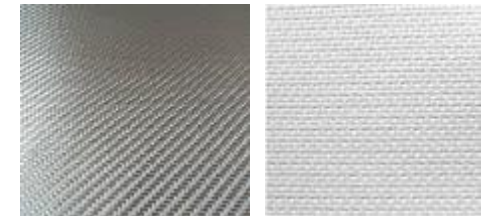


- Wind Blade Reinforcement
- Molded Products

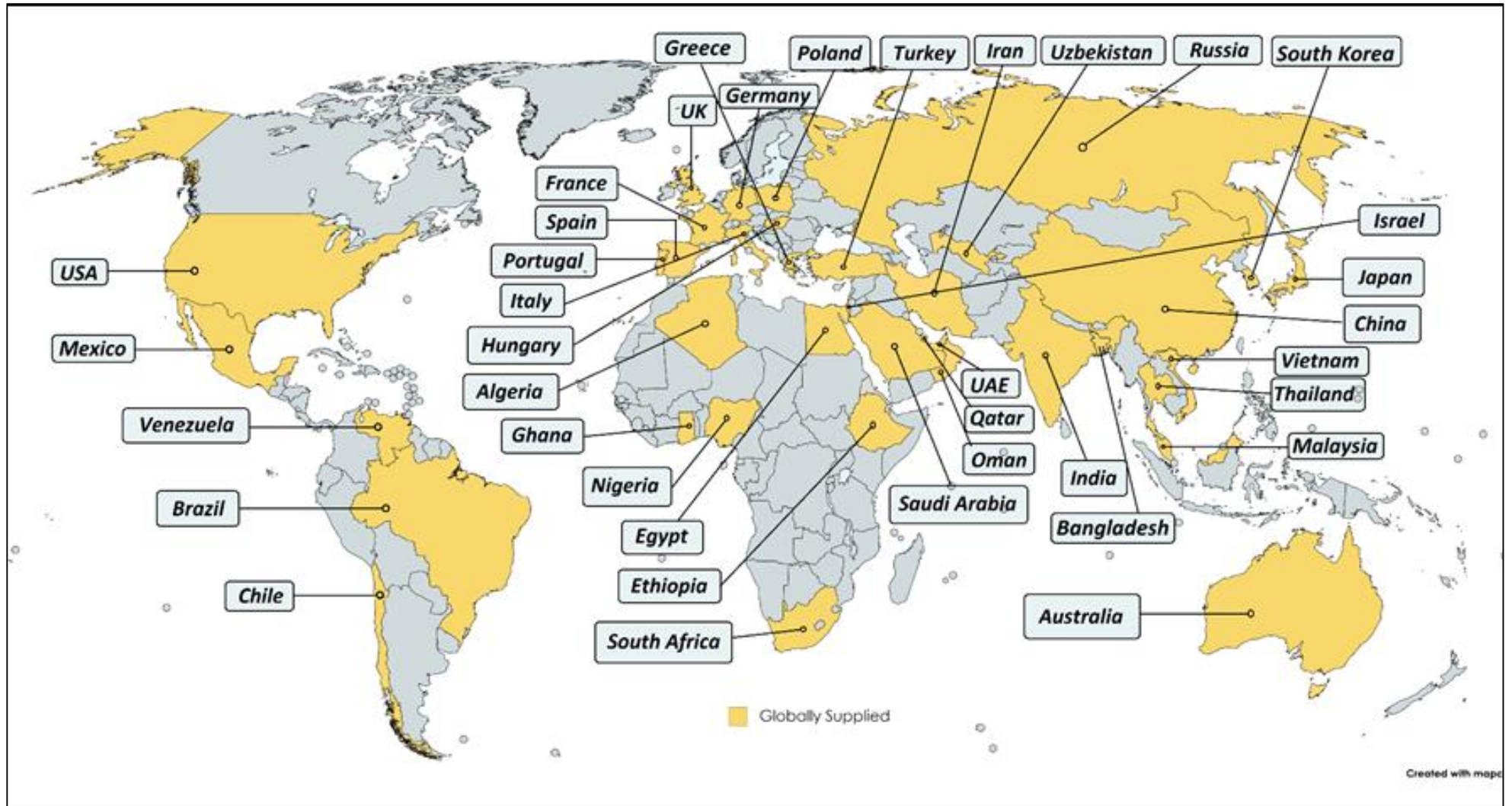
## Industrials



## Glass Fabrics



## Worldwide reach – materials supplied to 40+ countries



# We supply to major global cooling tower OEMs

## Cooling Tower Companies

---

**B&W**  
SPIG

**HAMON**

**SPX**  
COOLING TECHNOLOGIES

**ENEXIO**

**YWCT**  
Custom Cooling Towers

**ICT**  
INTERNATIONAL  
COOLING TOWER

**e**sindus

**INNOVEK**  
Cooling Tower Specialist

**ilmed**  
IMPIANTI

**COOLING TOWER  
DEPOT®**

**PAHARPUR**

**PANWATER**

**COFIMCO**

**cooling  
TORRAVAL**  
product, technology & services  
MITA Group

**MELFRANK ENGINEERS**

**Southern**  
COOLING TOWER

**Southern Cooling Towers Pvt. Ltd.**  
An ISO 9001 : 2008 Organisation

*S.V Cooling Towers Private Limited*



Our customers include major Indian industrial houses and global cos.



## Key capabilities

**28 pultrusion machines capable of producing ~600 Metric Tonne/month**

**300+ skilled manpower for both pultrusion / hand-lamination; access to many more through contracted manpower suppliers**

**Fully equipped mechanical and chemical laboratory for incoming and outgoing material**

**Glass fabric manufacturing facility (in JV with PD Group) with capacity of 500 tons/month**

**Strong design team and own CNC based fabrication facilities**



## Why FRP: FRP has both an excellent strength-to-weight ratio and resistance of corrosion (II)

- Fiberglass is highly resistant to environmental extremes. Fiberglass Reinforced Polymer (FRP) products do not rust and can be manufactured to be resistant to corrosion and abrasion
- When FRP corrosion and abrasion resistant products are equally compared with more conventional products such as metal, wood, and non-reinforced plastics, FRP products have a much longer life
- When exposed to extreme temperatures, salty or humid air, sun (ultraviolet light), or acidic chemicals, FRP products will last longer and perform better than most available alternatives. FRP products can be customized to meet your industry specifications and environmental surface concerns

## In summary...

### Steel rusts...

---



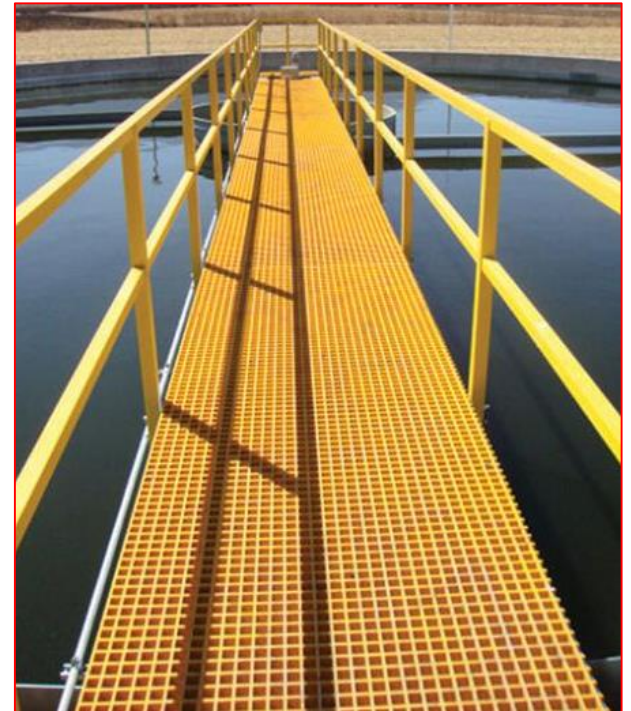
### Wood rots...

---



### FRP lasts

---



# Full range of FRP industrial products at Arvind

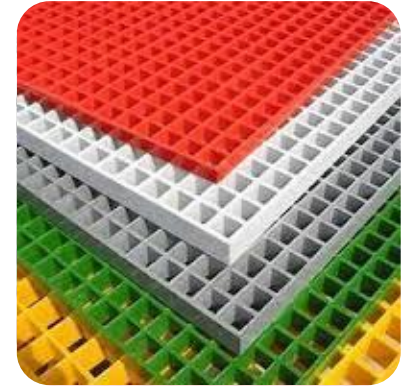
**Cable trays**



**Ladders**



**Gratings**



**Poles**



**Custom solutions**


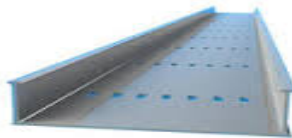



**Structural Profiles**





# Arvind offers a full range of cable-trays

FRP Cable support systems			
Type	Ladder Type	Perforated Type	Solid Bottom
Feature	Made up by assembling C channels and rungs.	Made of C channels with pre drilled holes.	Same as Perforated type but has solid bottom.
Pictorial Representation			
Applications	Suitable for power cables/large cables	Suitable for small loads, instrument or data cables.	Suitable for small cables, instrument cables data cables.
Usage	Power Plants, chemical Plants, large scale industries, high rise and commercial complexes	Telecommunication, for light cable loads, high rise commercial buildings	Telecommunication, for light cable loads, high rise commercial buildings

**Customized cable tray design available based on customer requirements**

# Arvind offers a full range of FRP ladders

**Step ladders**

---



**Extension ladders**

---



**Platform ladders**

---



**Shelf ladders**

---



**Trestle ladders**

---



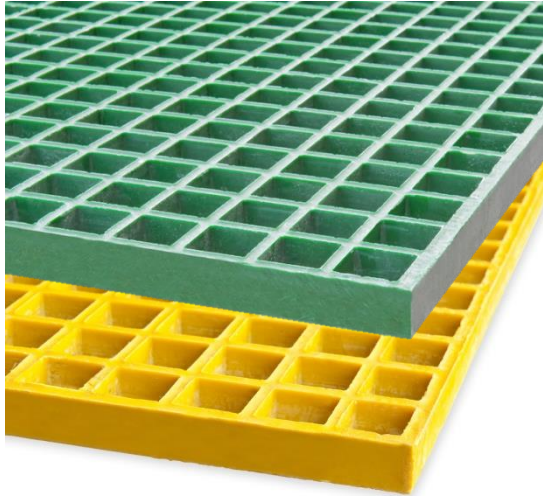
**Wall-supported ladders**

---



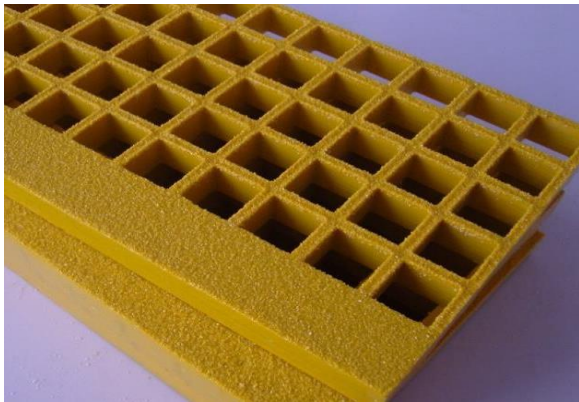


## At Arvind, we offer 38 mm and 30 mm moulded gratings...



**Load table  
for 38 mm  
grating**

Sr.no.	Clear Span(L) in mm	Height of Grating in mm	Mesh size in mm	Deflection as per L/200 in mm	Uniform Distribution Load (Kg/m <sup>2</sup> )	Maximum Recommend ed Load (Kg/m <sup>2</sup> )
1	300	38.1	38.1 X 38.1	1.5	8230	18715
2	400	38.1	38.1 X 38.1	2.0	3490	10480
3	500	38.1	38.1 X 38.1	2.5	2050	6160
4	600	38.1	38.1 X 38.1	3.0	1508	4525
5	700	38.1	38.1 X 38.1	3.5	930	2792
6	800	38.1	38.1 X 38.1	4.0	731	2198
7	900	38.1	38.1 X 38.1	4.5	550	1651
8	1000	38.1	38.1 X 38.1	5.0	405	1216



**Load table  
for 30 mm  
grating**

Sr.no.	Clear Span(L) in mm	Height of Grating in mm	Mesh size in mm	Deflection as per L/200 in mm	Uniform Distribution Load (Kg/m <sup>2</sup> )	Maximum Recommend ed Load (Kg/m <sup>2</sup> )
1	300	30	38.1 X 38.1	1.5	7066	16959
2	400	30	38.1 X 38.1	2.0	2650	7955
3	500	30	38.1 X 38.1	2.5	1110	3332
4	600	30	38.1 X 38.1	3.0	550	1651
5	700	30	38.1 X 38.1	3.5	425	1277
6	800	30	38.1 X 38.1	4.0	331	994
7	900	30	38.1 X 38.1	4.5	289	866
8	1000	30	38.1 X 38.1	5.0	240	721

## ...and pultruded gratings



Pultruded Gratings				
Sr. No.	Series	Load Bar Spacing (mm)	Grating Depth (mm)	Support Bars Spacing (mm)
1	I-2530	30.48	25.4	152.4
2	I-2538	38.1	25.4	152.4
3	I-3830	30.48	38.1	152.4
4	I-3838	38.1	38.1	152.4
5	I-5050	50.8	50.8	152.4

**...also available in different variations**

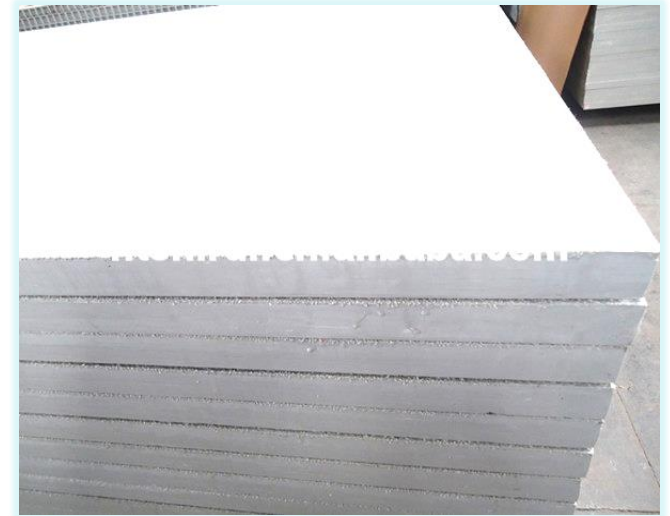
**Anti-skid**



**Chequered plate**



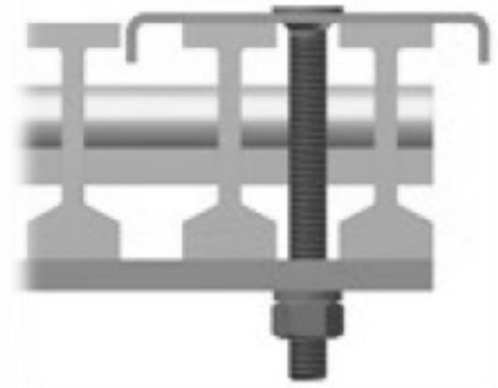
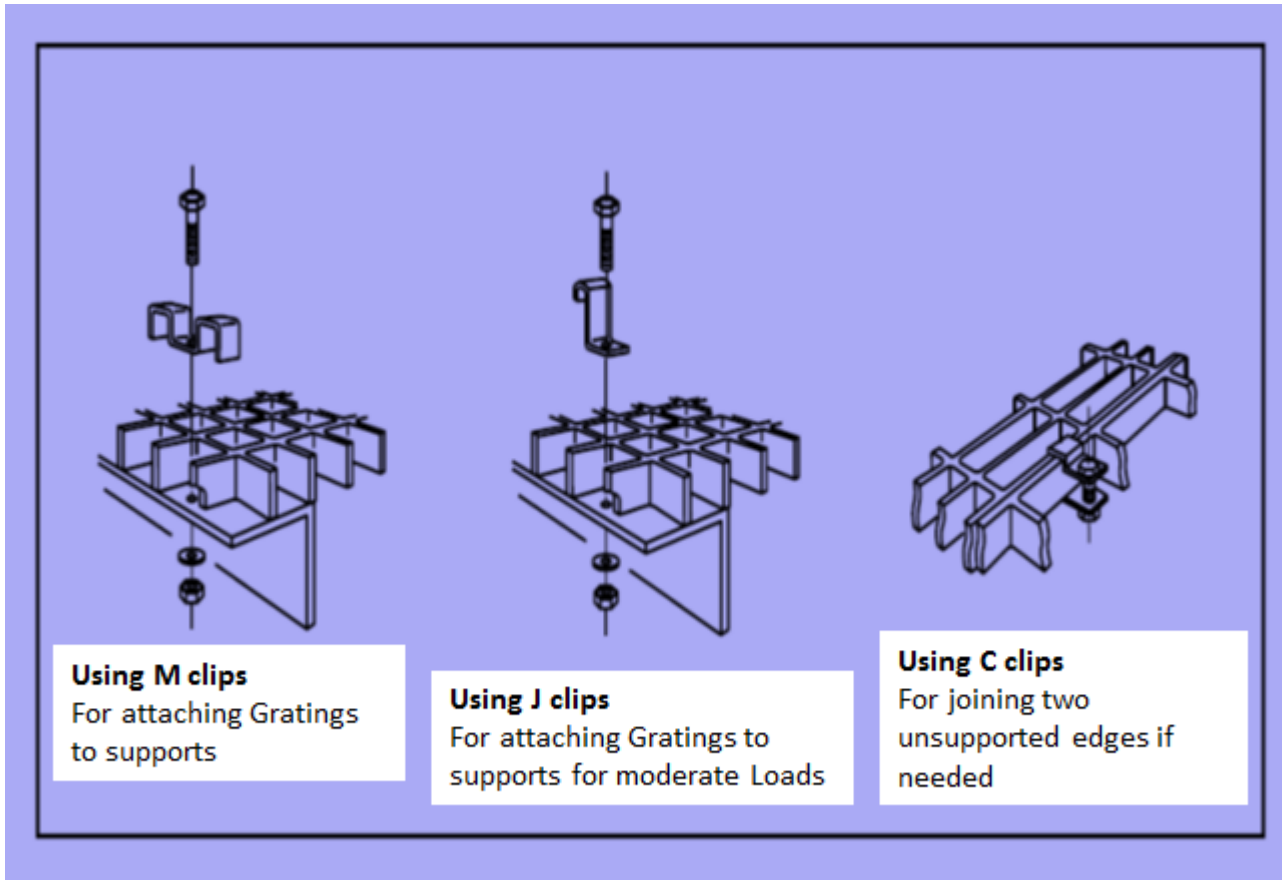
**Plain sheet**



**Gratings are available in various resin systems**

# FRP gratings are easy to install

## Illustration: Molded gratings



## Arvind manufactures FRP poles from 4m – 12m...



Pole Height	Bottom OD(D)	Top OD (d)	Embedded Length(L-l)
4 meter	143 mm	76 mm	750 mm
5 meter	160 mm	76 mm	850 mm
6 meter	176 mm	76 mm	850 mm
7 meter	193 mm	76 mm	1,000 mm
8 meter	210 mm	76 mm	1,000 mm
9 meter	226 mm	76 mm	1,000 mm
10 meter	243 mm	76 mm	1,200 mm
11 meter	260 mm	76 mm	1,600 mm
12 meter	277 mm	76 mm	1,600 mm



...along-with a full range of accessories

**Single arm**

---



**Double arm**

---



**Base Bracket**

---



**External Junction Box**

---



**Internal Junction Box**

---



# Several custom solutions and modular infrastructure options in FRP available (I)

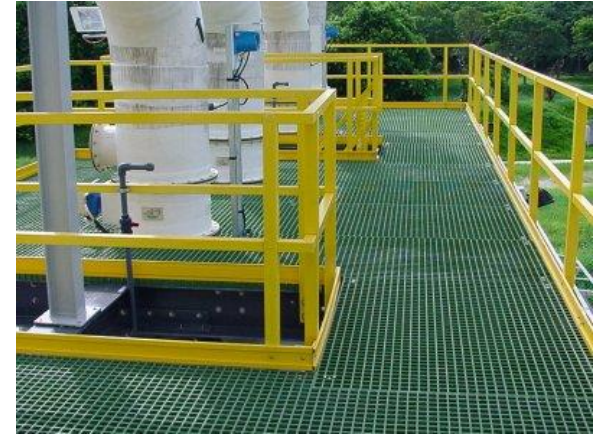
**Platforms**



**Monkey ladders**



**Handrails / Walkways**



**Staircases**



**Fences**



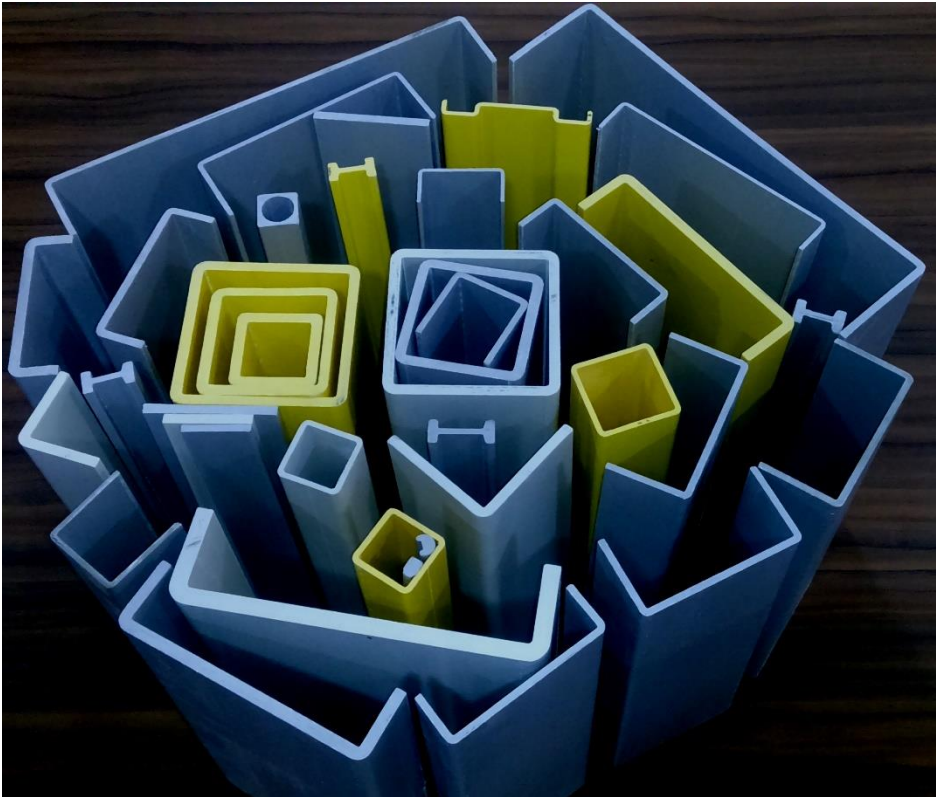
**Trenches**



# Arvind also offers a full range of Pultruded Structural Profiles

## Standard Structural Profiles

---



## Contract Manufacturing

---





**RVND**  
fashioning POSSIBILITIES





**LAPI**  
LABORATORI PRESSIONI INCENDI S.p.A.  
Via Salaria 455/561 00198 Roma (Italy) - Tel. 06/572911  
Fax 06/57291211 - E-mail: LAPI@LAPI.IT  
Web: [www.lapi.it](http://www.lapi.it) - C.A.P. 00198 Roma



**TEST REPORT**  
N° 1008/2015

### ATTESTAZIONE / ATTESTATION

**METODO DI PROVA:**  
N/A

**DEMONSTRAZIONE DELLA PROVA:**  
Demonstration of the standard

**RICHIESTE:**  
Specimen:

**DEMONSTRAZIONE DEL MATERIALE:**  
Demonstration of the material

**DESCRIZIONE DEL MATERIALE:**  
Description of the material

**ATM 1 BR 2013**

Caratteristiche di combustione delle superfici di materiali da costruzione sotto burning characteristics of building materials

**OPG S.p.A.**  
Piazza S. Giovanni, 3/1/1  
28041 ARONA (NO)

**FRP COOLING TOWER STRUCTURAL ELEMENTS –**  
FRP COOLING TOWER STRUCTURAL ELEMENTS –  
(Item: Tack, 1.8 – 2013)

Panelle composite preformate di colore grigio chiaro.  
Light grey pre-made of preformed composite panels.

Questa documentazione fa riferimento al Report n° 1008/2015/05/05/05 emesso da questa Laboratorio.  
This certificate refers to the Test Report n° 1008/2015/05/05/05 issued by the Laboratory.

**RESULTS / RESULTS**

Ref. Lab.	Denominazione del materiale Denomination of the material	Supporto di Prova Test Support	Valori ottenuti Values obtained	CLASSE CLASS
1008/15	FRP COOLING TOWER STRUCTURAL ELEMENTS ARNO (Item: Tack, 1.8 – 2013)	1008/05/05/05/05	19 – 20 – 323 – 432	A

**VALUTAZIONE / JUDGEMENT**

Sulla base dei risultati di prova sopra riportati il materiale in oggetto  
On the basis of the above results the material in object

**È SUFFICIENTE  
IS SATISFACTORY**

secondo la ASTM E 84-2013 IN CLASSE A

**Note / Inclusiones in presente ordinazione / Notes and Inclusiones in this document**

1. In rispetto al contenuto di certificazione rilasciato dalla International Protection Association (IPA) V88 1/16 Safety Code  
In conformità dell'articolo della presente ordinazione si specificano i seguenti: in classificazione dove è richiesta soprattutto.  
The classification where required by the present ordinance is specified as follows:  
L'attenzione è drawn all the use of classification information from the one specified should be carefully reported.

2. Classi: Class 0 - 2 - 25/76 - 4 - 40/120 - Classi Class 0 - 2 - 25/76 - 4 - 40/120 - Classi Class 0 - 2 - 25/76 - 4 - 40/120  
The results obtained for the certification of the material are as follows: Class 0 - 2 - 25/76 - 4 - 40/120 - Classi Class 0 - 2 - 25/76 - 4 - 40/120  
The results obtained for the certification of the material are as follows: Class 0 - 2 - 25/76 - 4 - 40/120 - Classi Class 0 - 2 - 25/76 - 4 - 40/120

3. Questo documento è valido solo per il prodotto specificato e per il prodotto testato e per l'applicazione  
This document is valid only for the product specified and for the product tested and for the application

Report Test n° 1008/2015

**DATA: 29/06/2015**

**Valid until: 31/06/2018**

Questo documento non è valido se non accompagnato dal Certificato di Conformità LAPI e dalla Scheda di Analisi.  
This document is not valid if not accompanied by the Certificate of Conformity LAPI and the Analysis Sheet.

This document has to be signed together with this Report, by the Laboratory Director and the main author of the document. This document does not represent any approval or endorsement of compliance of the tested product under the certification of the International Protection Association.

**Il Responsabile del Laboratorio**  
The Laboratory Manager

**Il Direttore dell'Allegato**  
The Director of the Laboratory

**Il Responsabile del Laboratorio**  
The Laboratory Manager


**Il Direttore dell'Allegato**  
The Director of the Laboratory

Il presente Rapporto di Prova non può essere riprodotto in forma parziale senza l'autorizzazione scritta di questo Laboratorio.

# COMPOSITE TESTING LABORATORY

Centre of Excellence - Composites  
(under Technology Mission on Technical Education, Ministry of Education, Government of India)

**SRINIVASA ENGINEERING PRIVATE LIMITED**  
 B-8, 3RD FLOOR, ANNEX-2, NO. 1002  
 VENGAL Rao STREET, VIJAYAPURAM  
 CHENNAI - 600 093  
 E-MAIL: srinivasae@rediffmail.com  
 TEL: 044-2622-0451



**ARNEEBABAI TEXTILE INDUSTRIES**  
 RESEARCH ASSOCIATION  
 P.O. ARNEEBABAI TEXTILE, ARNEEBABAI 300 005  
 CHENNAI - 600 005  
 Phone: 044-2622-1012, 2622-1014 to 1015  
 Fax: 044-2622-1001  
 E-Mail: arneebai@rediffmail.com

## TEST REPORT

Format No.: COMPR1461015

Test Report No: **COMPR5697-21A/1415**      Date **04/02/2015**

Lab Sample Code      **SCS -5697**

Name and address of customer      **Arned Limited, Industrial Estate, P.O. Arneebabai, Arneebabai, Khatras, Srinivas Arneebabai**

Sample forwarding date and letter No      **R03/20000004      Dated : 04/11/2014**

Date of receipt of sample      **29/11/2014**

Sample description      **FSP Cable Tray**

Method description      **Deflection and Destruction Load test as per customer requirement as per NEMA PD-1993**

Number of samples      **04**


Date of performance of test      **03/12/2014**


**Test Result:**

Span Length: 38 ft (Destruction load test) & Span Length: 3020 mm (Deflection test)

Rung Spacing: 31 ft

Sr. No.	Cable Tray Width mm	Load (kg)	Deflection (mm)	Destruction Load (kg)
1	750	120kg per central load (180 kg) 360 kg - central load 70 kg	8.8 12.6	1670
2	600	90kg per central load (135 kg) 270 kg - central load 70 kg	8.7 10.9	1670
3	300	60 kg per central load (180 kg) 180 kg - central load 70 kg	8.3 10.2	1150
4	150	30 kg per central load (90 kg) 90 kg - central load 70 kg	5.6 7.5	750

  
**HITESH SOLANKI**  
 Technical Manager  
 Composite Testing Laboratory  
 ATMA, Ahmedabad.  
 Authorized By

  
**Test Eng.**

Samples are not returned to ARNEEB. Refer relation to the sample tested. The report and test certificate issued is valid without the return approval of the laboratory. This report is strictly confidential and the test material remains the property of the ARNEEB. This document is confidential. Publication in digital form without the written permission of the ARNEEB is prohibited.

**Report generated on 04/02/2015 at 12:05:57 PM issued at 03/02/2015 and received at ARNEEB on 06/02/2015 test method adopted**

**CONFIDENTIAL WE HAVE ALLOWED US TO SHARE OUR TEST REPORT : COMMITTED TO EXCELLENCE FOR THE CUSTOMER**


# In-house Testing & Research Laboratory





# Why Arvind?

**Arvind lineage:** 100+ year-old financially strong publicly listed corporate with experience of delivering high quality products to global customers

**Scale:** 500T+ pultrusion production capacity per month with sufficient resources to expand, ability to do ~300 fanstack panels/month

**One Stop Shop for FRP:** Ability to supply complete range of FRP products required in Cooling Tower Projects

**Systems and processes:** Strong in-house processes for production planning, export logistics support and quality control to ensure total customer satisfaction

**Best cost structure:** Backward integration of glass fabrics, scale for glass and resin purchase, export logistics advantage

**Team capabilities:** All round-capabilities across team supported by expertise across various areas by broader Arvind team



Thank You!