



**ARC**

Insulation & Insulators (P) Ltd.

Manufacturer of Fiberglass Composites



Designed for  
Your  
Cable  
Support  
Requirements

- + Cable trays
- + Cable ladders
- + Trunking & accessories



# GRP/FRP Cable Management Systems

The growing use of composites as an alternative to traditional materials such as steel, aluminium, etc. is basically due to the specific characteristics of the composite, such as:

- + The unique resistance to corrosion contributes to reduce the life cycle costs of the composite installation.
- + A specific mechanical strength is higher at lower weight, in comparison to conventional materials of construction.
- + Easy & quick installation.
- + High electrical insulation properties.

The **ARC GRP / FRP cable trays** are designed & manufactured to provide a stable & dependable cable support in highly corrosive applications. From power plants to fertilizer industries, paper mills to refineries & laboratories, sound electrical design requires an adaptable cable support system that is reliable. The ARC FRP Cable trays provide a solution for cabling networks that must be upgraded, reconfigured or relocated. The ARC Cable Support Systems resist many corrosive environments, particularly where conditions indicate that conventional materials will not provide a economic service life.

Constructed from glass reinforced thermoset Isophthalic resins, ARC Cable Support Systems are designed and manufactured with a structural integrity normally only associated with steel and aluminum, but without their corrosion, weight and electrical conductivity problems.

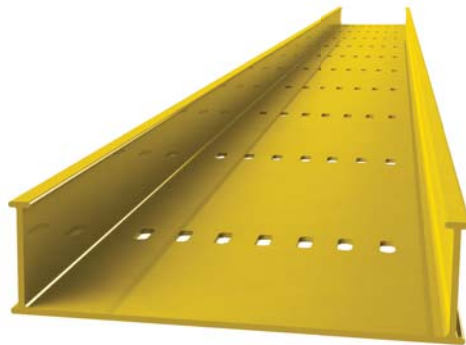
There are two types of FRP cable trays:



ladder  
type  
system

The cable ladders comprises two channel side rails connected by transverse rungs. All rungs to side channel connections have a mechanical lock. They are used for any mixture of power or lighting cables with any mixture of control or signal cables.

perforated  
type  
system



The perforated type, solid bottom, pre-drilled cable tray are designed for light loads namely instrumentation and control cables and for transition from cable trays to individuals control points. Perforations are on standard 300 mm centres and provide both ventilation and sites for cable tie down.

Cable Tray structural characteristics provides excellent support against

- + Cable Loads
- + Concentrated Loads
- + Wind Loads
- + Ice Loads
- + Snow Loads
- + Seismic Loads
- + Splices

#### Advantages of ARC FRP Cable Trays

- + Full Ventilation
- + Long Support Spans
- + Corrosion Resistance
- + Transparent to RF transmission
- + Non-conductive and Non-magnetic
- + Lightweight and Manageable
- + High Strength to Weight Ratio

# MANUFACTURING PROCESS

The ARC profiles are designed and manufactured as structural components.

All ARC Cable Tray Systems (CTS) are designed using high strength to weight ratio pultruded structural composite profiles. The ARC CTS are manufactured as per:

- NEMA FG 1: 1993 Rev. 1 (1994)
- IS 6746: 1994
- ONGC 4000 S

All cable support system components are manufactured using Isophthalic polyester fire retardant resin systems that enable compliance to a flame spread rating of less than 25 for ASTM E-84 and a self extinguishing rating under ASTM D 635. Cable trays are constructed from high strength pultruded channel profile. Tray can be provided plain or perforated to provide cable fastening and/or ventilation. All fitting, horizontal bends, risers, reducers, tees, etc. used to enable cable routings to deviate from a straight line onto another plane, are constructed from the same profiles as the straight ladder sections. Standard joining of cable ladder or tray sections and fittings, is accomplished via FRP splice plates and stainless steel fasteners. Fibreglass joining accessories are also available for systems requiring total insulating properties. Straight sections and fittings can be pre-drilled to accept joining accessories, if desired. Cut edges and drilled holes are all sealed at manufacture.

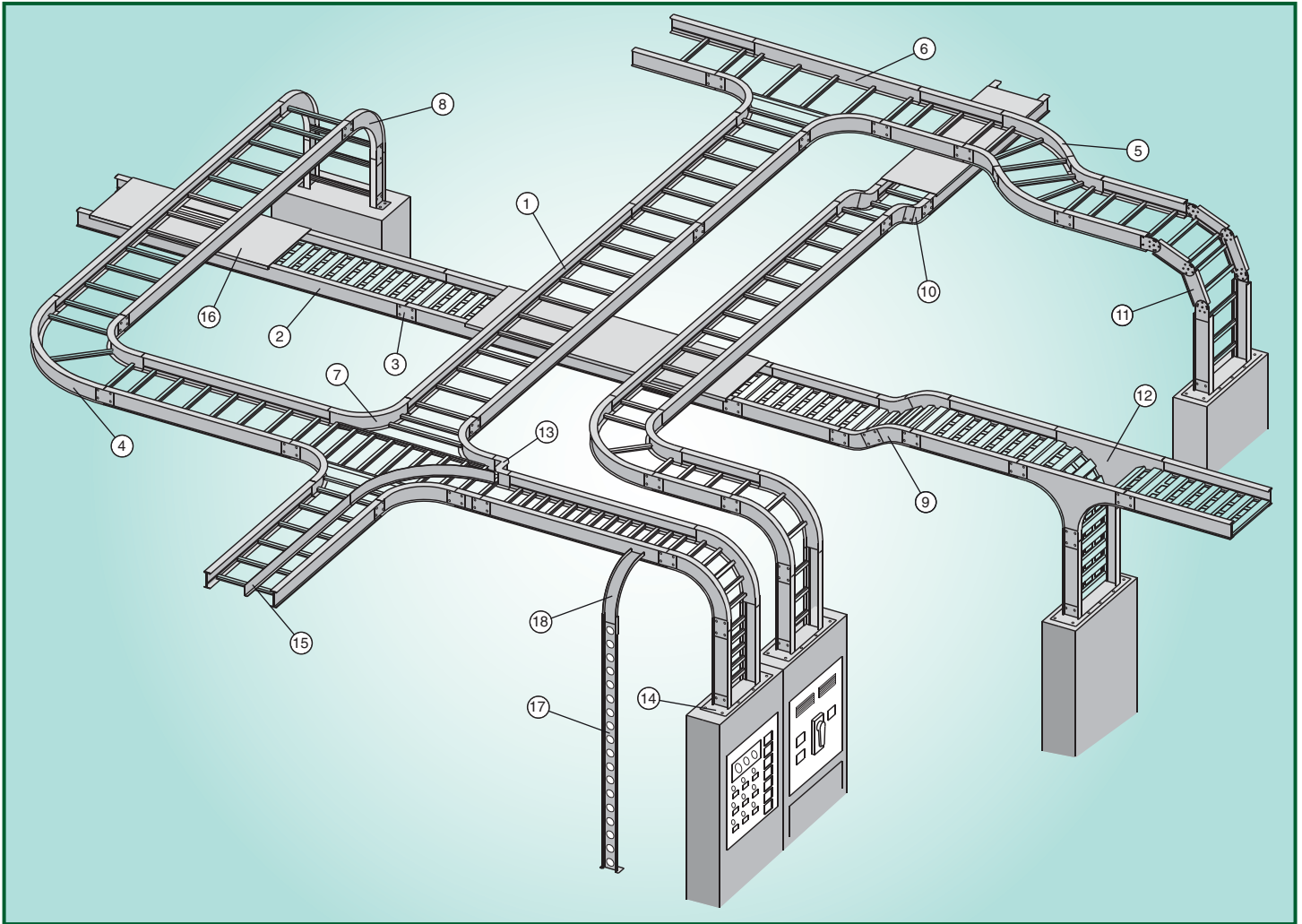


## TESTS AND STANDARDS FOR THE PULTRUDED PROFILES

ASTM standards define physical properties tests for the materials used to pultrude the cable tray. The specific ASTM test methods for mechanical, thermal and flammability properties are identified below. ASTM standard material properties for fiberglass channel and strut are identical to those of the cable tray because they are pultruded from the same materials.

Properties	Test Method	Unit / Value	Longitudinal	Transverse
Tensile Strength	ASTM D638	MPa	207.0	48.0
Tensile Modulus	ASTM D638	MPa x 10 <sup>4</sup>	1.724	0.552
Flexural Strength	ASTM D790	MPa	207	69
Flexural Modulus	ASTM D790	MPa x 10 <sup>4</sup>	1.10	0.552
Izod Impact	ASTM D256	kJ/m	1.495	214.0
Compressive Strength	ASTM D695	MPa	207.0	103.4
Compressive Modulus	ASTM D695	MPa x 10 <sup>4</sup>	1.724	0.690
BARCoI Hardness	ASTM D2583	--	45.0	45.0
Shear Strength	ASTM D732	MPa	38	38.0
Density	ASTM D1505	Kg/m <sup>3</sup>	1605 - 1716.0	-
Coefficient of Thermal Expansion	ASTM D696	cm/cm/°F	5 x 10 <sup>-6</sup>	-
Water Absorption	ASTM D570	Max %	0.5	-
Dielectric Strength	ASTM D149	kV/mm	8.0	-
Flammability Classification	UL94	VO	-	-
Flame Spread	ASTM E-84	25 max	-	-

# Typical cable tray layout



## Nomenclature

- |  |  |
|--|--|
| 1. Ladder Type Cable Tray                                | 10. 30° Vertical Inside Bend, Ladder Type Cable Tray     |
| 2. Ventilated Trough Type Cable Tray                     | 11. Vertical Bend Segment (VBS)                          |
| 3. Straight Splice Plate                                 | 12. Vertical Tee Down, Ventilated Trough Type Cable Tray |
| 4. 90° Horizontal Bend, Ladder Type Cable Tray           | 13. Left Hand Reducer, Ladder Type Cable Tray            |
| 5. 45° Horizontal Bend, Ladder Type Cable Tray           | 14. Frame Type Box Connector                             |
| 6. Horizontal Tee, Ladder Type Cable Tray                | 15. Barrier Strip Straight Section                       |
| 7. Horizontal Cross, Ladder Type Cable Tray              | 16. Solid Flanged Tray Cover                             |
| 8. 90° Vertical Outside Bend, Ladder Type Cable Tray     | 17. Ventilated Channel Straight Section                  |
| 9. 45° Vertical Outside Bend, Ventilated Type Cable Tray | 18. Channel Cable Tray, 90° Vertical Outside Bend        |



## ARC

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