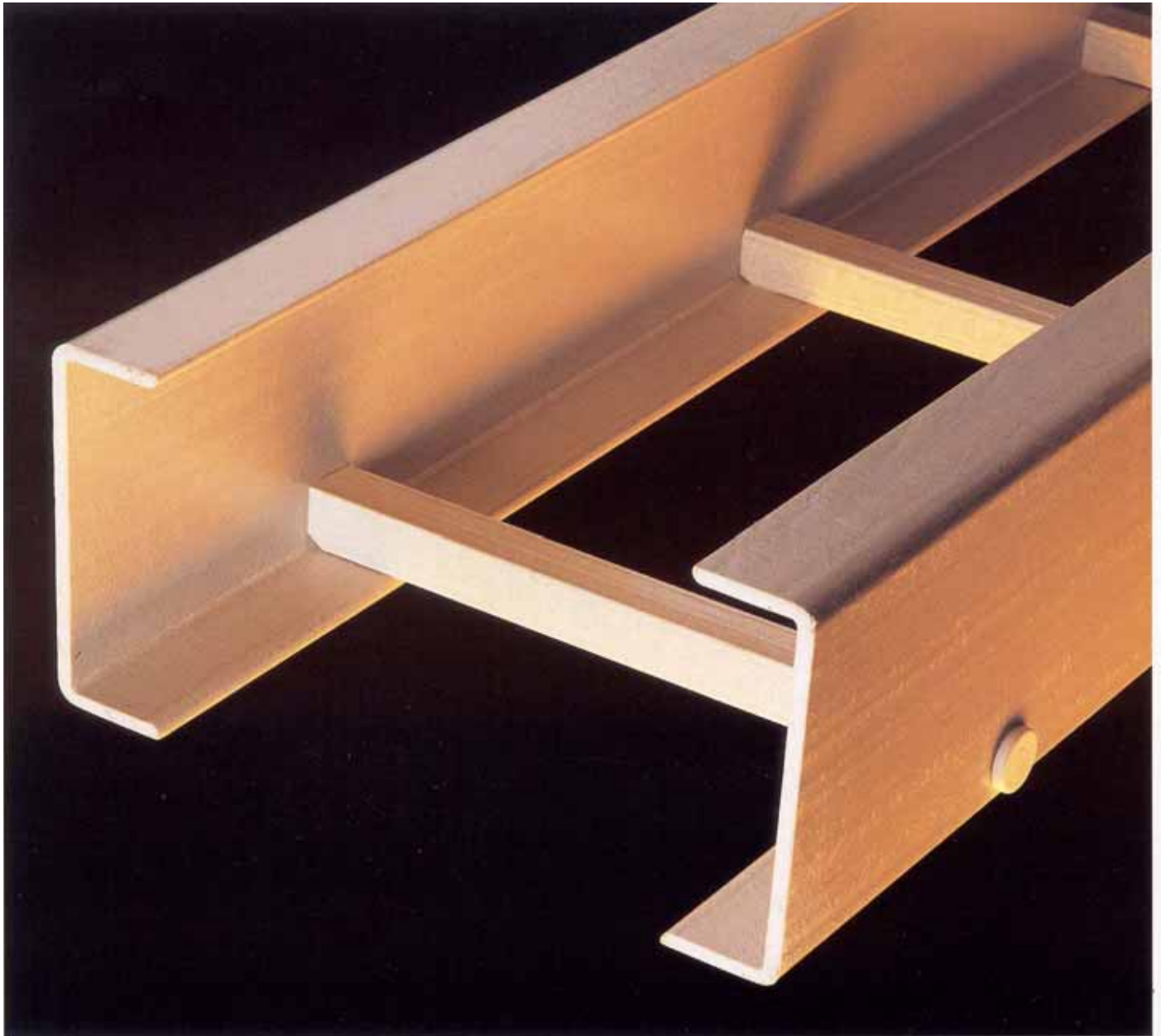


FIBREGLASS CABLE SUPPORT SYSTEMS



PO Box 72 Bayswater Victoria 3153 Australia
Tel +61 3 8727 9600 Fax +61 3 8727 9688
Website www.exelcomposites.net

FIBREGLASS CABLE SUPPORT SYSTEMS

Exel Composites Cable Support Systems offer engineers a structural product for solving many design and plant engineering problems, enabling long term reliable support of expensive and often critical cables.

Exel Composites Cable Support Systems possess unique properties which enable them to resist many corrosive environments, particularly where conditions indicate that conventional materials will not provide an economic service life.

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

CHEMICAL AND CORROSION RESISTANCE

Exel Composites cable Support Systems resist acids, salts, alkalis and a wide range of aggressive chemicals and environments which have drastic effects on galvanised steel and aluminium. Even coated steel or aluminium products can suffer minute damage from scratches during installation or in service. These will initiate corrosion and reduce the life of the cable support system. The use of premium grade resins, non glass surfacing tissues and ultra violet inhibitors give Exel Composites Cable Support Systems optimum protection against corrosion.

HIGH STRENGTH TO WEIGHT RATIO

Exel composites Cable Support Systems have a superior strength to weight ratio compared to steel or aluminium whilst maintaining a similar structural integrity. The pultrusion process utilised in manufacture, results in high glass content and consistent reinforcement location. These are critical for consistent performance and achievement of the necessary physical properties.

LIGHTWEIGHT AND MANAGEABLE

Pultruded fibreglass profiles used in Exel Composites Cable Support Systems have a specific gravity of one-fourth that of steel and two thirds that of aluminium, allowing for considerable simplified erection and handling. Unlike stainless steel, Exel Composites Cable Support Systems can be easily drilled and cut on site using only hand tools.

NON CONDUCTIVE AND NON MAGNETIC

As Exel Composites cable ladder and tray is non conductive, there is no concern of transmitting electricity into the support system from damaged cables.

Additionally there is no requirement for special support conditions to prevent electrolytic corrosion.

Non conductive and non magnetic features mean a safer support system.



Cable ladder installation at S.C.M. Chemicals Limited's titanium dioxide Plant in Western Australia

TRANSPARENT TO RF TRANSMISSION

Fibreglass composites do not cause electromagnetic interference and are transparent to radio frequency transmissions. Exel composites Cable Support Systems provide a solution in applications where clarity of communication transmissions is paramount.

COST PERFORMANCE

Very favourable results have been demonstrated with Exel Composites Cable Support Systems, emphasizing low installation costs, long service life and a minimum of maintenance.

PRODUCT FEATURES

DESIGN

Exel Composites Cable Support System is designed to comply with the requirements of NEMA specifications FG1-1986 under three load/span classifications.

CLASS A

75kg/m on a recommended maximum span of 3.5m

CLASS B

110kg/m on a recommended maximum span of 6.0m

CLASS C

150kg/m on a recommended maximum span of 6.0m

Cable Ladder produced under any of these classifications is available in lengths of either 3m or 6m and in widths from 150mm to 900mm. Rung spacings are available at either 150 or 300mm centres. All fittings are based on a standard radius of 600mm. Variations to these lengths, widths, rung spacings and radius are available to order.

Cable Tray is produced in standard lengths of 3 metres. Standard widths range from 100 to 300mm. Other tray widths can be made to order

Tray can be provided plain or with a perforated base. Perforations are on standard 300mm centres and provide both ventilation and sites for cable tie down.

All cable support system components are manufactured using isophthalic polyester fire retardant resin systems that enable compliance to the VO rating of UL94, a flame spread rating of less than 25 for ASTM E-84 and a self extinguishing rating under ASTM D635.

For a more aggressive corrosion environment, a vinyl ester resin system is available to order, with equivalent fire retardant properties.

CONSTRUCTION

All cable support systems are designed using high strength to weight ratio pultruded structural composite profiles.

The ladder type system comprises two channel side rails connected by transverse rungs. All rungs to side channel connections have both a mechanical and adhesive lock.

Cable trays are constructed from high strength pultruded channel profile. Trays can be provided plain or perforated to provide cable fastening and/or ventilation.

All fittings, 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 316 stainless steel splice plates and 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.

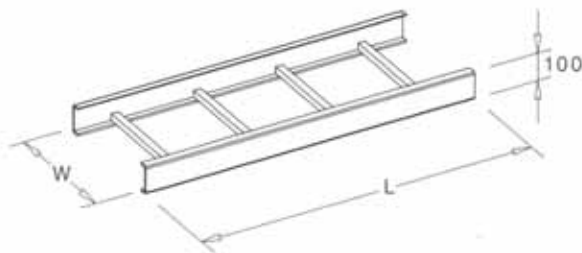
Cut edges and drilled holes are all sealed at manufacture.

CAUTION: In the case of site fabrication, all cut edges and holes must be sealed with a resin sealer prior to installation.

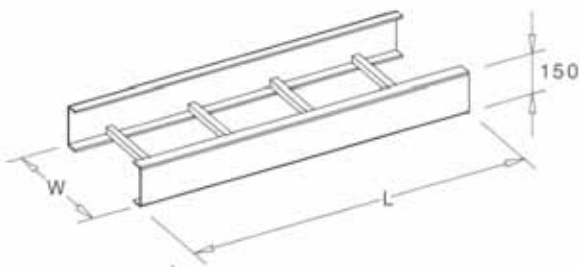
PRODUCT SPECIFICATIONS

CABLE LADDER

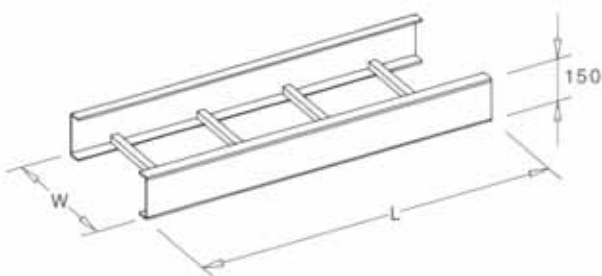
Medium Duty Cable Ladder (NEMA Class A Type MD)



Heavy Duty Cable Ladder (NEMA Class B Type HD)



Extra Heavy Duty Cable Ladder (NEMA Class C Type EHD)



Order Code	Rung Pitch mm	Width W mm	Ladder Weight/m kg
MD-150-150-L	150	150	4.1
MD-300-150-L	300	150	3.6
MD-150-300-L	150	300	4.8
MD-300-300-L	300	300	4.0
MD-150-450-L	150	450	5.6
MD-300-450-L	300	450	4.4
MD-150-600-L	150	600	6.4
MD-300-600-L	300	600	4.8
MD-150-750-L	150	750	7.2
MD-300-750-L	300	750	5.2
MD-150-900-L	150	900	8.0
MD-300-900-L	300	900	5.6

Order Code	Rung Pitch mm	Width W mm	Ladder Weight/m kg
HD-150-150-L	150	150	5.7
HD-300-150-L	300	150	5.2
HD-150-300-L	150	300	6.5
HD-300-300-L	300	300	5.7
HD-150-450-L	150	450	7.3
HD-300-450-L	300	450	6.2
HD-150-600-L	150	600	8.1
HD-300-600-L	300	600	6.7
HD-150-750-L	150	750	8.9
HD-300-750-L	300	750	7.2
HD-150-900-L	150	900	9.7
HD-300-900-L	300	900	7.7

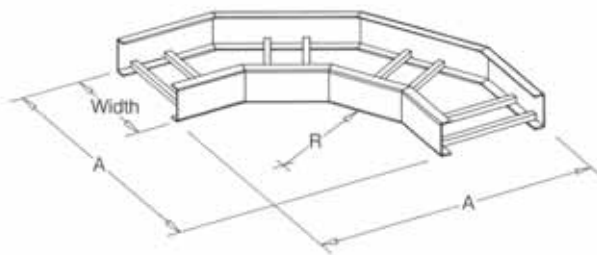
Order Code	Rung Pitch mm	Width W mm	Ladder Weight/m kg
EHD-150-150-L	150	150	8.2
EHD-300-150-L	300	150	7.8
EHD-150-300-L	150	300	9.1
EHD-300-300-L	300	300	8.3
EHD-150-450-L	150	450	9.9
EHD-300-450-L	300	450	8.7
EHD-150-600-L	150	600	10.7
EHD-300-600-L	300	600	9.1
EHD-150-750-L	150	750	11.5
EHD-300-750-L	300	750	9.5
EHD-150-900-L	150	900	12.3
EHD-300-900-L	300	900	9.9

Note: L = 3 metre or 6 metre
W = Inside width

PRODUCT SPECIFICATIONS

CABLE LADDER FITTINGS

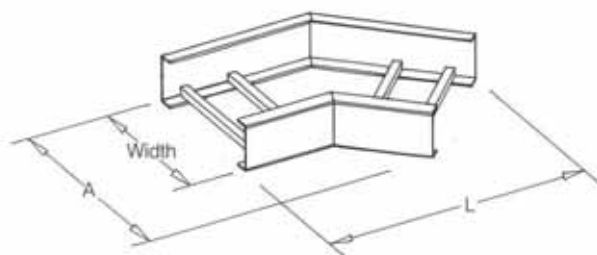
90° Horizontal Bend (HB)



Width mm	Dimension A (for R = 600 mm)
150	900
300	1050
450	1200
600	1350
750	1500
900	1650

Order Code: Type - HB - Radius - Width - 90
e.g. MD - HB - 600 - 300 - 90

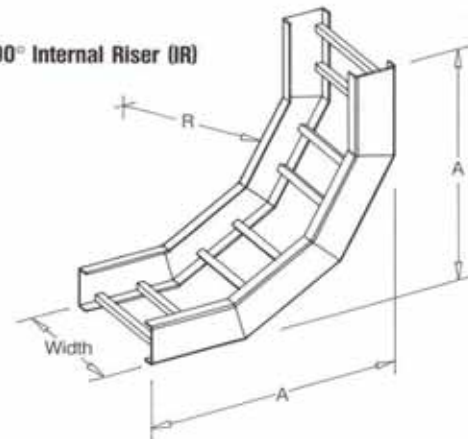
45° Horizontal Bend (HB)



Width mm	Dimensions (mm) (for R = 600 mm)	
	A	L
150	367	609
300	517	715
450	667	821
600	817	927
750	967	1033
900	1117	1139

Order Code: Type - HB - Radius - Width - 45
e.g. HD - HB - 600 - 300 - 45

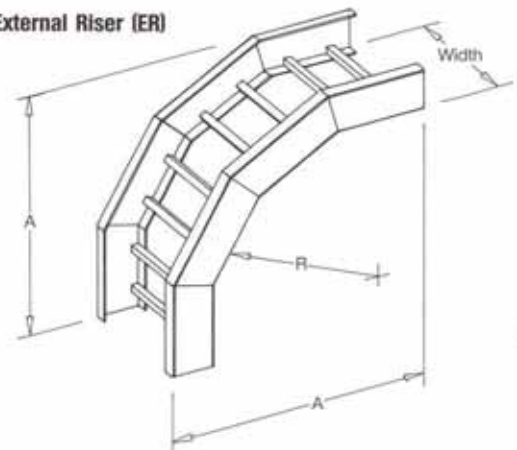
90° Internal Riser (IR)



Dimension A (for R = 600 mm)	
Medium Duty	Heavy Duty
840 mm	890 mm

Order Code: Type - IR - Radius - Width - 90
e.g. HD - IR - 600 - 300 - 90

90° External Riser (ER)



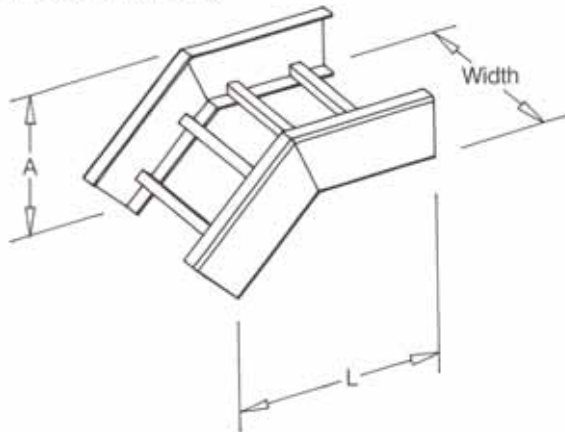
Dimension A (for R = 600 mm)	
Medium Duty	Heavy Duty
840 mm	890 mm

Order Code: Type - ER - Radius - Width - 90
e.g. MD - ER - 600 - 300 - 90

PRODUCT SPECIFICATIONS

CABLE LADDER FITTINGS (continued)

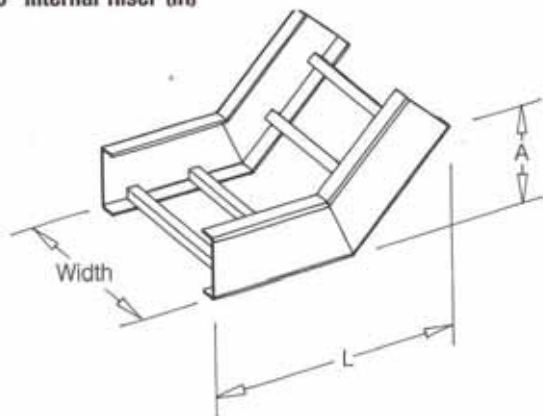
45° External Riser (ER)



Medium Duty		Heavy and Extra Heavy Duty	
Dimension A (mm)	Dimension L (mm)	Dimension A (mm)	Dimension L (mm)
242	338	348	474

Order Code: Type – ER – Radius – Width – 45
 e.g. MD – ER – 600 – 450 – 45

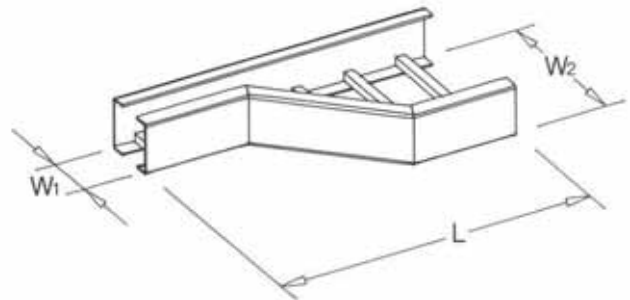
45° Internal Riser (IR)



Medium Duty		Heavy and Extra Heavy Duty	
Dimension A (mm)	Dimension L (mm)	Dimension A (mm)	Dimension L (mm)
170	410	240	580

Order Code: Type – IR – Radius – Width – 45
 e.g. HD – IR – 600 – 300 – 45

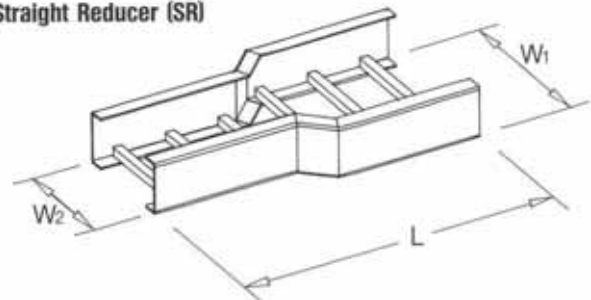
Right or Left Hand Reducer (RR or LR)



W2 (mm)	W1 (mm)				
	900	750	600	450	300
150	1340	1190	1040	890	740
300	1190	1040	890	740	
450	1040	890	740		
600	890	740			
750	740				

Order Code: Type – Hand – W1 – W2
 e.g. HD – RR – 600 – 150

Straight Reducer (SR)

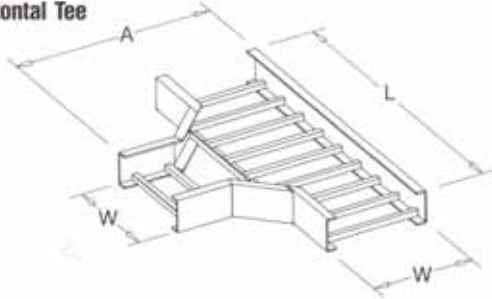


W2 (mm)	W1 (mm)				
	900	750	600	450	300
150	1040	890	890	1040	890
300	890	890	1040	890	
450	890	1040	890		
600	1040	890			
750	890				

Order Code: Type – SR – W1 – W2
 e.g. MD – SR – 600 – 300

PRODUCT SPECIFICATIONS

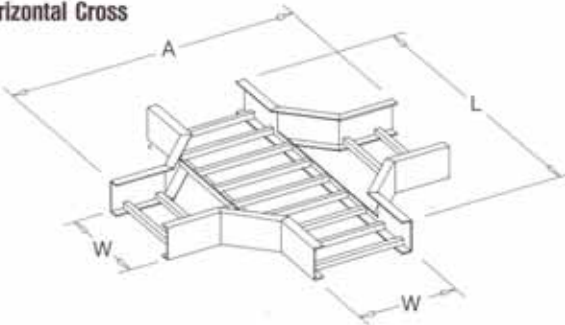
Horizontal Tee



Width (mm) W	Medium Duty		Heavy and Extra Heavy Duty	
	Dimension A (mm) for R = 600 mm	Dimension L (mm)	Dimension A (mm) for R = 600 mm	Dimension L (mm)
150	765	1190	800	1490
300	915	1340	950	1640
450	1065	1490	1100	1790
600	1215	1640	1250	1940
750	1365	1790	1400	2090
900	1515	1940	1550	2240

Order Code: Type – HT – Radius – W
e.g. HD – HT – 600 – 300

Horizontal Cross



Width (mm) W	Medium Duty		Heavy and Extra Heavy Duty	
	Dimension A (mm) for R = 600 mm	Dimension L (mm)	Dimension A (mm) for R = 600 mm	Dimension L (mm)
150	1370	1190	1440	1490
300	1520	1340	1590	1640
450	1670	1490	1740	1790
600	1820	1640	1890	1940
750	1970	1790	2040	2090
900	2120	1940	2190	2240

Order Code: Type – C – Radius – W
e.g. MD – C – 600 – 300

CABLE TRAY AND FITTINGS

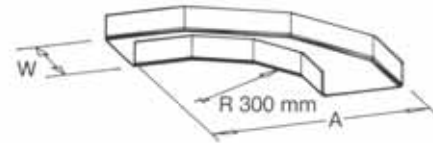
Tray (T)



Order Code	W	H
T-100	102	45
T-150	150	45
T-225	225	70
T-300	300	70

For perforated tray, prefix order code with a "P", e.g. PT-100.

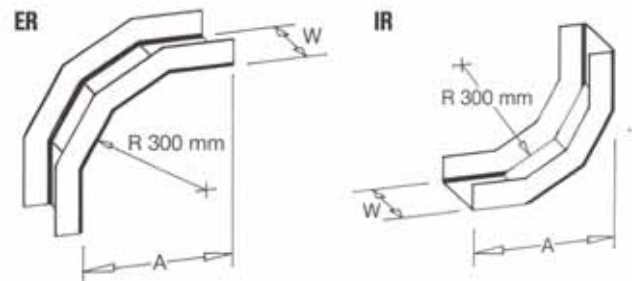
90° Horizontal Bend (HB)



Width (mm)	Dimension A (mm)
102	475
150	525
225	600
300	675

Order Code: T – HB – Radius – Width
e.g. T – HB – 300 – 225

90° Internal/External Riser (IR or ER)



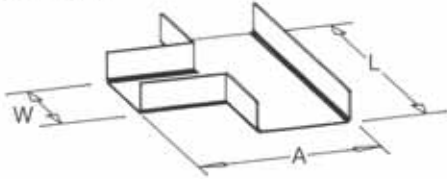
Width (mm)	Dimension A (mm)
All	380

Order Code: T – IR or ER – Radius – Width
e.g. T – IR – 300 – 225

PRODUCT SPECIFICATIONS

CABLE TRAY AND FITTINGS (continued)

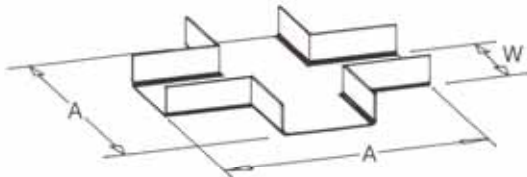
Horizontal Tee (HT)



Width (mm)	Dimension A (mm)	Dimension L (mm)
102	300	500
150	350	550
225	425	625
300	500	700

Order Code: T - HT - Width
e.g. T - HT - 300

Horizontal Cross (HC)

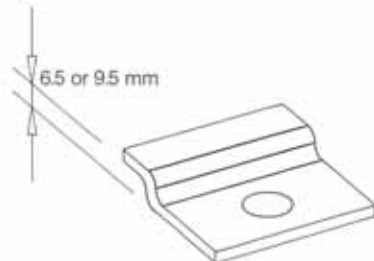


Width (mm)	Dimension A (mm)
102	500
150	550
225	625
300	700

Order Code: T - HC - Width
e.g. T - HC - 300

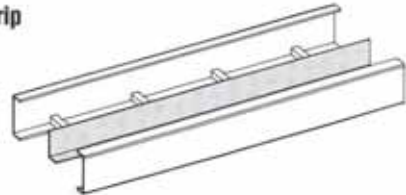
CABLE LADDER ACCESSORIES

Hold Down Clamp (HDC)



Standard clamps are 316 SS, FRP clamps are available on request. 316 SS fasteners are not included but can be supplied on request if length is specified.

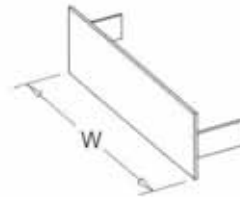
Divider Strip



Angle divider strip is available for all MD, HD and EHD ladder types. It is fixed to rungs via nylon drive rivets.

To order, specify the following code - MD-3 for medium duty ladder, HD-4 for heavy and extra heavy duty ladders.

Blind End (BE)



Available for MD, HD and EHD ladder types. Complete code with value for W - ladder width when ordering.

Order Code: Type - BE - Width
e.g. HD - BE - 300

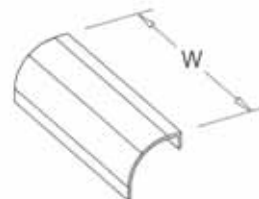
316 SS fasteners are included.

Covers (CL)



Standard covers are flat and made from 3 mm FRP sheet. Covers are supplied with nylon drive rivets. Other cover designs and hold down clamps can be supplied on request.

Drop Out (DO)



W = inside width of ladder section.

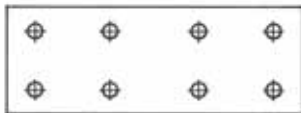
PRODUCT SPECIFICATIONS

CABLE LADDER AND TRAY ACCESSORIES

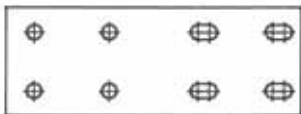
Splice Plates

Splice Plates for Cable Tray up to 150 mm in width are 40 mm wide. For tray greater than 225 mm in width, and medium duty cable ladder, splice plates are 55 mm wide, and for heavy and extra heavy duty ladder are 100 mm wide.

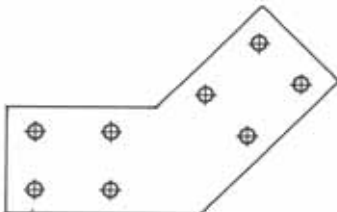
Straight



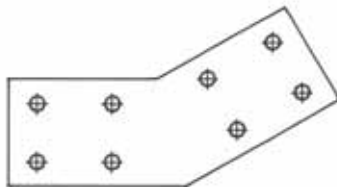
Expansion



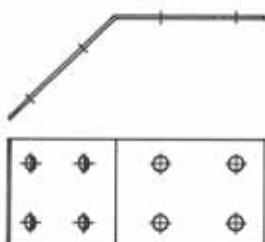
45° Vertical



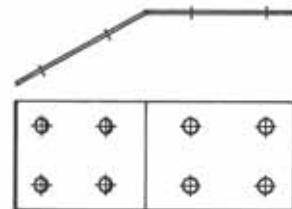
30° Vertical



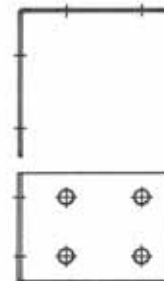
45° Horizontal



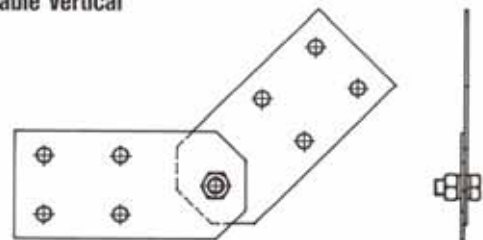
30° Horizontal



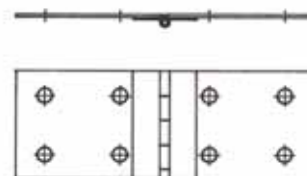
90° Horizontal



Adjustable Vertical



Adjustable Horizontal



Note:

The quantity of fasteners per splicer plate varies to suit cable ladder and tray size.

INSTALLATION

The installation of Exel Composites Cable Support Systems should be in accordance with the NEMA Standards Publication No. FG1-1986.

SUPPORT LOCATIONS

Straight Sections

Supports should be located whenever practical, so that all splice plate connectors between horizontal straight sections are located between the support point and the quarter point of the span. It is desirable to have the straight sections act as a continuous beam to enable the individual spans to act collectively to reduce deflection and support the loads imparted by the cables.

Unspliced straight sections should be used on all simple spans and on end spans of continuous span arrangements.

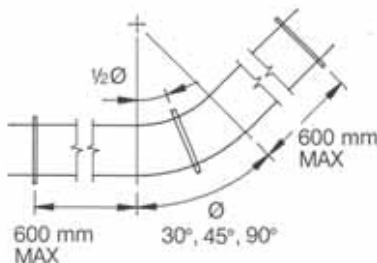
A support should be located 600mm on each side of an expansion splice plate.

Vertical straight lengths should be supported at intervals dictated by the building structure but not exceed 6 metres on centres.

Horizontal Fitting Support

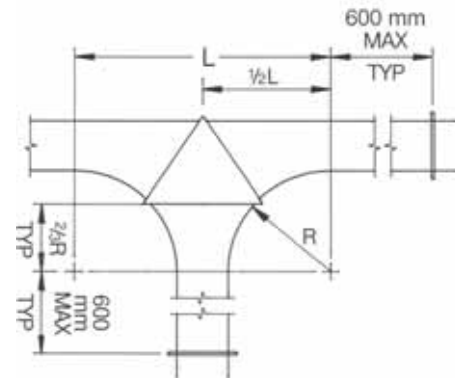
Supports should be placed within 600mm of each fitting extremity and as follows:

- 90 degree supports at the 45 degree point of the arc.
- 45 degree supports at the 22.5 degree point of the arc (except for 300mm radii).
- 30 degree supports at the 15 degree point of the arc (except for 300mm radii).



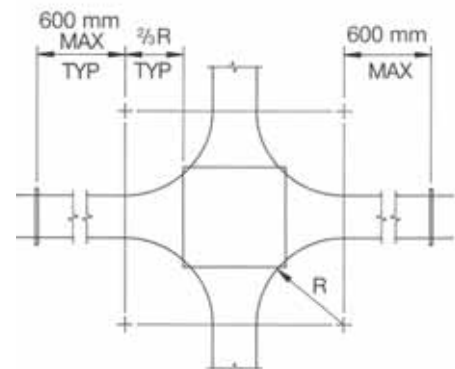
Horizontal Tee Supports

Support shall be placed within 600mm of each of the three openings connected to other cable ladder items for 300mm radius. On all other radii, at least one support should also be placed under each side rail of the horizontal tee.



Horizontal Cross Supports

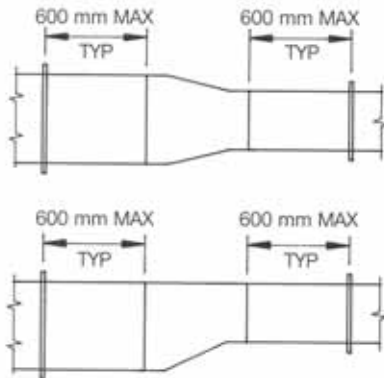
Supports shall be placed within 600mm of the four openings connected to other cable ladder items for the 300mm radius. On all other radii, at least one support should also be placed under each side rail of the cross.



INSTALLATION

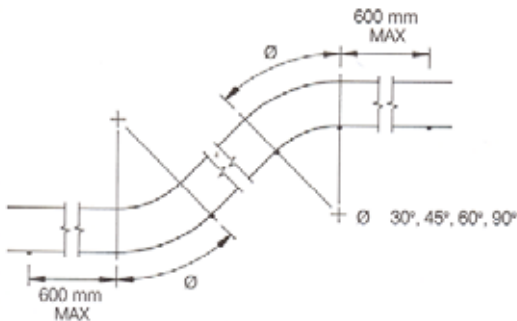
Reducer Fitting Supports

Straight and right or left hand reducers should be supported within 600mm of each extremity.



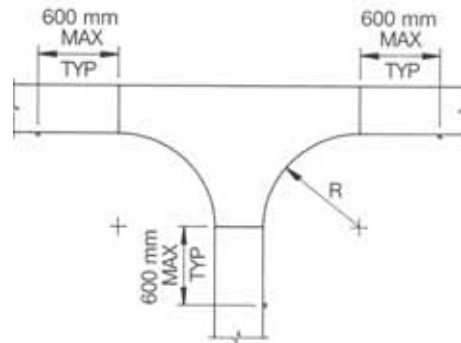
Vertical Fitting Supports

Vertical fittings at the top of runs should be supported at each end. Fittings at the bottom of runs should be supported at the top of the fitting and within 600mm of the lower extremity of the fitting.



Vertical Tee Supports

Vertical tee fittings should be supported within 600mm of each fitting extremity.



Thermal Contraction and Expansion

When expansion splice plate connectors are used, fiberglass cable ladder should be permitted free longitudinal movement at all support locations between expansion splice plate connections except at one fixed location approximately halfway between the connections.

Thermal contraction and expansion data is shown in the table below.

Warning!

In as much as Exel Composites Cable Support Systems are designed to support power or control cables, or both, it is not intended or designed to be a walkway for personnel.

The user is urged to display appropriate warnings against the use of this support as a walkway.

The following language is suggested:

“Warning! Not to be used as a walkway, ladder or support for personnel. To be used only as a mechanical support for cables and tubing”.

(Refer NEMA FG1-1986 Sec 7.6)

Temperature Differential Degrees C	Cable Ladder Length For 25mm expansion	Cable Ladder Length for each Expansion Splice Plate	
		MD	HD and EHD
15	188m	68m	128m
25	113m	41m	77m
40	71m	26m	48m
55	51m	18m	35m
70	40m	14m	27m
85	33m	12m	22m
100	28m	10m	19m

APPLICATION

A wide variety of industries take advantage of the benefits of Exel Composites Cable Support Systems.

- Chemical Processing
- Waste water and sewage treatment
- Petrochemical
- Offshore Oil and Gas Platforms
- Mineral Processing
- Galvanising and Plating
- Fertiliser Processing
- Ports and Harbours
- Food and Beverage
- Tanneries
- Aluminium and Bauxite Processing

SUGGESTED CABLE SUPPORT SPECIFICATION

- Fibreglass tray and ladder support systems shall be by Exel Composites.
- Cable Ladder shall be type MD, HD or EHD to NEMA Class A, B or C.
- All structural components shall be fire retardant and comply with ASTM D-635, ASTM E-84 and UL94 V-O fire ratings.
- All transition fittings shall be made of the same high strength materials as the straight ladder sections. Fitting width and bend radii to be specified in customer drawings.
- All accessory items shall be produced by Exel Composites and where they are special, shall be fully compatible with the system.

QUALITY ASSURANCE

The quality management system operating throughout Exel Composites is certified to the International Standard ISO 9001. This system is fully implemented throughout the company and covers design, development, production and management.



RESEARCH AND DEVELOPMENT

Exel Composites has a fully equipped R&D Laboratory and highly trained personnel. The company's Chemists and Engineers welcome the opportunity to develop innovative solutions to customer problems.



Extensive physical testing can be carried out in Exel Composites' well equipped R&D facilities



Head Office:

991 Mountain Highway, Boronia, Victoria 3155
P.O. Box 72, Bayswater, Victoria, 3153, Australia
Telephone 61 3 8727 9600 Facsimile 61 3 8727 9688
Website: www.exelcomposites.net
E-mail: office.melbourne@exel.net

Brisbane Office:

15 Ada Street, Coopers Plains, Queensland 4108
P.O. Box 391, Archerfield, Queensland 4108
Telephone 61 7 3274 1099 Facsimile 61 7 3274 2041
Email: office.brisbane@exel.net

Exel Composites—ABN 41 005 952 698

Although we believe the data in this publication to be accurate and reliable, we offer it as a service only and assume no liability in regard to its use.

Brochure No. 14