

FRP/GRP SOLUTIONS FOR CABLE MANAGEMENT SYSTEMS



composites
enduro

LASTING SOLUTIONS *for*
CHALLENGING CONDITIONS



Lasting Solutions *for* Challenging Conditions

Who we are

At Enduro Composites, we are dedicated to developing products and solutions that deliver meaningful value and service for our customers. With a history of innovation and industry firsts, our fiber reinforced polymer solutions have earned worldwide respect and recognition.

Quality and consistency

Enduro is the world leader in the manufacture and development of fiberglass cable tray and other FRP/GRP systems. With a world-class quality testing laboratory, Enduro ensures consistent and reliable product performance through comprehensive programs of quality control.

Single source responsibility

Because we have been providing FRP/GRP cable management solutions for over three decades, our product offering is one of the broadest in the industry. Combined with our other manufacturing, engineering and design capabilities, this enables us to offer application-specific solutions to just about any design problem. And, since we are vertically integrated, we can deliver these solutions on time and on budget, at the quality level our customers expect.

Design and engineering

Enduro's experienced technical staff can provide engineering and design assistance for your project. If you have a unique design problem, chances are good we have encountered something similar before.

Specification assistance

The specification phase of a project is the most important to ensure the success of a composite cable management solution. With our broad history of installations in a wide variety of challenging environments, we can help you specify the best resin system and the right structural properties to ensure long life and low cost of ownership.

AutoCAD, PDMS

We can assist you in the design process with AutoCAD details. In addition, Enduro's cable tray offering is available in PDMS. Contact us today for more information.

Service and support

Our customer service desk is available to assist with questions, product selection or quotes. Please call us today at 800-231-7271 or email ELSales@endurocomposites.com.

Our Broad Experience

Offshore Platforms

Subsea Applications

Floating Offshore Systems
FPSOs & Other Vessels

Refineries

Liquefied Natural Gas (LNG)

Chemical Plants

Petrochemical Complex

Fertilizer, Potash Plants

Pulp & Paper

Copper Refineries

Aluminum Refineries

Zinc Refineries

Metal Plating Facilities

Desalination Plants

Salt Processing

Grain Refining

Food Processing

Water & Wastewater Treatment

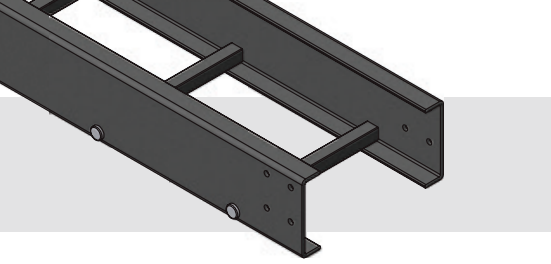
Electronics Etching/Clean Rooms

Tunnels, Bridges, Causeways

Non-Conductive Applications

Battery Manufacturing & Recycling

Rail Coverboard & Walkway



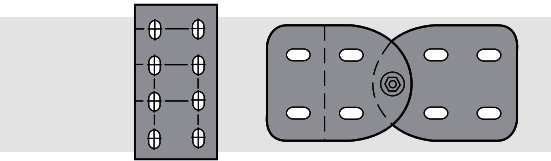
Ladder Cable Tray

PAGE 8-12



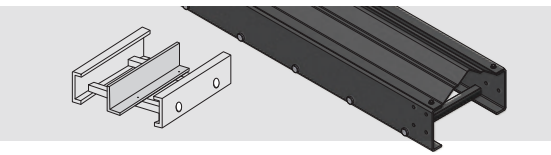
Ladder Cable Tray Fittings

PAGE 13-21



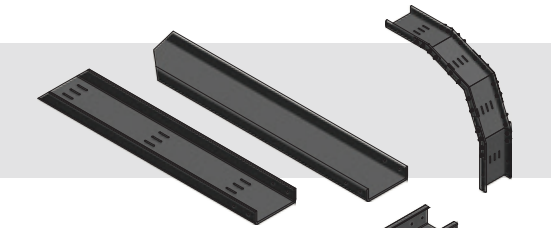
Ladder Cable Tray Splice Plates

PAGE 22-24



Ladder Cable Tray Accessories

PAGE 25-27



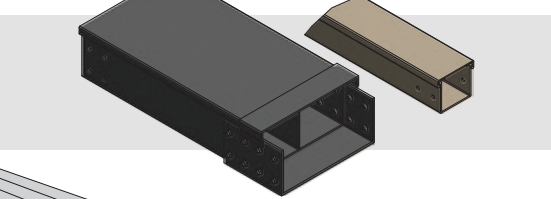
Channel-Type Instrumentation Tray

PAGE 28-31



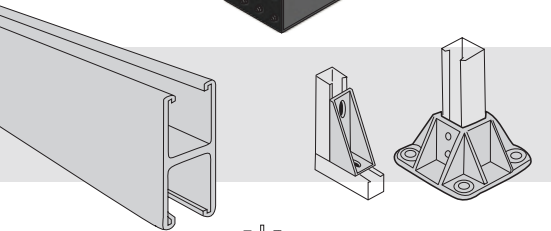
Flanged-Type Instrumentation Tray

PAGE 32-33



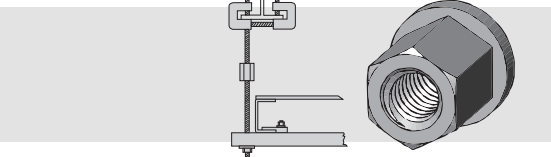
Wireway

PAGE 34-37



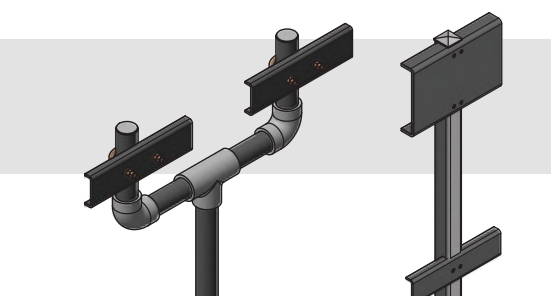
Support Systems & Strut

PAGE 38-41



Fastener & Hanger Systems

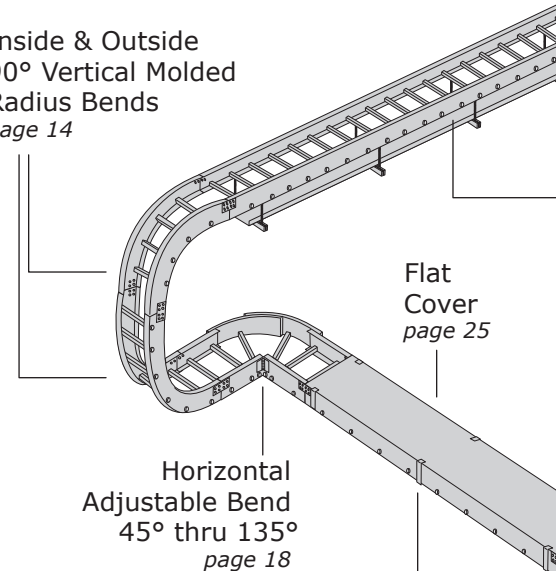
PAGE 42-43



Instrument & Push Button Stands

PAGE 44

Inside & Outside
90° Vertical Molded
Radius Bends
page 14

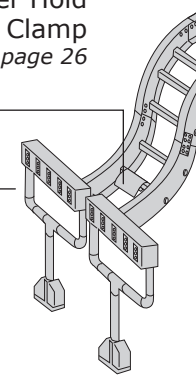


Horizontal
Adjustable Bend
45° thru 135°
page 18

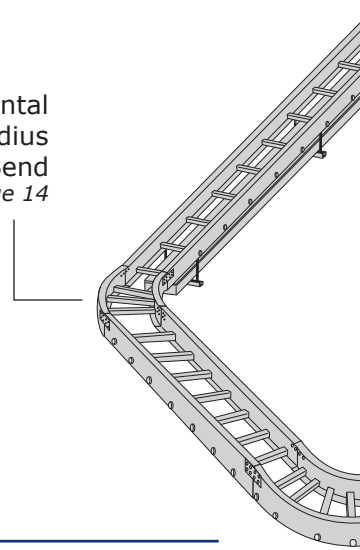
Flat
Cover
page 25

Drop Out
page 27

Instrument
Support Stands
page 44



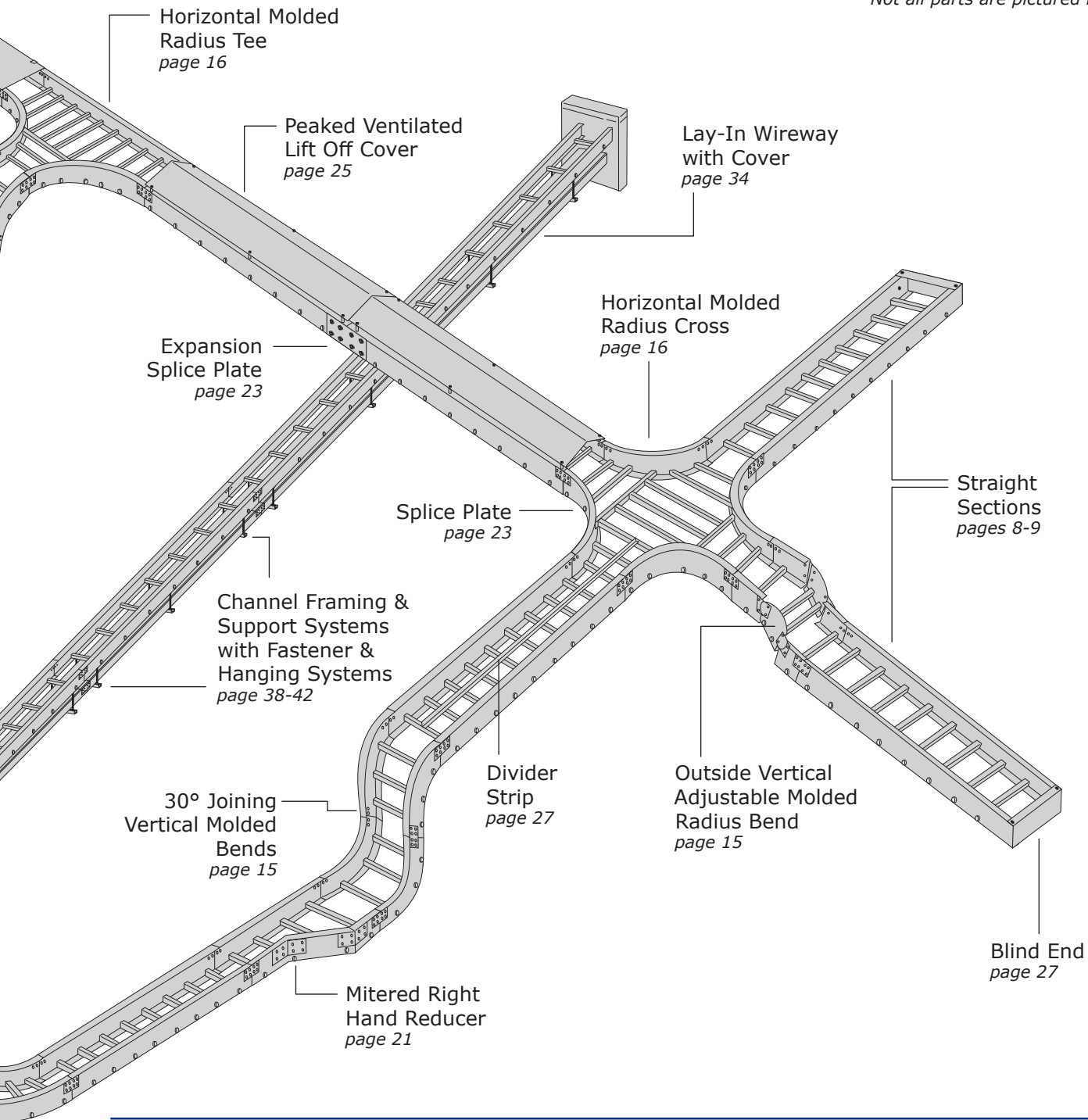
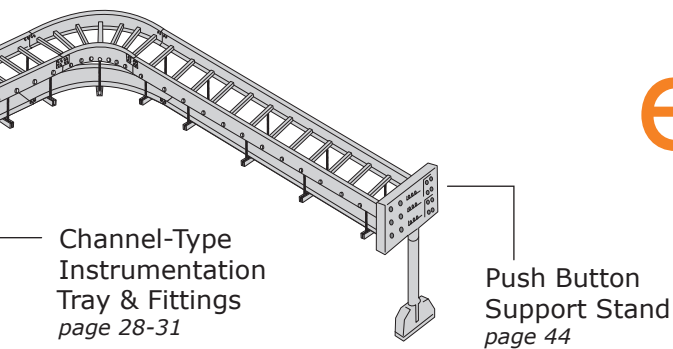
45° Horizontal
Molded Radius
Bend
page 14





Quick Find Index

This illustration is for parts visualization only and does not represent an actual layout. Not all parts are pictured here.



FRP/GRP Technical Data

Typical Properties of Structural FRP/GRP

Longitudinal Direction

Mechanical (coupon)	FR-P	FR-VE
Ultimate Tensile Strength, PSI (ASTM D638)	30,000	35,000
Ultimate Compressive Strength, PSI (ASTM D695)	30,000	35,000
Ultimate Flexural Strength, PSI (ASTM D790)	30,000	35,000
Tensile Modulus, PSI x 10 ⁶	2.5	3.0
Compressive Modulus, PSI x 10 ⁶	2.5	2.5
Flexural Modulus, PSI x 10 ⁶	1.6	2.0
Ultimate Shear Strength, PSI	5,500	7,000
Ultimate Bearing Stress, PSI	30,000	35,000
Izod Impact Strength, Ft.-Lbs. per inch of notch (ASTM D256) (sample thickness 1/8" except 1/4" for rod)	25	30

Transverse Direction

Mechanical (coupon)	FR-P	FR-VE
Ultimate Tensile Strength, PSI	7,000	10,000
Ultimate Compressive Strength, PSI	15,000	20,000
Ultimate Flexural Strength, PSI	10,000	14,000
Tensile Modulus, PSI x 10 ⁶	0.8	1.0
Compressive Modulus, PSI x 10 ⁶	1.0	1.2
Flexural Modulus, PSI x 10 ⁶	0.8	1.0
Ultimate Shear Strength, PSI	5,500	6,000
Ultimate Bearing Stress, PSI	30,000	35,000
Izod Impact Strength, Ft.-Lbs. per inch of notch (ASTM D256)	4	5
Barcol Hardness (ASTM D2583-75)	50	50

Electrical

Mechanical (coupon)	FR-P	FR-VE
Electric Strength, short term in oil, 1/8", vpm (ASTM D149)*	200	200
Electric Strength, short term in oil, KV per inch	35	35
Dielectric Constant, 60 Hz.(ASTM D150)*	5.6	5.2
Dissipation Factor, 60 Hz. (ASTM D150)*	0.03	0.03
Arc Resistance, seconds (ASTM D495)**	120	120

Full Section in Bending

Mechanical (coupon)	FR-P	FR-VE
Modulus of Elasticity, PSI x 10 ⁶	2.5	3.0
Tensile Strength, PSI	20,000	25,000
Compressive Strength, PSI	20,000	25,000

Fire Retardant Properties

Mechanical (coupon)	FR-P	FR-VE
Flame Resistance, ign/burn, seconds (FTMS 406-2023)	75/75	75/75
Intermittent Flame Test, rating (HLT-15)	100	100
Flammability Test average time of burning 5 seconds, average extent of burning 15mm (ASTM D635)		
Surface Burning Characteristics, maximum (ASTM E84)	25	25

Thermal

Mechanical (coupon)	FR-P	FR-VE
Thermal Coefficient of Expansion Inches/Inch/°F (ASTM D696)**	5 x 10 ⁻⁶	5 x 10 ⁻⁶
Thermal Conductivity, BTU per Sq. Ft./Ht./°F/In. (ASTM C-177-76)	4	4
Specific Heat, BTU/Lb./°F	0.28	0.28

Other

Mechanical (coupon)	FR-P	FR-VE
Density, Lbs./In. ³ (ASTM D792)	0.065	0.065
Specific Gravity (ASTM D792)	1.80	1.80
Water Absorption, Max. % by weight (24 hour immersion) (ASTM D570)	.50	.50

Note: 1 PSI = 6.894 K Pa; 1 Ft.-Lb./In. = 5.443 kg-m/m; * Specimen tested perpendicular to laminate face ** Indicates reported value measured in longitudinal direction; Depending on the specific glass content and resin, the strength and stiffness properties may be significantly higher. Contact us for specific values on Halogen-Free Low Smoke Plus resin properties.

Concentric Static Load (if required)

A concentrated static load is not included in the table on page 9. Some user applications may require that a given concentrated static load be imposed over and above the working load. Such concentrated static load represents a static weight applied between the side rail at midspan. When so specified, the concentrated static load may be converted to an equivalent load (W_e) in pounds per linear foot (kg/m) using the formula to the below right and added to the static weight of cable in the tray. This combined load may be used to select a suitable load/span designation (table on page 9).

If the combined load exceeds the working load shown, please contact us. This data was obtained from the NEMA and NEC Standards Publications and other sources to assist in the proper selection of the most appropriate cable tray type offered by Enduro.

$$W_e = \frac{2 \times (\text{Concentrated Static Load})}{\text{span length (ft or m)}}$$

Thermal Contraction & Expansion

The table to the right compares the thermal contraction and expansion based on various temperature differentials for fiberglass, steel and aluminum cable trays. The values shown represent the length of cable tray that will produce a 5/8" movement between expansion connectors for the indicated temperature differential. Fiberglass has the least movement. Enduro has expansion connectors to provide for total movement of 5/8".

Fiberglass vs Steel vs Aluminum

Temp. Differential	Fiberglass Ft. (m)	Steel Ft. (m)	Aluminum Ft. (m)
25°F (14°C)	417 (126)	320 (97)	162 (49)
50°F (28°C)	208 (63)	160 (48)	81 (25)
75°F (42°C)	138 (42)	106 (32)	54 (16)
100°F (56°C)	104 (32)	80 (24)	40 (12)
125°F (69°C)	83 (25)	63 (19)	32 (10)
150°F (83°C)	69 (21)	53 (16)	26 (8)
175°F (97°C)	59 (17)	45 (13)	23 (6)

Effect of Temperature - FRP/GRP

Strength properties of reinforced plastics are reduced when continuously exposed to elevated temperatures. Working loads shall be reduced when based on the table to the right. Percentages shown are approximate. If unusual temperature conditions exist, please contact us for consultation. Below freezing temperatures do not adversely affect the load rating capability of the tray. Fiberglass does not become brittle at below freezing temperatures. Careful review should be made of applications involving service temperatures over 200°F.

Temp.	Polyester Strength %	Vinyl Ester Strength %
75°F (24°C)	100%	100%
100°F (38°C)	90%	100%
125°F (52°C)	78%	100%
150°F (66°C)	68%	90%
175°F (79°C)	60%	90%
200°F (93°C)	52%	75%

The test values in the chart below were obtained from tests conducted by Enduro's vinyl ester resin supplier. The values shown, although obtained from an actual coupon test, are intended for illustrative purposes only, and not for use in design calculations. The values for polyester are slightly lower.

Test Temp. °F (°C)	-100° (-73°)	-50° (-46°)	0° (-18°)	50° (10°)	77° (25°)	100° (38°)	150° (66°)	200° (93°)	250° (121°)	300° (149°)
Flex. St., PSI, ASTM D790	101,500	86,400	79,500	72,300	68,100	66,300	58,700	27,400	13,200	9,200
Flex. Mod., PSI x 10 ⁶ , ASTM D790	3.36	3.32	3.42	3.38	3.24	3.29	3.07	1.98	0.98	0.83
Tensile St., PSI, ASTM D638	84,100	70,400	63,900	58,000	56,100	54,600	49,900	41,800	29,600	22,000

Corrosion Resistance of Resin Systems

Enduro offers a variety of resin systems which are listed in more detail on page 9. The two resin systems most often used are isophthalic polyester fire-retardant (FR-P) and vinyl ester fire-retardant (FR-VE). Polyester is more widely used and sufficient for most applications while vinyl ester is recommended where strong acids (such as hydrochloric acid), strong alkalies (such as caustic soda), organic solvents and organic conditions exist. An abbreviated guide is provided below to assist in the selection of the proper standard resin system for individual application.

Polyester and vinyl ester resin systems are available in conductive formulation. Contact us for corrosion resistance information for halogen-free and halogen-free low smoke plus resins.

All composite materials have an ultra-violet light inhibiting chemical additive and has a maximum flame spread of 25 or less, per ASTM E-84 (Class 1 flame spread). All pultruded products have complete synthetic veil coverage (outer surfacing fabric) to provide maximum chemical and UV protection.

Chemicals	75°F (24°C)	160°F (71°C)	Chemicals	75°F (24°C)	160°F (71°C)
Acetic Acid 5%	FR-P	FR-P	Magnesium Chloride	FR-P	FR-P
Acetic Acid 25%	FR-P	FR-VE-210° (*)	Methyl Alcohol 10%	FR-P	FR-VE-150° (*)
Aluminum Potassium Sulfate 5%	FR-P	FR-P	Naphtha	FR-P	FR-P
Ammonium Hydroxide 10%	FR-P	FR-VE-150°	Nitric Acid 5%	FR-P	FR-P
Ammonium Nitrate	FR-P	FR-P	Nitric Acid 20%	FR-VE	FR-VE-120° (*)
Benzenesulfonic Acid 5%	FR-P	FR-P	Phosphoric Acid 10%	FR-P	FR-P
Calcium Chloride	FR-P	FR-P	Phosphoric Acid 30%	FR-P	FR-P
Carbon Tetrachloride	FR-VE	FR-VE-100° (*)	Phosphoric Acid 85%	FR-P	FR-P
Chlorine Dioxide 15%	FR-P	FR-VE-150° (*)	Sodium Bicarbonate 10%	FR-P	FR-P
Chromic Acid 5%	FR-P	FR-VE-150° (*call)	Sodium Bisulfate	FR-P	FR-P
Copper Sulfate	FR-P	FR-P	Sodium Carbonate	FR-P	FR-VE
Diesel Fuel No. 1	FR-P	FR-P	Sodium Chloride	FR-P	FR-P
Diesel Fuel No. 2	FR-P	FR-P	Sodium Hydroxide 1-50%	FR-VE	FR-VE-120° (*)
Ethylene Glycol	FR-P	FR-P	Sodium Hypochlorite 5%	FR-P	FR-VE-120° (*)
Fatty Acids 100%	FR-P	FR-P	Sodium Nitrate	FR-P	FR-P
Ferrous Sulfate	FR-P	FR-P	Sodium Silicate	FR-P	FR-VE-210° (*)
Fluosilicic Acid 0-20%	FR-VE	FR-VE (call)	Sodium Sulfate	FR-P	FR-P
Hydrochloric Acid 1%	FR-P	FR-P	Sulfuric Acid 0-30%	FR-P	FR-P
Hydrochloric Acid 15%	FR-P	FR-VE-180° (*)	Sulfuric Acid 30-50%	FR-VE	FR-VE
Hydrochloric Acid 37%	FR-P	FR-VE-150° (*)	Sulfuric Acid 50-70%	FR-VE	FR-VE-180° (*)
Hydrogen Sulfide	FR-P-140°	FR-VE-210°	Trisodium Phosphate 25%	FR-P	FR-VE-210° (*)
Kerosene	FR-P	FR-P	Trisodium Phosphate - All	FR-VE	FR-VE-210° (*)
Lithium Carbonate	FR-P	FR-VE	Water, Distilled	FR-P	FR-P
Lithium Hydroxide	FR-VE	FR-VE-120°(*)			

FR = Fire-Retardant; P = Polyester Resin; VE = Vinyl Ester Resin; (*) = Not recommended to exceed this temperature; call = Call for recommendations
 Information contained in this chart is based on data from raw material suppliers and collected from several years of actual industrial applications. Temperatures are not the minimum nor the maximum (except where specifically stated) but represent standard test conditions. The products may be suitable at higher temperatures, but individual test data should be required to establish such suitability. The recommendations or suggestions contained in this chart are made without guarantee or representation as to results. We suggest that you evaluate these recommendations and suggestions in your own laboratory or by actual field trial prior to use.

Ladder Cable Tray Selection Guide

Imperial Straight Section Part Numbers

TYPE - (W) - (RS) - (L)

Example: EHL6 - 06 - 06 - 20

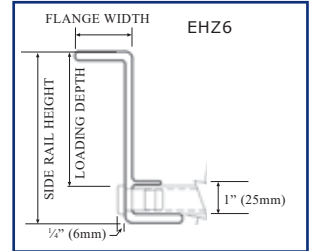
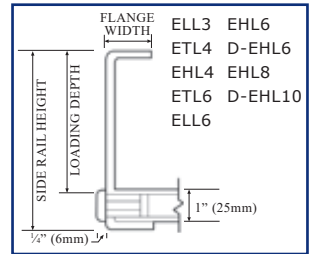
System No.	Side Rail Height	Width	Rung Spacing	Length
See Ladder Cable Tray Selection Guide Below	3=3"	06=6"	06=6"	10=10 Ft.
	4=4"	09=9"	09=9.25"	20=20 Ft.
	6=6"	12=12"	12=12"	
	8=8"	18=18"	18=18.5"	
	10=10"	24=24"		
		30=30"		
		36=36"		

Tray supplied with standard rung.

For Marine Rung, add "MR" at the end of part number. Example: EHL6-06-06-20-MR

Strut rung available upon request.

System Diagrams



Width represents inside dimensions.

Solid bottom available upon request. Rung connections are made with a mechanical and chemical lock. See specification page 12, item 5.1.2 for details.

Please contact us for any other custom modifications.

18.5" (470mm) rung spacing not available for 30" (750mm) and 36" (900mm) widths.

Metric Straight Section Part Numbers

TYPE - (W) - (RS) - (L)

Example: EHL6 - 150 - 150 - 6M

System No.	Side Rail Height	Width	Rung Spacing	Length
See Ladder Cable Tray Selection Guide Below	3=3"	150=150mm	150=150mm	3M=3m
	4=4"	225=225mm	235=235mm	6M=6m
	6=6"	300=300mm	300=300mm	
	8=8"	450=450mm	470=470mm	
	10=10"	600=600mm		
		750=750mm		
		900=900mm		

Tray supplied with standard rung.

For Marine Rung, add "MR" at the end of part number. Example: EHL6-150-150-6M-MR

Strut rung available upon request.

Ladder Cable Tray Selection Guide

Standard System Number (Polyester Resin)	Optional Sys. Number (Δ)=insert code; see bottom of pg.	Side Rail Height In. (mm)*	Loading Depth In. (mm)*	Flange Width In. (mm)*	Min. Channel Thickness In. (mm)*	NEMA Class	Safety Factor	UL Listing
ELL3	EL(Δ)3	3" (75)	1 ¹³ / ₁₆ " (46)	1" (25)	³ / ₁₆ " (4.8)	8A	1.5	-
EHL4	EH(Δ)4	4" (100)	2 ³ / ₄ " (70)	1 ¹ / ₈ " (28)	¹ / ₄ " (6.4)	12C	1.5	Class C
EHL6	EH(Δ)6	6" (152)	4 ³ / ₄ " (121)	1 ⁵ / ₈ " (41)	¹ / ₄ " (6.4)	20C	1.5	Class C
D-EHL6	D-EH(Δ)6	6" (152)	4 ¹ / ₁₆ " (119)	1 ⁵ / ₈ " (41)	⁵ / ₁₆ " (8.0)	20C	1.5	Class C
EHZ6	EHZ(Δ)6	6" (152)	4 ¹ / ₁₆ " (119)	2" (51)	¹ / ₄ " (6.4)	20C	1.5	-
EHL8	EH(Δ)8	8" (203)	6 ¹ / ₁₆ " (170)	1 ³ / ₄ " (44)	⁵ / ₁₆ " (8.0)	20C	1.5	Class C
D-EHL10	D-EH(Δ)10	10" (254)	8 ⁵ / ₈ " (219)	2 ³ / ₄ " (70)	³ / ₈ " (9.5)	30C	2.0	-

(Δ) = Insert one of the following letters for resin designation

V = Vinyl Ester; S = Halogen-Free Polyester; VS = Halogen-Free Vinyl Ester;
Y = Halogen-Free Low Smoke Plus; RT = Conductive

* (mm) value is nominal.

Please note: Custom resin systems may require additional lead times.

Ladder Cable Tray Selection Guide

Resin Systems

Below is an overview of the common resin systems we offer. When choosing a resin type for your application, we highly recommend consulting with us regarding the application to be sure the proper resin is specified. Considerations include corrosion environment, temperature, fire resistance, smoke and smoke toxicity requirements and conductivity / resistivity requirements. Regarding the corrosion environment, certain chemical concentrations and temperatures will dictate whether a polyester or epoxy vinyl ester system is preferred for optimum durability.

Isophthalic Polyester This industrial-grade polyester resin system offers very good weathering performance (resistance to UV) and corrosion resistance. This system is especially suitable for seawater environments.

Vinyl Ester This resin system also delivers good weathering performance, but is superior to a polyester with respect to corrosion resistance and high heat environments. Epoxy vinyl ester resins provide greater toughness and considerably higher strength at elevated temperatures. They also provide superior resistance to chemical attack in corrosive chemical service.

Conductive This Isophthalic Polyester-based resin is formulated to comply with ABS requirements for conductivity. To provide superior resistance to chemical attack, the conductive formulation is also available in a Vinyl Ester base.

Halogen-Free Polyester This system offers similar performance attributes as our standard Isophthalic Polyester, but without the use of halogens.

Halogen-Free Vinyl Ester This system offers similar performance attributes as our Vinyl Ester, but without the use of halogens.

Halogen-Free Low Smoke Plus This modified-acrylic based resin is suitable for applications which require extremely low-smoke development in the case of fire. This resin system is commonly used in tunnel applications.

Tray Weight Lbs/Ft. (kg/m) 12" width, 12" rung spacing	Working (Allowable) Load Lbs./Ft. (kg/m)								
	8' (2.4m)	10' (3m)	12' (3.7m)	14' (4.3m)	16' (4.9m)	18' (5.5m)	20' (6.1m)	30' (9.1m)	
2.0 (3.0)	50 (74)								
3.0 (4.5)	205 (303)	144 (214)	100 (148)						
4.5 (6.7)				204 (228)	156 (233)	123 (184)	100 (149)		
4.9 (7.3)				272 (405)	208 (310)	164 (244)	133 (198)		
4.8 (7.1)				204 (304)	156 (233)	123 (184)	100 (149)		
6.4 (9.5)				204 (304)	156 (233)	123 (184)	100 (149)		
9.4 (14.1)						278 (413)	225 (335)	100 (149)	

Enduro straight sections that are UL Listed are for 10' and 20' lengths. All molded and mitered fittings associated with these tray types are also UL listed. NEMA classes and UL listings in this table are for polyester and vinyl ester resin systems only. Values in Working (Allowable) Load are applicable to all resin systems. To convert 2.0 safety factor to NEMA standard 1.5 for "+" load class, multiply published load by 1.33. +Working (Allowable) Load exceeds standard NEMA load classification.

Installation Guide - Ladder Cable Tray

Installation

The installation of Enduro Cable Tray should be made in compliance with the standards set forth by the National Electric Code and NEMA Publications VE-2 (current issue). Enduro supplies made to order, pre-fabricated cable ladder tray and fittings as specified by the purchaser.

Always observe common safety practices when assembling tray and fittings in the field. Assemble in well-ventilated areas as dust from field cuts can accumulate. This presents no serious health hazard but can cause skin irritation and, if allowed to accumulate with grease and other machining lubricants, can become abrasive. Personnel should wear safety goggles, dust mask, coveralls or a shop coat when sawing, machining and/or sanding. Caution should also be noted when cutting as dust from carbon fiber is also electrically conductive and additional considerations apply.

Avoid generating excessive heat in any machining operation, as heat softens the bonding resin in the

fiberglass, resulting in a ragged rather than a clean-cut edge.

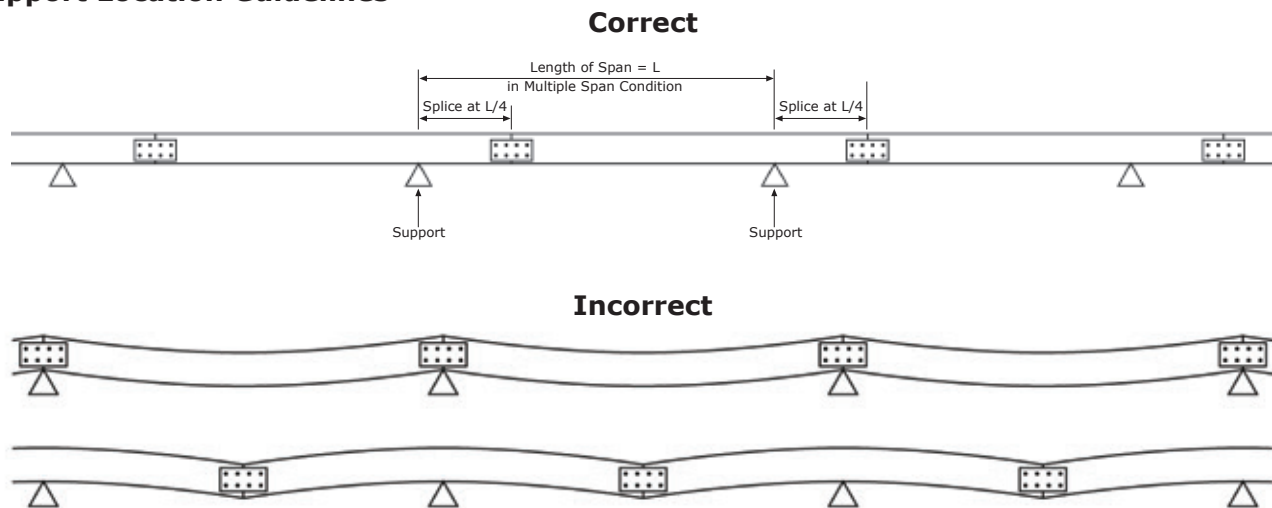
Avoid excessive pressure when sawing, drilling, routing, etc. Use carbide-tipped drill bits and saw blades for extended tool life.

The use of lubricant during machining is not recommended.

To avoid chipping of material at cut edges, secure cable tray and fittings properly during field cut operations. We recommend the use of Enduro sealant (pg. 25) for sealing surfaces and cut edges after field cuts are made.

When using adhesives, be sure to prepare the surface properly before applying. Follow label instructions carefully. A combination of mechanical fasteners and adhesives make the strongest most reliable connections.

Support Location Guidelines*



*These guidelines apply when using standard splice plates. For location flexibility, heavy duty splice plates (pg. 22) allow for support location anywhere in the span.

WARNING
NOT TO BE USED
AS A WALKWAY

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.

ENDURO COMPOSITE SYSTEMS HOUSTON, TEXAS

WARNING! CABLE TRAYS ARE NOT DESIGNED FOR USE AS WALKWAYS

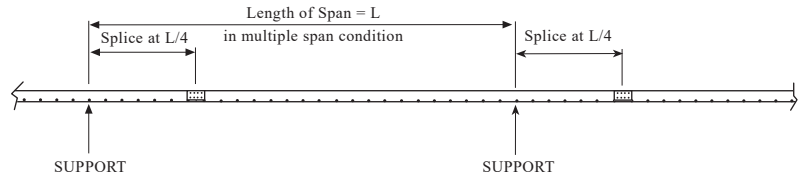
Reference NEMA VE-2 (current issue)
In as much as fiberglass cable tray is designed as a support for power or control cables, or both; it is not intended or designed to be a walkway for personnel. The user is urged to display appropriate warning cautioning against the use of this support as a walkway.

Actual Size Label

Ladder Cable Tray - Installation Guide

Straight Sections

Supports must be located so that connector (splice joints) between horizontal runs fall between the support point and the quarter point of the span.



Standard engineering practice requires that the splice joints be located where they will resist little or no bending moment. This allows the cable tray system to act as a continuous member with spans working in conjunction with one another to resist loading. When a cable tray system is installed with the splice joints located directly over the support, the previous continuous span condition is changed to one of a number of simple spans.

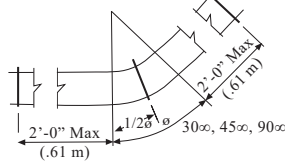
These spans act independently of each other and excessive stress will occur at substantially less loading.

Vertical straight lengths should be supported at intervals dictated by the building structure not exceeding 24 Ft. on centers.

A support should be located 2 Ft. on each side of an expansion connection.

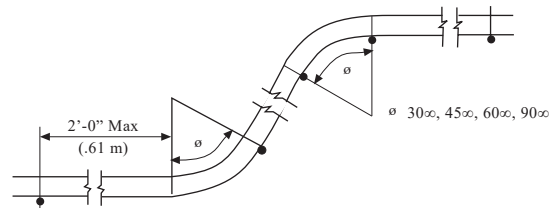
Horizontal Fitting Supports

Supports should be placed within 2 Ft. (.61m) 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 the 12" radii), 30 degree supports at the 15 degree point of the arc (except for the 12" radii).



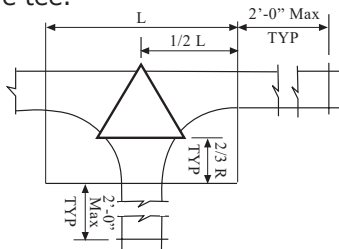
Vertical Fitting Supports

Vertical fittings at the top runs should be supported at each end. Fittings at the bottom of runs should be supported at the top of the fitting, and within 2 Ft. (.61m) of the lower extremity of the fitting.



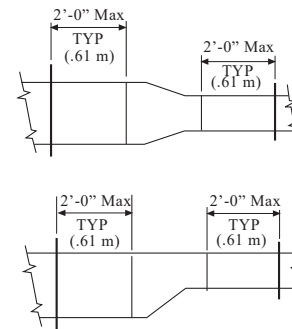
Horizontal Tee Supports

Supports should be placed within 2 Ft. (.61m) of each of the three openings connected to other cable tray items for 12" (305mm) radius. On all other radii, at least one support should also be placed under each side rail of the tee.



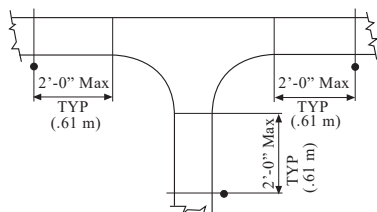
Reducer Fitting Supports

Straight reducer and right/left hand reducer fittings should be supported within 2 Ft. (.61m) of each fitting extremity.



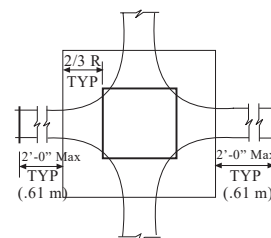
Vertical Tee Supports

Vertical tee fittings should be supported within 2 Ft. (.61m) of each fitting extremity.



Horizontal Cross Supports

Supports should be placed within 2 Ft. (.61m) of the four openings connected to other cable tray items for the 12" (305mm) radius. On all other radii, at least one support should also be placed under each side rail of the cross.



Specification - Ladder Cable Tray

Specification

1.0 Scope

1.1 The cable tray system shall conform to the material and fabrication requirements as per this specification.

2.0 Standards

2.1 The cable tray system shall conform to applicable sections of:

- 2.1.1 NEMA Standard FG-1 (latest edition)
- 2.1.2 National Electric Code (NEC)
- 2.1.3 ASTM E-84 (Class 1 Rating)
- 2.1.4 UL (Underwriters Laboratories, Inc.) Standards for Non-Metallic Cable Trays.
- 2.1.5 CSA INTERNATIONAL (National Standard of Canada) CAN/CSA-C22.2 No. 126 Cable Tray Systems

3.0 General

3.1 Tray Requirements

- 3.1.1 Tray widths 6" (152mm), 9" (229mm), 12" (305mm), 18" (457mm), 24" (610mm), 30" (762mm), and 36" (914mm)
- 3.1.2 Lengths (as required): 10 ft, 20 ft, 3m, and 6m
- 3.1.3 Rung spacing (as required): 6" (152mm), 9.25" (235mm), 12" (305mm), and 18.5" (470mm)
Rung Type (as required): Standard Rung, Marine Rung or Strut Rung
- 3.1.4 Radius of fittings (as required): 12" (305mm), 24" (610mm), and 36" (914mm)
- 3.1.5 Resin Systems (as required): Isophthalic Polyester, Vinyl Ester, Conductive, Halogen-Free Polyester, Halogen-Free Vinyl Ester, or Halogen-Free Low Smoke Plus

3.2 Loading Requirements

3.2.1 There shall be three working load classifications of fiberglass cable tray based on 20 Ft. (6m) support span:

Class	Working Load	FOS
A	50 Lbs./Lineal Ft.	1.5
B	75 Lbs./Lineal Ft.	1.5
C	100 Lbs./Lineal Ft.	1.5

3.2.2 Span support criteria shall be as specified (Reference the following table)

Support Span (Ft.)	Working Load in Lbs./Lineal Ft.		
	Class A	Class B	Class C
30	-	-	100
20	50	75	100
18	62	92	123
16	78	117	156
14	102	150	200
12	139	208	-
10	200	-	-

• Independent test reports in conformance to NEMA FG-1 are required.

3.2.3 Nominal loading depth (as required): 2" (51mm), 3" (76mm), 5" (127mm), 7" (178mm) and 9" (229mm)

4.0 Materials

4.1 The glass fiber to resin content shall be maintained between 45 to 55 percent by weight in all pultruded components except flat sheet which shall be 35 to 45 percent; and, 25 to 45 percent by weight in all molded components.

4.2 All composite material shall have an ultraviolet light inhibiting chemical additive to resist UV degradation.

4.3 All composite material shall be fire retardant and have a flame spread rating of 25 or less (Class 1 Rating) when tested in accordance with ASTM E-84.

4.4 All pultruded products shall have a complete surfacing veil to provide maximum chemical and UV protection.

5.0 Construction

5.1 Straight section tray shall be fiberglass reinforced meeting all the requirements herein described.

- 5.1.1 The side rail members must turn in.
- 5.1.2 All rung to side member connections shall have both a mechanical and a chemical (adhesive) lock. The tray shall be assembled by the use of a locking pin made of fiberglass reinforced thermoplastic. The locking pin shall be inserted under pressure with a high strength, chemical resistant adhesive.
- 5.1.3 All bonded connections must be sanded to maximize adhesion and structural integrity.
- 5.1.4 The tray interior shall be clear of all projections or sharp objects.
- 5.1.5 All straight section lengths shall be pre-drilled to accept connector plates.
- 5.1.6 All cut ends and drilled holes (factory and field) shall be resin coated.

5.2 Fittings are to be pre-fabricated and shall meet all the requirements herein described.

- 5.2.1 All fittings shall have a nominal 9.25" rung spacing.
- 5.2.2 All fittings shall be pre-drilled to accept connector plates.
- 5.2.3 All fittings shall be designed and installed so as to have the same load carrying capacity as the straight sections.
- 5.2.4 Rung to side member connections shall have both a mechanical and/or chemical (adhesive) lock. Fittings shall be assembled by use of a locking pin made of fiberglass reinforced thermoplastic and/or a stainless steel rivet. The locking pin shall be inserted under pressure with a high strength chemical resistant adhesive.

- All radius 90° and 45° horizontal and vertical bends, all tees and crosses for tray types using 6" (152mm), and most 4" (101mm) and 8" (202mm), C-channel members shall be of concentric curved molded design and made by resin transfer molding.

5.3 Connector Plates and Fasteners:

- 5.3.1 Connector plates shall be fiberglass and designed with sufficient strength so they may be installed between 0.2 and 0.3 of the length of the span from the support without derating the load carrying capacity of the tray.
- 5.3.2 Connector plates for conductive tray shall be stainless steel.
- 5.3.3 Fasteners for connector plates shall be 3/8" (9.5mm) diameter Type 316 Stainless Steel, Monel, Silicon, Bronze, or FRP/GRP studs & hex nuts as required.

5.4 Accessories

- 5.4.1 The manufacturer shall be capable of providing all necessary parts (i.e. clamps, support assemblies, etc.) for the installation of a complete fiberglass tray system.


6.0 Acceptable Manufacturer

6.1 The fiberglass ladder-type cable tray system shall be manufactured - pultrusion, compression molded, resin transfer molded and/or fabricated by Enduro Composites, Inc., of Houston, Texas USA.

Ladder Cable Tray - Molded Fittings

Enduro concentric curved molded fittings are available in polyester and vinyl ester. **For conductive and halogen-free formulations, please contact us for availability and lead time.** It is recommended to use expansion splice plates and 1¼" long assembly fasteners when connecting to other fittings or straight lengths. Refer to page 11 in the Recommended Support Locations section. Rung connections are made with a mechanical and/or chemical lock. Please see page 12, item 5.2.4 for details.

Standards & Listings

NEMA: All 6" and 8" molded fittings = Class C. EHL 4" molded fittings = Class 20A **NEMA** 

UL: All the following molded fittings are UL listed in 4", 6", and 8" in Polyester/Vinyl Ester.

Imperial Molded Fittings Part Numbers

TYPE - (Δ)(H) - (A) - (W) - (R)

Example: **EHB - MC6 - 90 - 24 - 24**

Type	Resin (Δ)	Side Rail Height (H)	Angle (A)	Width (W)	Radius (R)
EHB = Horizontal Bend	MC = Polyester	4 = 4"	30 = 30°	06 = 6"	12 = 12"
EIV = Vertical Inside	MV = Vinyl Ester	6 = 6"	45 = 45°	09 = 9"	24 = 24"
EOV = Vertical Outside	MRT = Conductive	8 = 8"	60 = 60°	12 = 12"	36 = 36"
EHT = Horizontal Tee	MS = Poly Halogen-Free		90 = 90°	18 = 18"	
EHC = Horizontal Cross				24 = 24"	
EVT = Vertical Tee For vertical tee specify "up" or "down" at end of catalog code				30 = 30"	
				36 = 36"	

Covers = EC before part number; example EC-EHB-MC6-90-24-24. Fasteners for covers are separate order item, see page 43.
 Strut Rung = SR after part number; example EHB-MC6-90-24-24-SR. Marine Rung = MR after part number; example EHB-MC6-90-24-24-MR
 For molded fitting availability, please see pages 13-16.

Metric Molded Fittings Part Numbers

TYPE - (Δ)(H) - (A) - (W) - (R)

Example: **EHB - MC6 - 90 - 600 - 600**

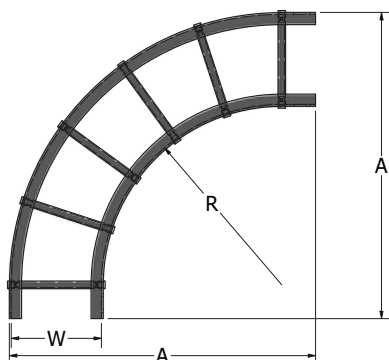
Type	Resin (Δ)	Side Rail Height* (H)	Angle (A)	Width (W)	Radius (R)
EHB = Horizontal Bend	MC = Polyester	4 = 100mm	30 = 30°	150 = 150mm	300 = 300mm
EIV = Vertical Inside	MV = Vinyl Ester	6 = 150mm	45 = 45°	225 = 225mm	600 = 600mm
EOV = Vertical Outside	MRT = Conductive	8 = 200mm	60 = 60°	300 = 300mm	900 = 900mm
EHT = Horizontal Tee	MS = Poly Halogen-Free		90 = 90°	450 = 450mm	
EHC = Horizontal Cross				600 = 600mm	
EVT = Vertical Tee For vertical tee specify "up" or "down" at end of catalog code				750 = 750mm	
				900 = 900mm	

* = (mm) values are nominal. Covers = EC before part number; example EC-EHB-MC6-90-600-600. Fasteners for covers are separate order item, see page 43.
 Strut Rung = SR after part number; example EHB-MC6-90-600-600-SR. Marine Rung = MR after part number; example EHB-MC6-90-600-600-MR

90° Horizontal Bend

Part No. Key*

EHB-(Δ)(H)-90-(W)-(R)



Width	Dimension Inches (mm)					
	12" (305) Radius		24" (610) Radius		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	22¾	32¾ ₁₆	34¾ ^{***}	49½	46¾	66⅛
9 (229)	25¾	36¾ ₁₆	37¾	53¾	49¾	70¾
12 (305)	28¾	40 ¹¹ / ₁₆	40¾ ^{**}	57¾	52¾	74¾
18 (457)	34¾	49½	46¾ ^{**}	66⅛	58¾	83⅛
24 (610)	40¾	57¾	52¾ ^{**}	74¾	64¾	91½
30 (762)	46¾	66⅛	58¾ [†]	83⅛	NA	NA
36 (914)	52¾	74¾	64¾ [†]	91½	NA	NA

NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall; ** Also available in 4" and 8" side rail; *** Also available in 4" side rail; † Also available in 8" side rail

Molded Fittings - Ladder Cable Tray

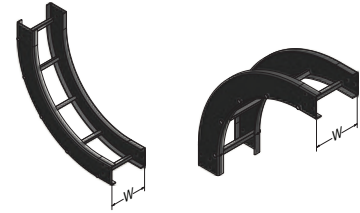
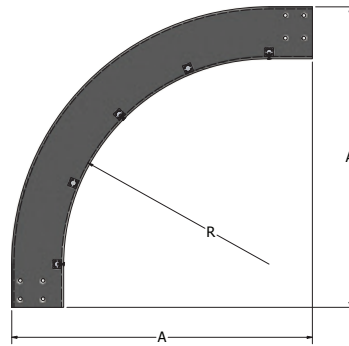
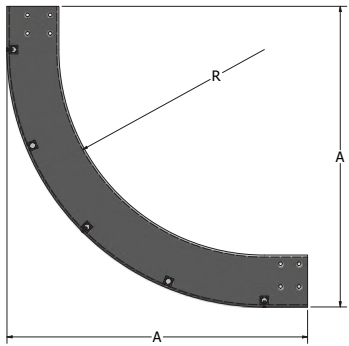
90° Vertical Bend

Part No. Key*

INSIDE: EIV-(Δ)(H)-90-(W)-(R)

Part No. Key*

OUTSIDE: EOY-(Δ)(H)-90-(W)-(R)



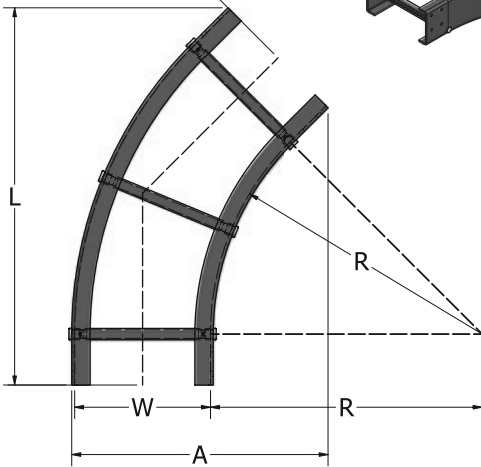
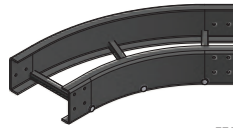
Channel Depth Inches (mm)

Radius	4" Tray		6" Tray		8" Tray	
	A	L	A	L	A	L
12 (305)	NA	NA	22 ³ / ₄ (578)	32 ³ / ₁₆ (818)	NA	NA
24 (610)	32 ¹³ / ₁₆ (833)	46 ³ / ₈ (1178)	34 ³ / ₄ (883)	49 ³ / ₈ (1356)	36 ¹ / ₁₆ (932)	51 ⁷ / ₈ (1318)
36 (914)	NA	NA	46 ³ / ₄ (1187)	66 ¹ / ₈ (1680)	NA	NA

45° Horizontal Bend

Part No. Key*

EHB-(Δ)(H)-45-(W)-(R)



Dimension Inches (mm)

Width	12" (305) Radius		24" (610) Radius		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	13 ¹ / ₈ (333)	20 ⁹ / ₁₆ (522)	16 ⁵ / ₈ (422)	29 ¹ / ₁₆ (738)	20 ⁷ / ₈ (511)	37 ⁹ / ₁₆ (954)
9 (229)	16 ¹ / ₈ (410)	22 ¹¹ / ₁₆ (576)	19 ⁵ / ₈ (498)	31 ³ / ₁₆ (792)	23 ¹ / ₈ (587)	39 ¹¹ / ₁₆ (1008)
12 (305)	19 ¹ / ₈ (486)	24 ¹³ / ₁₆ (630)	22 ⁵ / ₈ (575)	33 ⁵ / ₁₆ (846)	26 ¹ / ₈ (664)	41 ¹³ / ₁₆ (1062)
18 (457)	25 ¹ / ₈ (638)	29 ¹ / ₁₆ (738)	28 ³ / ₈ (727)	37 ¹ / ₈ (954)	32 ¹ / ₈ (816)	46 ¹ / ₁₆ (1170)
24 (610)	31 ¹ / ₈ (791)	33 ³ / ₁₆ (846)	34 ³ / ₈ (879)	41 ¹³ / ₁₆ (1062)	38 ¹ / ₈ (968)	50 ³ / ₁₆ (1278)
30 (762)	37 ¹ / ₈ (943)	37 ⁹ / ₁₆ (954)	40 ³ / ₈ (1032)	46 ¹ / ₁₆ (1170)	N/A	N/A
36 (914)	43 ¹ / ₈ (1095)	41 ¹³ / ₁₆ (1062)	46 ³ / ₈ (1184)	50 ³ / ₁₆ (1278)	N/A	N/A

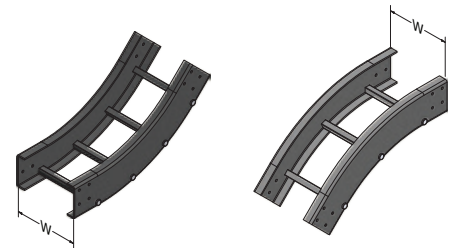
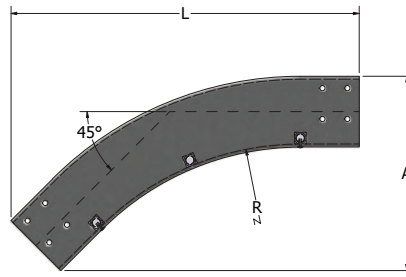
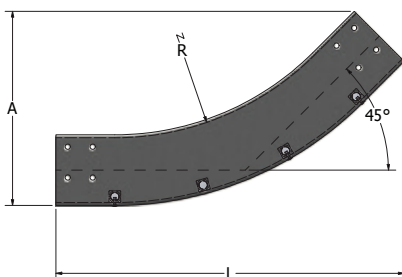
45° Vertical Bend

Part No. Key*

INSIDE: EIV-(Δ)(H)-45-(W)-(R)

Part No. Key*

OUTSIDE: EOY-(Δ)(H)-45-(W)-(R)



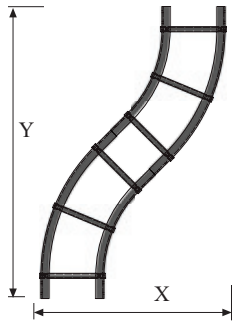
Channel Depth Inches (mm)

Radius	4" Tray		6" Tray		8" Tray	
	A	L	A	L	A	L
12 (305)	NA	NA	13 (330)	21 ¹ / ₁₆ (535)	NA	NA
24 (610)	NA	NA	16 ¹ / ₂ (419)	29 ⁹ / ₁₆ (751)	18 ¹ / ₂ (470)	30 ¹⁵ / ₁₆ (786)
36 (914)	NA	NA	NA	NA	NA	NA

NOTE: mm values are nominal; * In Part No. Key, any parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall; ** Also available in 4" and 8" side rail; *** Also available in 4" side rail; † Also available in 8" side rail

Ladder Cable Tray - Molded Fittings

Joining 45° Horizontal Bends

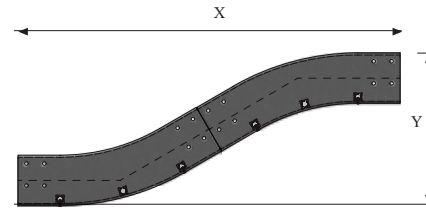


$$X = 2A - .707 (W + .5)$$

$$Y = 2L - .707 (W + .5)$$

Contact us for assembly method.

Joining 45° Vertical Bends



6" Side Rail
 $X = 2L - 4.24"$
 $Y = 2A - 4.24"$

8" Side Rail
 $X = 2L - 5.66"$
 $Y = 2A - 5.66"$

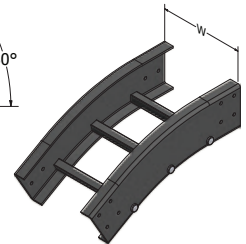
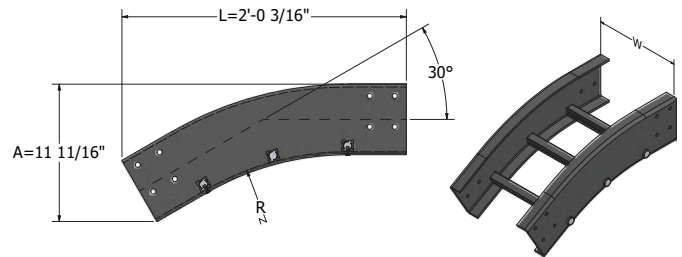
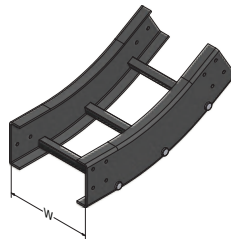
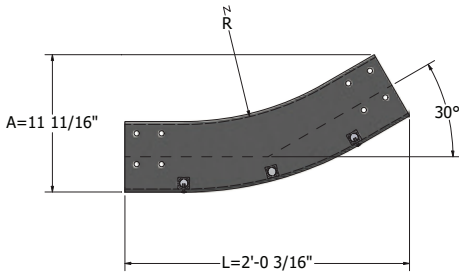
30° Vertical Bend

Part No. Key*

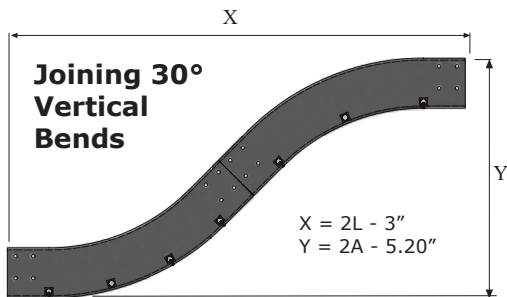
INSIDE: EIV-(Δ)6-30-(W)-24

Part No. Key*

OUTSIDE: EOV-(Δ)6-30-(W)-24



Available in 6" and 24" radius depth channel.



Joining 30° Vertical Bends

$$X = 2L - 3"$$

$$Y = 2A - 5.20"$$

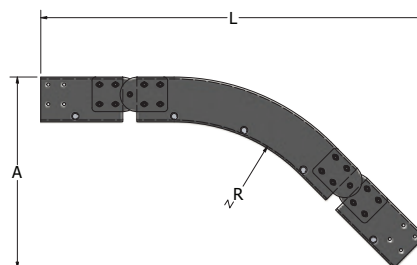
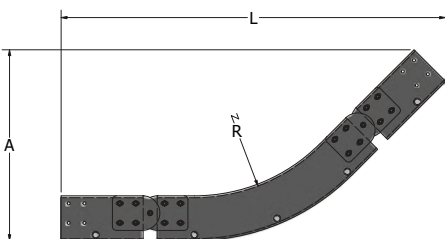
Vertical Adjustable Bend

Part No. Key*

INSIDE: EIVA-(Δ)(H)-45-(W)-(R)

Part No. Key*

OUTSIDE: EOVA-(Δ)(H)-45-(W)-(R)



Dimensions Inches (mm)

Radius	A	L
12 (305)	22 (559)	42 3/4 (1086)
24 (610)	25 1/2 (648)	51 1/4 (1302)
36 (914)	29 (737)	59 3/4 (1518)

Above values are for 6" tray only.

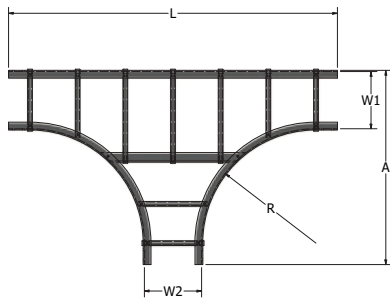
NOTE: mm values are nominal; * In Part No. Key, any parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall

Molded Fittings - Ladder Cable Tray

Horizontal Tee

Part No. Key*

EHT-(Δ)(H)-(W1)-(W2)-(R)



Contact us for dimensions on reducing tee.

Dimension Inches (mm)

Width	12" (305) Radius		24" (610) Radius**		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	22¾ (578)	39 (991)	34¾ (883)	63 (1600)	46¾ (1187)	87 (2210)
9 (229)	25¾ (654)	42 (1067)	37¾ (959)	66 (1676)	49¾ (1264)	90 (2286)
12 (305)	28¾ (730)	45 (1143)	40¾ (1035)	69 (1753)	52¾ (1340)	93 (2362)
18 (457)	34¾ (883)	51 (1295)	46¾ (1187)	75 (1905)	58¾ (1492)	99 (2515)
24 (610)	40¾ (1035)	57 (1448)	52¾ (1340)	81 (2057)	64¾ (1645)	105 (2667)
30 (762)	46¾ (1187)	63 (1600)	58¾ (1492)	87 (2210)	70¾ (1797)	111 (2819)
36 (914)	52¾ (1340)	69 (1753)	64¾ (1645)	93 (2362)	76¾ (1949)	117 (2972)

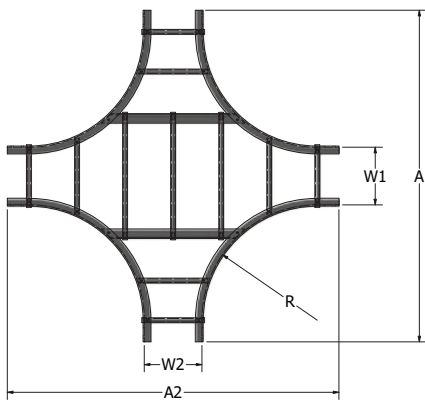
Horizontal Cross

Part No. Key*

EHC-(Δ)(H)-(W1)-(W2)-(R)

Contact us for dimensions on reducing cross.

Due to overall size of the 24" wide thru 36" wide, 36" radius cross assemblies are unable to be shipped via regular motor freight lines.



Dimension Inches (mm)

Width	12" Radius	24" Radius	36" Radius
	A	A**	A
6 (152)	39 (991)	63 (1600)	87 (2210)
9 (229)	42 (1067)	66 (1676)	90 (2286)
12 (305)	45 (1143)	69 (1753)	93 (2362)
18 (457)	51 (1295)	75 (1905)	99 (2515)
24 (610)	57 (1448)	81 (2057)	105 (2667)
30 (762)	63 (1600)	87 (2210)	111 (2819)
36 (914)	69 (1753)	93 (2362)	117 (2972)

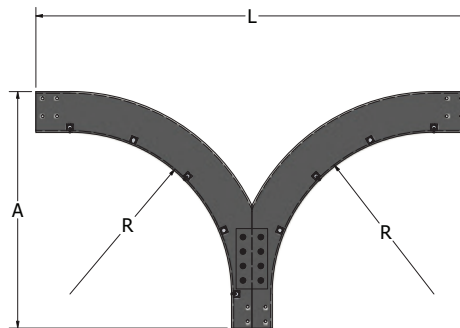
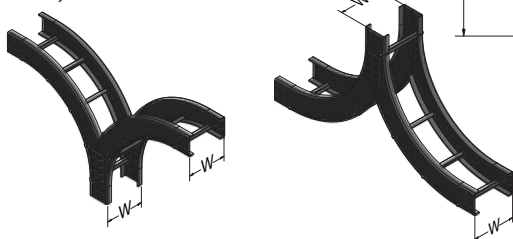
90° Vertical Tee

Part No. Key*

Up: EVT-(Δ)(H)-90-(W)-(R)-Up

Down: EVT-(Δ)(H)-90-(W)-(R)-Down

Tap up and tap down have the same dimensions. Please specify tap direction (up or down).



Dimensions Inches (mm)

Radius	A	L
	12 (305)	22¾ (578)
24 (610)	34¾** (883)	63½ (1613)
36 (914)	46¾ (1187)	87½ (2223)

NOTE: mm values are nominal; * In Part No. Key, any parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall; ** Also available in 4", 6" and 8" side rail

Ladder Cable Tray - Mitered Fittings

Pre-assembled mitered fittings are available for all tray types. Fittings are assembled using 316 SS fasteners unless specified otherwise. When connecting to molded fittings or straight sections, expansion splice plates are recommended. For conductive and halogen-free low smoke plus cable tray, splice plates must be stainless steel. Rung connections are made with a mechanical and/or chemical lock (see specification, pg. 12, item 5.2.4). For assistance with other sizes and widths including 10" mitered fittings, please contact us.

Listings & Approvals

UL: All the following mitered fittings are UL listed in 4", 6", and 8" in Polyester/Vinyl Ester.

Imperial Mitered Fittings Part Numbers

TYPE - (Δ)(H) - (A) - (W) - (R)
Example: EHB - HL6 - 90 - 24 - 24

Type of Fitting	Tray Type/Resin (Δ)	Side Rail Height (H)	Angle	Width (W)	Radius (R)
EHB = Horizontal Bend	See Selection Table to the Right	3 = 3"	30 = 30°	06 = 6"	12 = 12"
EIV = Vertical Inside		4 = 4"	45 = 45°	09 = 9"	24 = 24"
EOV = Vertical Outside		6 = 6"	60 = 60°	12 = 12"	36 = 36"
EHT = Horizontal Tee		8 = 8"	90 = 90°	18 = 18"	
EHC = Horizontal Cross		10 = 10"		24 = 24"	
EVT = Vertical Tee				30 = 30"	
ER = Right Reducer				36 = 36"	
EL = Left Reducer					
ESR = Straight Reducer					
EHBD = Horiz. Direct Bend					

Tray Type/Resin Selection Table

Resin	Tray Type (see page 8)			
	ELL3 ELL6	ETL4	EHL4 EHL6 D-EHL6	EHZ6
Polyester	LL	TL	HL	MZ
Vinyl Ester	LV	TV	HV	HVZ
Poly Halogen-Free	LS	TS	HS	HSZ
VE Halogen-Free	LVS	TVS	HVS	HVSZ
Halogen-Free Low Smoke Plus	LY	TY	HY	HYZ
Conductive	LRT	TRT	HRT	HRTZ

Look at left column to select resin, then look at top row to select tray type. Then, insert corresponding letters into fitting part no.

For vertical tee specify "up" or "down" at end of part code. Covers = EC before catalog number; example EC-EHB-MC6-90-24-24. Fasteners for covers are separate order item, see page 43.

Strut Rung = SR after part number; example EHB-MC6-90-24-24-SR. Marine Rung = MR after part number; example EHB-MC6-90-24-24-MR

Metric Mitered Fittings Part Numbers

TYPE - (Δ)(H) - (A) - (W) - (R)
Example: EHB - HL6 - 90 - 600 - 600

Type of Fitting	Tray Type/Resin (Δ)	Side Rail Height* (H)	Angle	Width (W)	Radius (R)
EHB = Horizontal Bend	See Selection Table to the Upper Right	3 = 75mm	30 = 30°	150 = 150mm	300 = 300mm
EIV = Vertical Inside		4 = 100mm	45 = 45°	225 = 225mm	600 = 600mm
EOV = Vertical Outside		6 = 150mm	60 = 60°	300 = 300mm	900 = 900mm
EHT = Horizontal Tee		8 = 200mm	90 = 90°	450 = 450mm	
EHC = Horizontal Cross		10 = 250mm		600 = 600mm	
EVT = Vertical Tee				750 = 750mm	
ER = Right Reducer				900 = 900mm	
EL = Left Reducer					
ESR = Straight Reducer					
EHBD = Horiz. Direct Bend					

* (mm) value is nominal. For vertical tee specify "up" or "down" at end of part code. Covers = EC before part number; example EC-EHB-MC6-90-600-600.

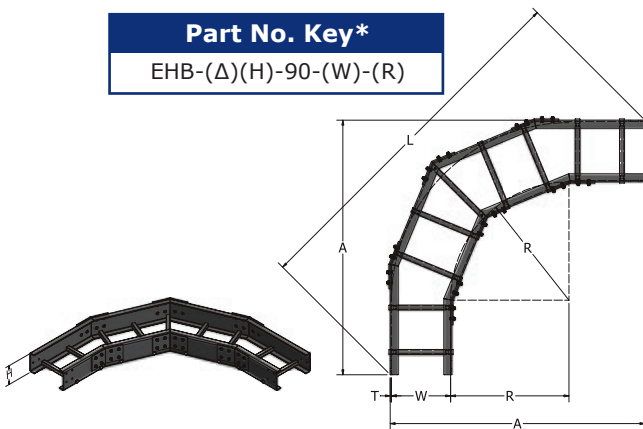
Fasteners for covers are separate order item, see page 43.

Strut Rung = SR after part number; example EHB-MC6-90-600-600-SR. Marine Rung = MR after part number; example EHB-MC6-90-600-600-MR

90° Horizontal Bend

Part No. Key*

EHB-(Δ)(H)-90-(W)-(R)

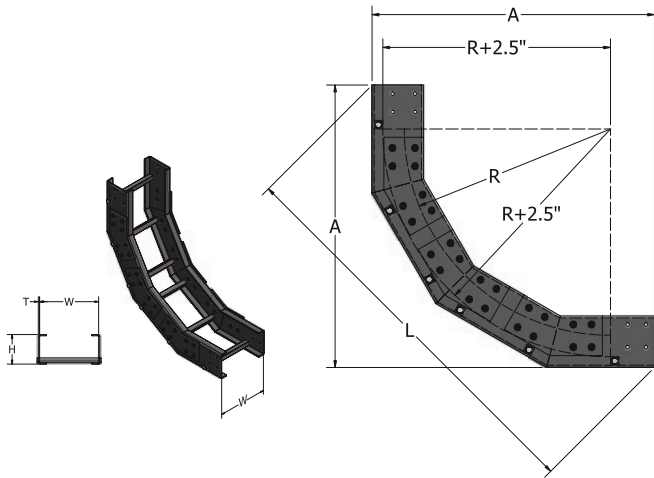


Width	Dimension Inches (mm)					
	12" (305) Radius		24" (610) Radius		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	33½ (854)	47½ (1207)	45½ (1159)	64½ (1638)	57½ (1464)	81½ (2070)
9 (229)	36½ (930)	51¼ (1314)	48½ (1235)	68¾ (1746)	60½ (1540)	85¼ (2178)
12 (305)	39½ (1006)	56 (1422)	51½ (1311)	73 (1854)	63½ (1616)	90 (2286)
18 (457)	45½ (1159)	64½ (1638)	57½ (1464)	81½ (2070)	69½ (1768)	98½ (2502)
24 (610)	51½ (1311)	73 (1854)	63½ (1616)	90 (2286)	75½ (1921)	107 (2718)
30 (762)	57½ (1464)	81½ (2070)	69½ (1768)	98½ (2502)	81½ (2073)	115½ (2931)
36 (914)	63½ (1616)	90 (2286)	75½ (1921)	107 (2718)	87½ (2226)	123½ (3146)

NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall.

Mitered Fittings - Ladder Cable Tray

Mitered Fittings

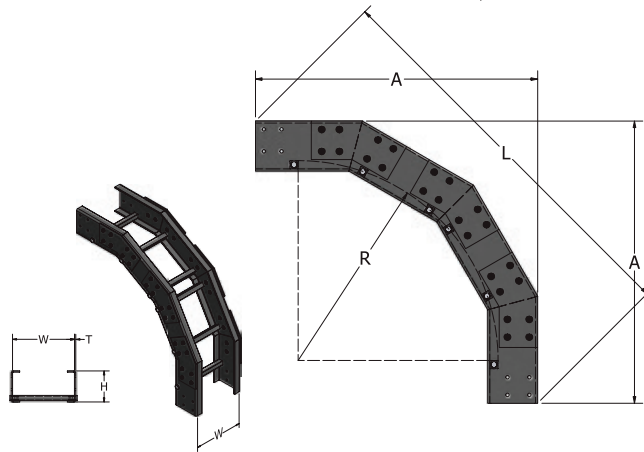


90° Vertical Inside Bend

Part No. Key*

EIV-(Δ)(H)-90-(W)-(R)

Dim. Inches (mm)	12" Radius			24" Radius			36" Radius		
	Depth**			Depth**			Depth**		
	4"	6"	8"	4"	6"	8"	4"	6"	8"
A	20 ⁷ / ₈ (530)	20 ⁷ / ₈ (530)	20 ⁷ / ₈ (530)	32 ⁷ / ₈ (835)	32 ⁷ / ₈ (835)	32 ⁷ / ₈ (835)	44 ⁵ / ₈ (1133)	44 ⁵ / ₈ (1133)	44 ⁵ / ₈ (1133)
L	29 ¹ / ₂ (749)	29 ¹ / ₂ (749)	29 ¹ / ₂ (749)	46 ¹ / ₂ (1181)	46 ¹ / ₂ (1181)	46 ¹ / ₂ (1181)	63 ³ / ₁₆ (1608)	63 ³ / ₁₆ (1608)	63 ³ / ₁₆ (1608)

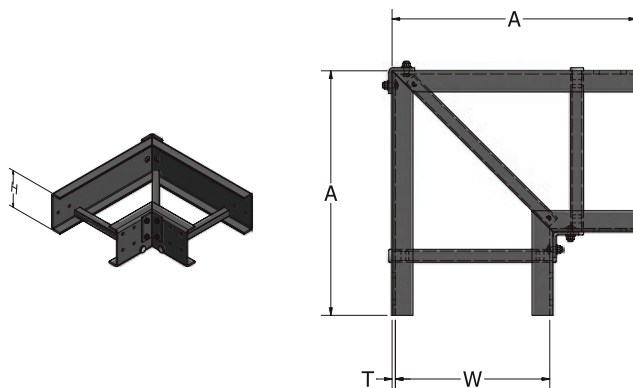


90° Vertical Outside Bend

Part No. Key*

EOV-(Δ)(H)-90-(W)-(R)

Dim. Inches (mm)	12" Radius			24" Radius			36" Radius		
	Depth**			Depth**			Depth**		
	4"	6"	8"	4"	6"	8"	4"	6"	8"
A	19 ⁷ / ₈ (505)	21 ⁷ / ₈ (555)	23 ⁷ / ₈ (606)	31 ⁷ / ₈ (810)	33 ⁷ / ₈ (860)	35 ⁷ / ₈ (911)	43 ⁷ / ₈ (1114)	45 ⁷ / ₈ (1165)	47 ⁷ / ₈ (1216)
L	28 ¹ / ₈ (714)	30 ¹⁵ / ₁₆ (786)	33 ³ / ₄ (857)	45 ¹ / ₁₆ (1145)	47 ¹⁵ / ₁₆ (1218)	50 ³ / ₄ (1289)	62 ¹ / ₁₆ (1576)	64 ⁷ / ₈ (1648)	67 ³ / ₄ (1721)



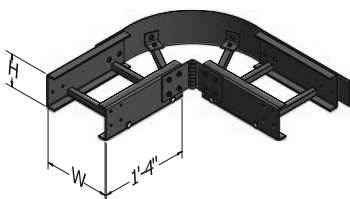
90° Horizontal Direct Bend

Part No. Key*

EHBD-(Δ)(H)-90-(W)

Dimensions Inches (mm)

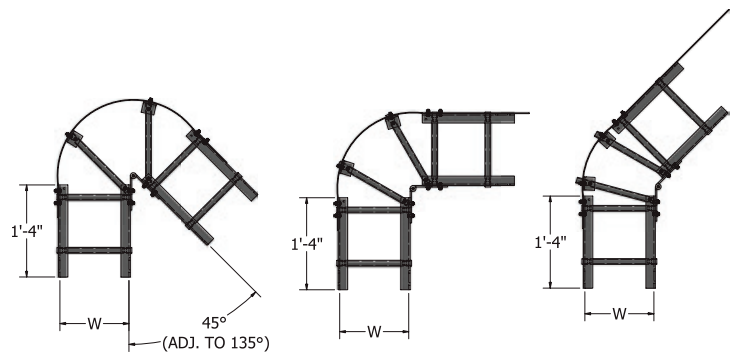
W	A
6 (152)	13 (330)
9 (229)	16 (406)
12 (305)	19 (483)
18 (457)	25 (635)
24 (610)	31 (787)
30 (762)	37 (940)
36 (914)	43 (1092)



Horizontal Adjustable Bend 45°-135°

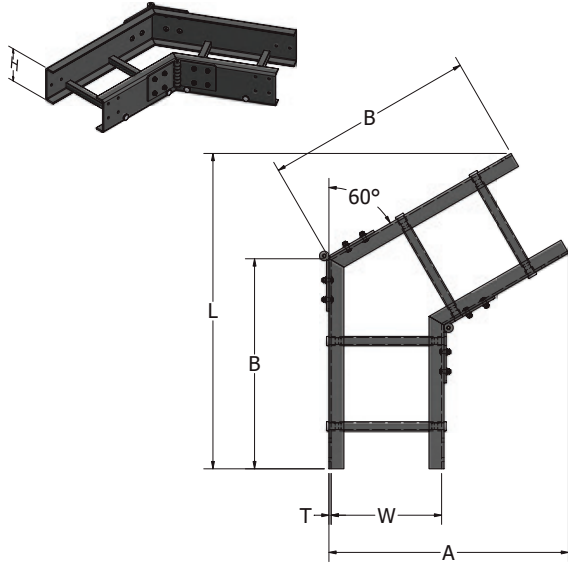
Part No. Key*

EHAB-(Δ)(H)-(W)



NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall; ** Contact us for availability of 3" (76mm)

Ladder Cable Tray - Mitered Fittings



30°, 45°, 60° Horizontal Direct Bend

Part No. Key*

EHBD-(Δ)(H)-30/45/60-(W)

The 60° fitting is fabricated with the horizontal adjustable splice plates.

Dimension Inches (mm)

Width	30° Angle (ø)		45° Angle (ø)		60° Angle (ø)	
	A	L	A	L	A	L
6 (152)	14 ⁷ / ₁₆ (370)	33 ³ / ₁₆ (846)	17 ³ / ₄ (451)	30 ³ / ₄ (806)	20 (508)	29 ¹ / ₁₆ (738)
9 (229)	17 ¹ / ₁₆ (446)	34 ¹³ / ₁₆ (884)	20 ³ / ₄ (527)	33 ¹³ / ₁₆ (859)	23 (584)	31 ¹¹ / ₁₆ (805)
12 (305)	20 ⁹ / ₁₆ (522)	34 ⁵ / ₁₆ (922)	23 ³ / ₄ (603)	35 ¹⁵ / ₁₆ (913)	26 (660)	34 ¹ / ₄ (870)
18 (457)	26 ⁶ / ₁₆ (675)	39 ⁵ / ₁₆ (999)	29 ³ / ₄ (756)	40 ³ / ₁₆ (1021)	32 (813)	39 ⁷ / ₁₆ (1002)
24 (610)	32 ² / ₁₆ (827)	42 ⁵ / ₁₆ (1075)	36 ³ / ₄ (933)	44 ⁷ / ₁₆ (1129)	38 (965)	44 ⁵ / ₈ (1133)
30 (762)	38 ¹⁶ / ₁₆ (979)	45 ⁵ / ₁₆ (1151)	41 ³ / ₄ (1060)	48 ¹¹ / ₁₆ (1237)	44 (1118)	49 ⁷ / ₈ (1267)
36 (914)	44 ⁹ / ₁₆ (1132)	48 ³ / ₁₆ (1227)	47 ³ / ₄ (1213)	52 ¹⁵ / ₁₆ (1345)	50 (1270)	55 ¹ / ₁₆ (1399)

45° Horizontal Bend

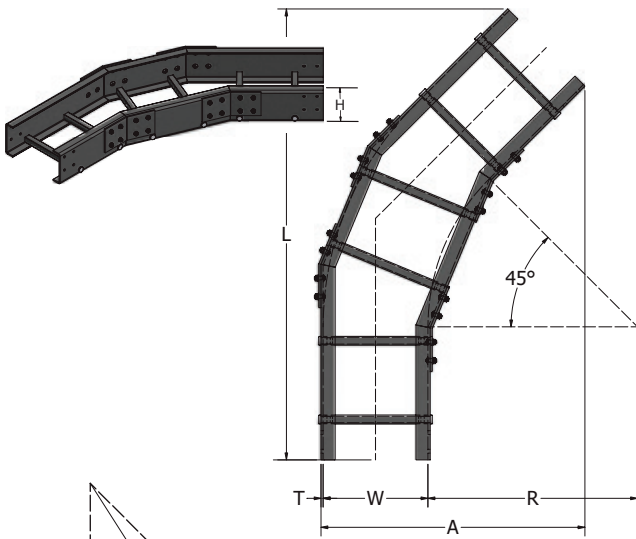
Part No. Key*

EHB-(Δ)(H)-45-(W)-(R)

Please contact us for other 30°/60° radius mitered fittings.

Joining 45° Horizontal Bend
 $X = 2A - .707 (W + .5)$
 $Y = 2L - .707 (W + .5)$

Dimension Inches (mm)



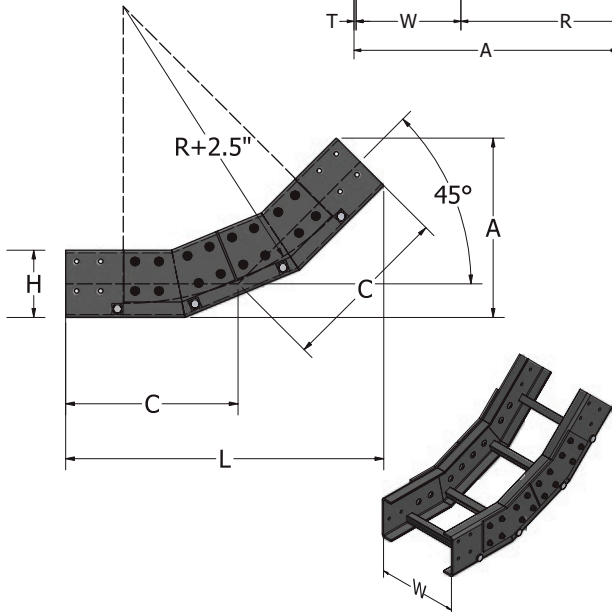
Width	12" (305) Radius		24" (610) Radius		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	20 ¹¹ / ₁₆ (525)	38 ⁷ / ₈ (987)	24 ¹ / ₄ (616)	47 ³ / ₈ (1203)	27 ³ / ₄ (705)	55 ⁷ / ₈ (1419)
9 (229)	23 ¹¹ / ₁₆ (602)	41 (1041)	27 ¹ / ₄ (692)	49 ¹ / ₂ (1257)	30 ³ / ₄ (781)	58 (1473)
12 (305)	26 ¹¹ / ₁₆ (678)	43 ³ / ₈ (1095)	30 ¹ / ₄ (768)	51 ¹ / ₈ (1311)	33 ³ / ₄ (857)	60 ¹ / ₈ (1527)
18 (457)	32 ¹¹ / ₁₆ (830)	47 ³ / ₈ (1203)	36 ¹ / ₄ (921)	55 ⁷ / ₈ (1419)	39 ³ / ₄ (1010)	64 ³ / ₈ (1635)
24 (610)	38 ¹¹ / ₁₆ (983)	51 ¹ / ₈ (1311)	42 ¹ / ₄ (1073)	60 ¹ / ₈ (1527)	45 ¹ / ₄ (1162)	68 ³ / ₈ (1743)
30 (762)	44 ¹¹ / ₁₆ (1135)	55 ⁷ / ₈ (1419)	48 ¹ / ₄ (1226)	64 ³ / ₈ (1635)	51 ³ / ₄ (1314)	72 ¹³ / ₁₆ (1846)
36 (914)	50 ¹¹ / ₁₆ (1287)	60 ¹ / ₈ (1527)	54 ¹ / ₄ (1378)	68 ³ / ₈ (1743)	57 ³ / ₄ (1467)	77 ¹ / ₁₆ (1957)

30°/45° Vertical Inside Bend

Part No. Key*

EIV-(Δ)(H)-30 or 45-(W)-(R)

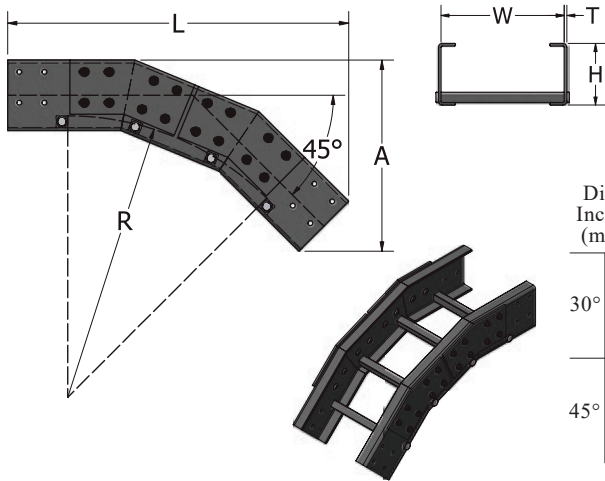
All dimensions are to the nearest 1/4"



Dim. Inches (mm)		12" Radius				24" Radius				36" Radius			
		Depth				Depth				Depth			
		3"	4"	6"	8"	3"	4"	6"	8"	3"	4"	6"	8"
30°	A	8 (203)	9 (229)	10 (254)	12 (305)	9 (229)	10 (254)	12 (305)	14 (356)	11 (279)	12 (305)	14 (356)	15 (381)
	L	18 (457)	18 (457)	18 (457)	18 (457)	24 (610)	24 (610)	24 (610)	24 (610)	30 (762)	30 (762)	30 (762)	30 (762)
45°	A	**	11 ¹ / ₁₆ (281)	12 ¹ / ₂ (318)	13 ³ / ₈ (352)	**	14 ¹ / ₁₆ (370)	16 (406)	17 ⁷ / ₁₆ (443)	**	18 ¹ / ₈ (470)	19 ¹ / ₂ (495)	20 ¹⁵ / ₁₆ (532)
	L	**	19 ⁷ / ₈ (505)	19 ⁷ / ₈ (505)	19 ⁷ / ₈ (505)	**	28 ³ / ₈ (721)	28 ³ / ₈ (721)	28 ³ / ₈ (721)	**	36 ³ / ₈ (937)	36 ³ / ₈ (937)	36 ³ / ₈ (937)

NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall; ** Contact us for availability of 3" (76mm)

Mitered Fittings - Ladder Cable Tray

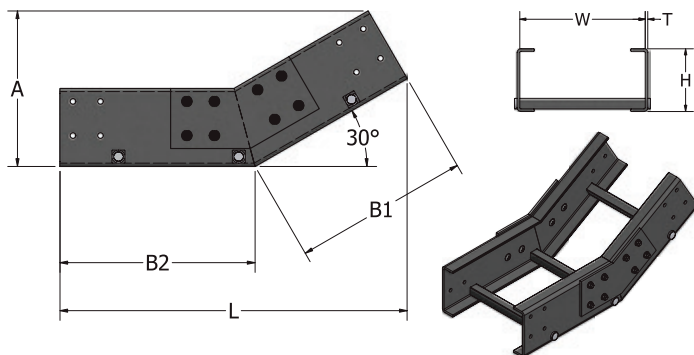


30°/45° Vertical Outside Bend

Part No. K* EOVD-(Δ)(H)-30 or 45-(W)-(R)

All dimensions are to the nearest 1/4"

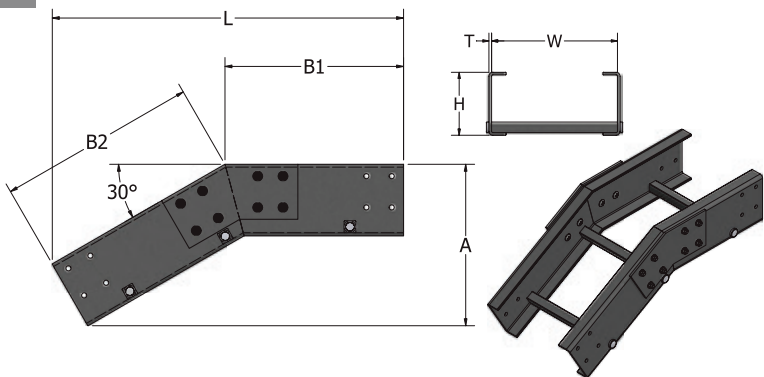
Dim. Inches (mm)	12" Radius				24" Radius				36" Radius				
	Depth				Depth				Depth				
	3"	4"	6"	8"	3"	4"	6"	8"	3"	4"	6"	8"	
30°	A	7 (178)	8 (203)	10 (254)	10 (254)	9 (229)	10 (254)	12 (305)	12 (305)	11 (279)	12 (305)	14 (356)	14 (356)
	L	17 (432)	17 (432)	18 (457)	18 (457)	23 (584)	23 (584)	24 (610)	24 (610)	29 (737)	29 (737)	30 (762)	30 (762)
45°	A	**	10 3/4 (273)	12 3/4 (324)	14 3/4 (375)	**	14 5/16 (364)	16 5/16 (414)	18 5/16 (465)	**	17 13/16 (452)	19 13/16 (503)	21 13/16 (554)
	L	**	19 3/16 (487)	20 1/16 (522)	22 (559)	**	27 1/16 (703)	29 1/16 (738)	30 1/2 (775)	**	36 1/8 (918)	37 7/16 (954)	39 (991)



30°/45° Vertical Inside Direct Bend

Part No. K* EIVD-(Δ)(H)-30 or 45-(W)

Dim. Inches (mm)	30° Angle (ø)			45° Angle (ø)		
	Depth**			Depth**		
	4"	6"	8"	4"	6"	8"
A	10 3/16 (259)	11 13/16 (303)	13 11/16 (348)	12 3/8 (314)	13 13/16 (351)	15 3/16 (386)
L	26 11/16 (678)	26 11/16 (678)	26 11/16 (678)	24 3/16 (624)	24 1/16 (624)	24 3/16 (624)



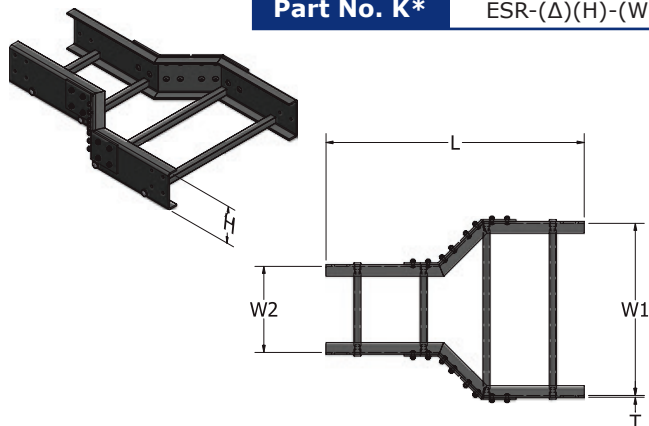
30°/45° Vertical Outside Direct Bend

Part No. K* EOVD-(Δ)(H)-30 or 45-(W)

Dim. Inches (mm)	30° Angle (ø)			45° Angle (ø)		
	Depth**			Depth**		
	4"	6"	8"	4"	6"	8"
A	11 13/16 (300)	13 3/16 (344)	16 1/16 (408)	14 11/16 (357)	16 1/16 (408)	18 5/8 (473)
L	29 1/2 (749)	29 1/2 (749)	30 7/8 (784)	26 7/8 (683)	26 7/8 (683)	27 15/16 (710)

Straight Reducer

Part No. K* ESR-(Δ)(H)-(W1)x(W2)



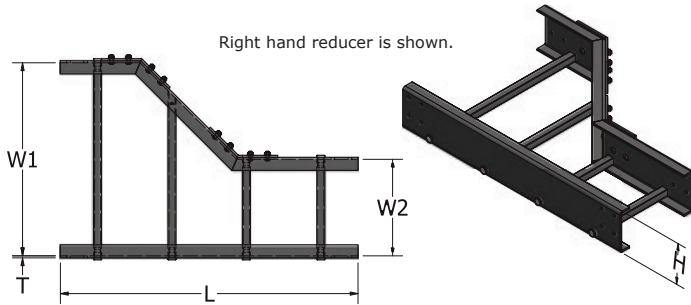
W2 Inches (mm)	W1 Inches (mm)					
	36 (914)	30 (762)	24 (610)	18 (457)	12 (305)	9 (229)
6 (152)	43 1/2 (1105)	40 1/2 (1029)	37 1/2 (953)	34 1/2 (876)	27 3/4 (705)	26 3/8 (670)
9 (229)	42 (1067)	39 (991)	36 (914)	33 (838)	26 3/8 (670)	—
12 (305)	40 1/2 (1029)	37 1/2 (953)	36 (914)	26 3/4 (679)	—	—
18 (457)	37 1/2 (953)	36 (914)	26 3/4 (679)	—	—	—
24 (610)	36 (914)	26 3/4 (679)	—	—	—	—
30 (762)	26 3/4 (679)	—	—	—	—	—
Dimension "L" Inches (mm)						

NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall; ** Contact us for availability of 3" (76mm)

Ladder Cable Tray - Mitered Fittings

Right or Left Hand Reducer

Part No. K*	RIGHT: ER-(Δ)(H)-(W1)x(W2)
Part No. K*	LEFT: EL-(Δ)(H)-(W1)x(W2)

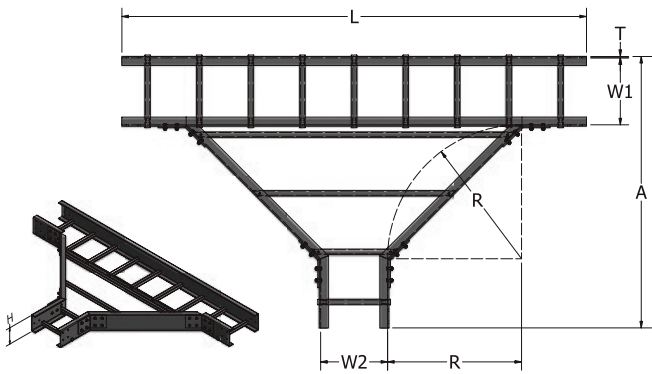


W2 Inches (mm)	W1 Inches (mm)					
	36 (914)	30 (762)	24 (610)	18 (457)	12 (305)	9 (229)
6 (152)	55½ (1410)	46¼ (1175)	46¼ (1175)	37 (940)	37 (940)	27¾ (705)
9 (229)	46¼ (1175)	46¼ (1175)	37 (940)	37 (940)	27¾ (705)	—
12 (305)	46¼ (1175)	37 (940)	37 (940)	27¾ (705)	—	—
18 (457)	37 (940)	37 (940)	27¾ (705)	—	—	—
24 (610)	37 (940)	27¾ (705)	—	—	—	—
30 (762)	27¾ (705)	—	—	—	—	—

Dimension "L" Inches (mm)

Horizontal Tee

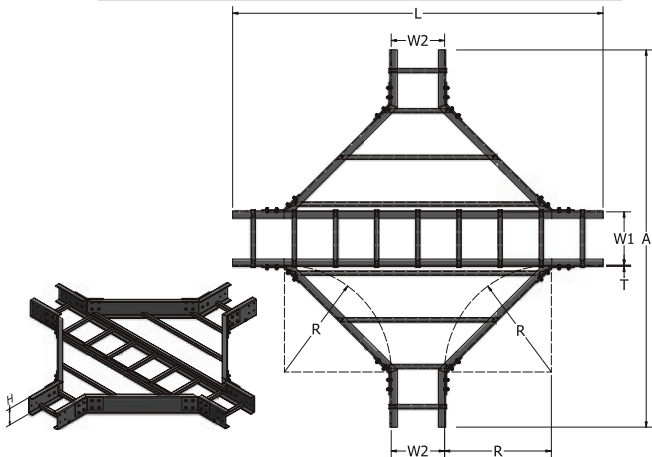
Part No. K*	EHT-(Δ)(H)-(W1)-(W2)-(R)
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Width	Dimension Inches (mm)					
	12" (305) Radius		24" (610) Radius		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	30¾ (780)	55½ (1410)	42¾ (1080)	74 (1880)	54¾ (1390)	101¾ (2580)
9 (229)	33¾ (850)	55½ (1410)	45¾ (1160)	83¼ (2110)	57¾ (1460)	101¾ (2580)
12 (305)	36¾ (930)	55½ (1410)	48¾ (1240)	83¼ (2110)	60¾ (1540)	111 (2820)
18 (457)	42¾ (1080)	64¾ (1640)	54¾ (1390)	92½ (2350)	66¾ (1690)	111 (2820)
24 (610)	48¾ (1240)	74 (1880)	60¾ (1540)	92½ (2350)	72¾ (1840)	120¼ (3050)
30 (762)	54¾ (1390)	74 (1880)	66¾ (1690)	101¾ (2580)	78¾ (2000)	129½ (3290)
36 (914)	60¾ (1540)	83¼ (2110)	72¾ (1840)	111 (2820)	84¾ (2150)	129½ (3290)

Horizontal Cross

Part No. K*	EHC-(Δ)(H)-(W1)-(W2)-(R)
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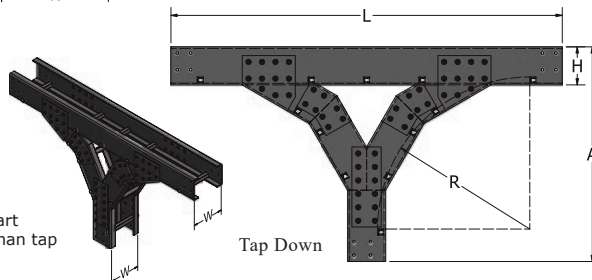
Width	Dimension Inches (mm)					
	12" (305) Radius		24" (610) Radius		36" (914) Radius	
	A	L	A	L	A	L
6 (152)	54¾ (1390)	55½ (1410)	78¾ (2000)	74 (1880)	102¾ (2610)	101¾ (2580)
9 (229)	57¾ (1470)	55½ (1410)	81¾ (2080)	83¼ (2110)	105¾ (2690)	101¾ (2580)
12 (305)	60¾ (1540)	55½ (1410)	84¾ (2150)	83¼ (2110)	108¾ (2760)	111 (2820)
18 (457)	66¾ (1700)	64¾ (1640)	90¾ (2310)	92½ (2350)	114¾ (2910)	111 (2820)
24 (610)	72¾ (1850)	74 (1880)	96¾ (2460)	92½ (2350)	120¾ (3070)	120¼ (3050)
30 (762)	78¾ (2000)	74 (1880)	102¾ (2610)	101¾ (2580)	126¾ (3220)	129½ (3290)
36 (914)	84¾ (2150)	83¼ (2110)	108¾ (2760)	111 (2820)	132¾ (3370)	129½ (3290)

Vertical Tee

Part No. K*

EVT-(Δ)(H)-90-(W)-(R)

Specify "up" or "down" at the end of the part number. For tap up, dimensions different than tap down, contact us for dimensions.



Radius	For 6" tray only	
	Dimensions Inches (mm)	
	A	L
24 (610)	33¾ (860)	61¾ (1568)
36 (914)	45¾ (1165)	85¾ (2178)

NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code; Δ = Resin; H = Side Rail Height; R = Radius; W = Width of the inside distance from tray wall to tray wall

Splice Plates - Ladder Cable Tray

Enduro offers a full line of fiberglass splice plates designed to provide a structural transition between straight sections and fittings. Enduro splice plates and hardware are sold separately and are not provided as standard with straight sections or fittings due to the many hardware options. All plates have 7/16" pre-drilled bolt holes.

NEMA FG-1

Please refer to NEMA FG-1 regarding proper tray installation as it pertains to support and splice plate locations for straight sections and fittings. Refer to page 11 for recommended support locations. **NEMA**

Ladder Cable Tray Splice Plate Part Numbers

TYPE - (H)(Δ) - (D)

Example: **ESP - 6C - 180**

Type

ESP = Straight
EEP = Expansion
EVS = Vertical
EHS = Horizontal

Side Rail Height

3 = 3" (75mm)*
4 = 4" (100mm)*
6 = 6" (150mm)*
8 = 8" (200mm)*
10 = 10" (250mm)*

Material

C = Polyester
V = Vinyl Ester
SS = Stainless Steel
S = Halogen-Free

Degree

180 = Straight, Expansion
90 = 90°
45 = 45°
30 = 30°
22.5 = 22.5°
HA = Horiz. Adjustable**
VA = Vert. Adjustable**

* (mm) value is nominal. ** For Horiz. and Vert. Adjustable part number use "ESP" for Type, example: ESP-6C-HA. Expansion plates have 1" slotted holes allowing 5/8" total contraction and expansion. Refer to thermal contraction table on page 6 for maximum spacing between expansion joints. Side rail height of 3" and 4" requires 4 bolt sets per plate. Side rail height of 6" and 8" requires 8 bolt sets per plate. Side rail height of 10" requires 12 bolt sets per plate. For 6" and 8" channel heavy duty splice plates, see page 24.

Splice Plate and Hardware Options

Tray Resin	Splice Plate Material				Hardware Material Sets			
	Polyester	Vinyl Ester	Halogen-Free Polyester	316 Stainless Steel	316 Stainless Steel	Monel	Silicon Bronze	Isoplast
Polyester	Standard	Optional		Optional	Standard	Optional	Optional	Optional
Vinyl Ester		Standard		Optional	Standard	Optional	Optional	Optional
Halogen-Free Polyester		Optional	Optional	Standard	Standard	Optional	Optional	Optional
Halogen-Free Vinyl Ester				Standard	Standard	Optional	Optional	Optional
Halogen-Free Low Smoke Plus				Standard	Standard	Optional	Optional	Optional
Conductive				Standard	Standard	Optional	Optional	Optional

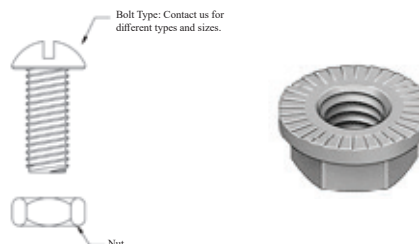
Hardware

Type	Set Includes	Size	For Use With Tray Types	Part No.
316 Stainless Steel Bolt Set	Bolt, nut	3/8"-16 x 1"	All tray types (except 10" Channel)	#505166SS*
316 Stainless Steel Bolt Set	Bolt, nut, washer	3/8"-16 x 1 1/2"	For use with VA splice plate	#505168SS
Monel Bolt Set	Bolt, nut	3/8"-16 x 1 1/4"	All tray types (except 10" Channel)	#606167M
FRP/GRP Studs & Nuts	Stud and 2 nuts	3/8"-16 x 2"	ELL3, EHZ6	#707166F
FRP/GRP Studs & Nuts	Stud and 2 nuts	3/8"-16 x 2 1/2"	EHL6, EHL8, EHV6	#707167F
Silicon Bronze Bolt Set	Bolt, nut	3/8"-16 x 1 1/4"	All tray types (except 10" Channel)	#808167SB

* Standard hardware set; NOTE: For monel and silicon bronze, please contact us for lead times. Also available in additional sizes. For 10" channel, please contact us for hardware; It is recommended that expansion splice plates and 1 1/2" long assembly fasteners be used when connecting mitered fittings to molded fittings or straight lengths.

Fastener Torque

Inch: GRD. 2 UNC		Metric: Class 5.8	
Size	Ft-Lbs	Size	N-m
1/4 - 20	4-6	M8 x 1.25	14-16
3/8 - 16	17-23	M10 x 1.5	26-33
1/2 - 13	42-56	M12 x 1.75	45-58



Ladder Cable Tray - Splice Plates

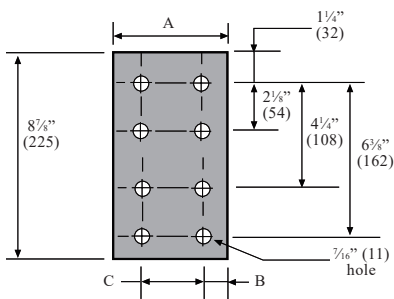
Typical Dimensions for FRP/GRP Splice Plates

Typical Dimensions Inches (mm)			
Channel Depth Inches (mm)	A	B	C
3 (76)	1 3/4 (44)	1 (25)	-0-
4 (102)	2 (51)	1 (25)	-0-
6 (152)	4 3/8 (117)	1 (25)	2 5/8 (67)
8 (203)	6 (152)	1 1/16 (43)	2 5/8 (67)

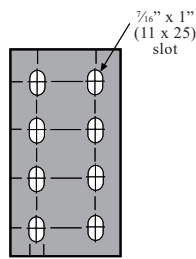
Typical Dimensions for Stainless Splice Plates

Typical Dimensions Inches (mm)			
Channel Depth Inches (mm)	A	B	C
3 (76)	1 1/4 (32)	5/8 (16)	-0-
4 (102)	1 1/4 (32)	5/8 (16)	-0-
6 (152)	4 1/8 (105)	3/4 (19)	2 5/8 (67)
8 (203)	4 1/8 (105)	3/4 (19)	2 5/8 (67)

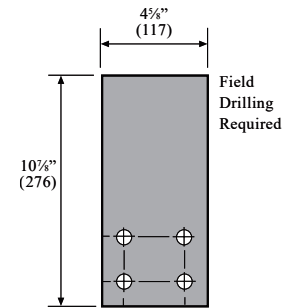
Straight Section



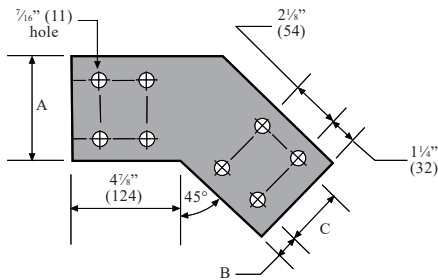
Expansion



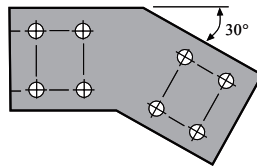
90° Vertical



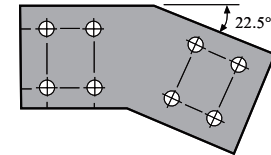
45° Vertical



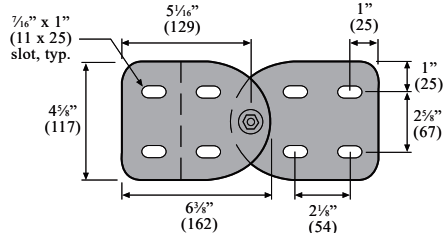
30° Vertical



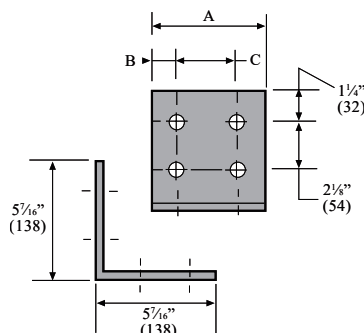
22.5° Vertical



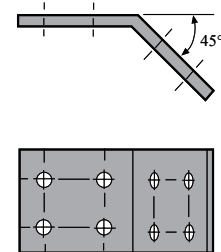
Adjustable Vertical



90° Horizontal



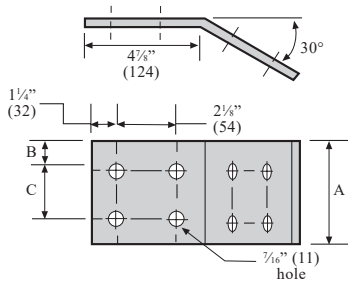
45° Horizontal



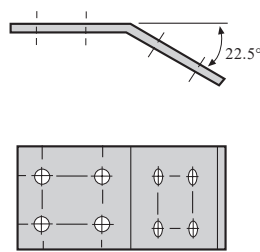
For adjustable vertical plate hardware, use catalog number 505168SS. For travel dimensions, contact us.

Splice Plates - Ladder Cable Tray

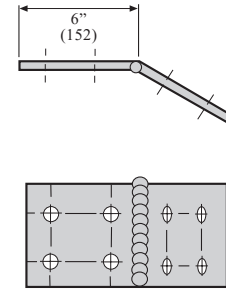
30° Horizontal



22.5° Horizontal



Adjustable Horizontal



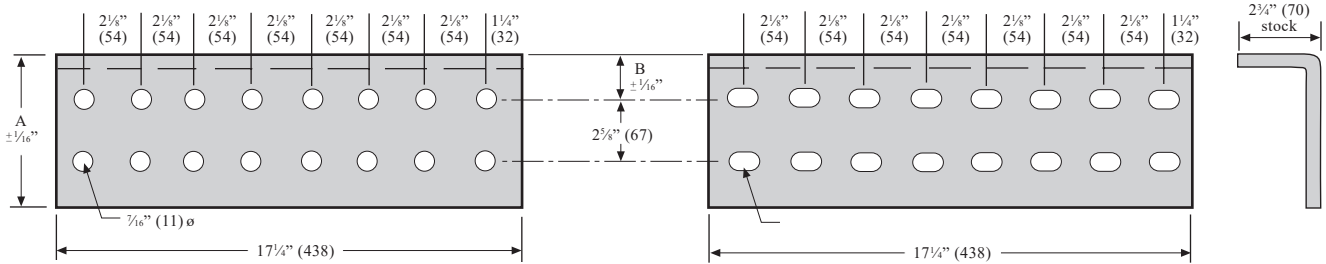
Heavy Duty Splice Plates

Part No. Key*

ESP-(H) HP-180 Splice Plate

Part No. Key*

EESP-(H) HP-180 Splice Plate



Side Rail Height Inches (mm)	A Inches (mm)	B Inches (mm)
4 (102)	3 (76)	1 3/8 (35)
6 (152)	5 (127)	1 3/8 (35)
8 (204)	6 3/8 (162)	2 1/16 (52)

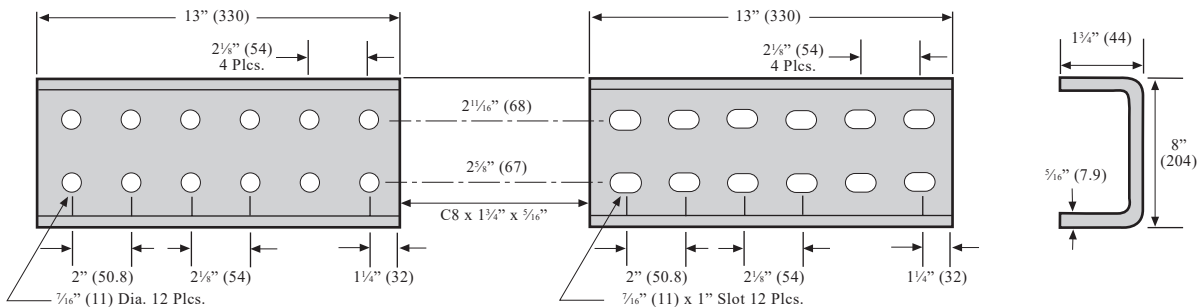
10" Channel Splice Plates

Part No.

ESP-10C-180 Splice Plate

Part No.

EESP-10C-180 Splice Plate



* In Part No. Key, parentheses () = insert corresponding option code; H = Side Rail Height - 4, 6, 8 (inches)

Ladder Cable Tray - Accessories

Enduro offers a full line of accessories for our electrical products including cable tray covers, divider strips, drop outs, blind ends, adapters, hold-down clips, marine rungs, strut rungs, swivel clamps and a wide variety of stainless steel or FRP/GRP cable tray fasteners appropriate for any application.

Resin Designation Δ = Insert one of the following letters for resin designations when required.

P = Polyester (Example: EPC-CL-12-P)
V = Vinyl Ester (Example: EPC-CL-12-V)

Y = Halogen-Free Low Smoke Plus (Example: EPC-CL-12-Y)

RT = Conductive (Example: EPC-CL-12-RT)

S = Poly Halogen-Free (Example: EPC-CL-12-S)

VS = VE Halogen-Free (Example: EPC-CL-12-VS)

Cable tray covers are recommended for those areas where the cable needs protection from falling objects, adverse weather conditions, etc. Available in 10ft. (3m) sections in both flat and peaked design. In addition to cover, solid bottom is also available. See page 26 for cover accessories.

FLAT COVER

E Δ (C)-(W)

1 Clamless*

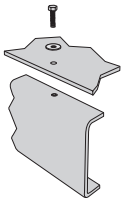
E Δ (C)-CL-(W)

Installation Methods for Flat Cover: Thermoplastic Drive Rivets (part no. R-25) are the most economical method, but do require field drilling. It is recommended rivets be installed on 24" centers along both side rails. Cover Hold Down Clamps and Enduro Stand Offs allow cover to be removed for easy access to cables - see page 26. It is recommended to use standoffs every 18". Add ventilation height 2" for Flat Cover. Flat covers can be ventilated or non-ventilated. Diagram shown is ventilated. **To order Flat Cover for ladder cable tray fittings, add "EC" before fitting part number.**
Example: EC-EHB-MC6-90-24-24

Easiest & Lowest Installation Cost

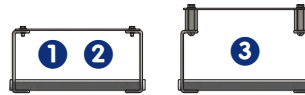
Eliminates the need for Cover Hold Down Clamp for a quicker and easier field installation. Recommended to be purchased with a cable tray straight section matching the clamless flat cover section.

Stainless embedded nut pre-installed by Enduro



A total of three pairs of stainless embedded nuts are pre-installed to the cable tray channels by Enduro. Contact us for metal types available on embedded nuts. 1/4" diameter stainless fasteners and flat washers are also included and shipped separately.

Contact us regarding fittings availability on this type of cover system. Available tray widths (inches): 6, 9, 12, 18, 24, 30, 36

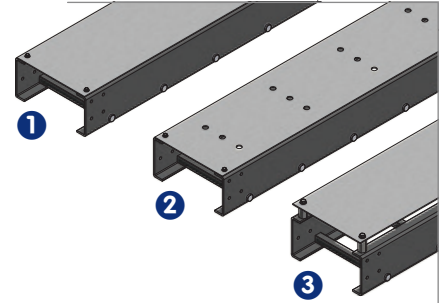


2 Clamless Perforated*

E Δ (C)-(W)-Perforated

3 Ventilated

E Δ (C)-(W) & Stand-off hardware



Tray Width in (mm)	"C" Tray Type	
	Part#	wt/LF
6 (152)	EPC-06	0.57
9 (229)	EPC-09	0.86
12 (305)	EPC-12	1.14
18 (457)	EPC-18	1.71
24 (610)	EPC-24	2.28
30 (762)	EPC-30	2.85
36 (914)	EPC-36	3.42

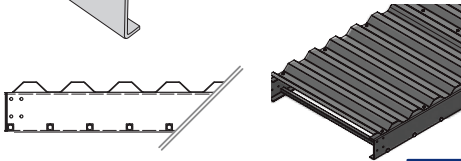
For "Z" tray, contact factory.

RIGID SEMI-FLAT COVER

EPC-(W)-7.2X1.5-(Δ)FR LTGRX10'

Clamless*

EPC-CL-(W)-7.2X1.5-(Δ)FR LTGRX10'



PULTRUDED PEAKED COVER

E Δ (C)22-(W)-10

Ventilated*

E Δ (C)22-(W)-10 & Stand-Offs

Contact us for Z-Tray covers.

Installation Methods for Peaked Cover: Use three pair of Enduro Stand Offs - Peaked for each 10 ft. length of tray.

Peaked cover is not available for fittings.

Contact us for information on 22.5°, 30° and 45° peaked covers.

Add ventilation height 1 3/4" for peaked cover. Peaked covers can be ventilated or non-ventilated. Diagram shown is ventilated.



RIGID PEAKED COVER

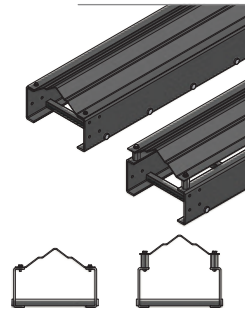
E Δ (C)22-(W)-10-P

Clamless*

E Δ (C)22-CL-(W)-10-P

Ventilated*

E Δ (C)22-(W)-10-P & Stand-Offs



"C" Tray Width	in (mm)		
	W	H	Wt/LF
EPC22-06	6 (152)	.06 (15)	0.77
EPC22-09	9 (229)	.09 (23)	0.77
EPC22-12	12 (305)	1.2 (31)	1.3
EPC22-18	18 (457)	1.8 (46)	1.5
EPC22-24	24 (610)	2.4 (61)	1.9
EPC22-30	30 (762)	3.0 (76)	2.1
EPC22-36	36 (914)	3.6 (91)	2.4

SOLID BOTTOM COVER

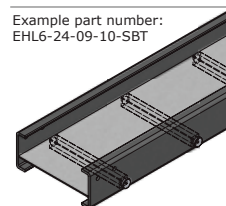
Above Rung*

(TS)-(W)-(RS)-(L)-SBT

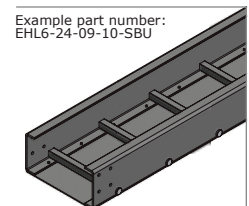
Clamless Beneath*

(TS)-(W)-(RS)-(L)-SBU

Example part number:
EHL6-24-09-10-SBT



Example part number:
EHL6-24-09-10-SBU



* In Part No. Key, parentheses () = insert corresponding option code; Δ = Insert resin designation, see gray box at top; W = Width of the inside distance from tray wall to tray wall; TS = Tray System; RS = Rung Space; L = Length

Accessories - Ladder Cable Tray

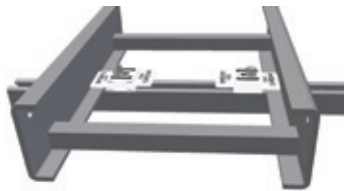
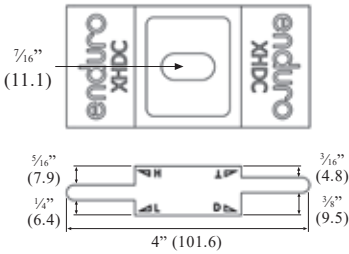
Hold Down Clamp & Expansion Guide

Enduro's XHDC serves as both a Hold Down Clip and Expansion Guide for all Enduro ladder tray types. This new design eliminates the need for ordering or tracking multiple products for securing ladder tray to structural supports.

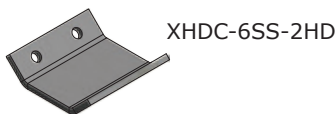
Installation: To determine the appropriate orientation for installation, rotate the XHDC to the corresponding letter indicator (etched into side profile) as shown in the table below. Each row shows which letter indicator to use for each series, for use as either Hold Down Clip, or Expansion Guide. See example below.

Part No. XHDC		Tray Type
Hold Down Clamp	Expansion Guide	
T	L	ELL3
L	H	EHL4
L	H	EHL6
H	D	D-EHL6
H	D	EHZ6
H	D	EHL8
D	contact us	D-EHL10

For installation hardware selection, please contact us and specify installation conditions.



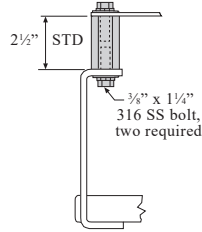
Stainless Steel



XHDC-SS applied to interior of channel, XHDC-SS-HD & XHDC-SS-2HD applied to exterior of channel

Stand Off

Part No.
ESO



Vinyl Ester resin is the standard.

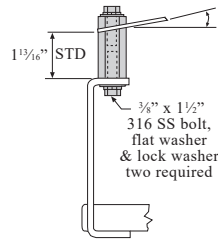
Includes mounting hardware.

Not suited for high wind applications.

Not available for EHZ6 tray.

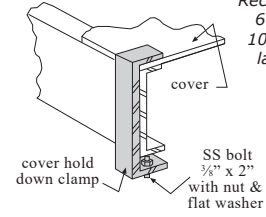
Stand Off Peaked

Part No.
ESOP



Cover Hold Down Clamp

Part No. Key*
ECHD-(H)(Δ)



Not suited for high wind applications. Not available for EHZ6 tray. Recommended: 6 per every 10' section of ladder tray

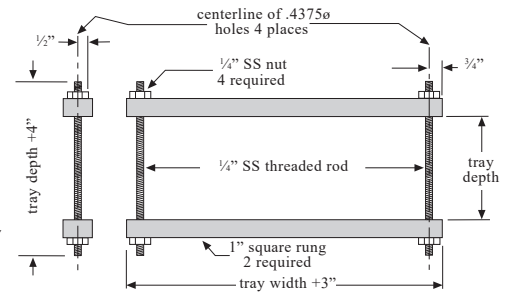
Complete Cover Hold Down

Part No. Key*
CCHD-(H)(Δ) x (W)

Recommended Usage: To secure cover to tray in an outdoor application.

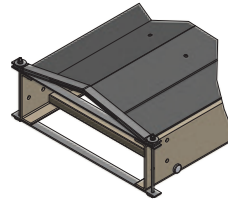
Best suited for a high wind applications. Available in stainless steel, contact us for dimensions.

Recommended: 3 per every 10' section of ladder tray



Pultruded Peaked Cover Hold Down

Part No. Key*
CPCHD-(H)(Δ) x (W)



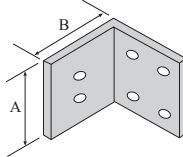
Rigid Peaked Cover Hold Down

Part No. Key*
CPHD-(H)(Δ)x(W)

Top piece only available in 316SS, bottom piece available in FRP rung or SS plate

Floor / Panel Flange Plate

Part No. Key*	Side Rail Ht	Dim. A	Dim. B
FP-3(Δ)	3" (76)	1 3/4"	5 1/16"
FP-4(Δ)	4" (102)	2 1/4"	5 7/16"
FP-6(Δ)	6" (152)	4 3/8"	5 7/16"
FP-8(Δ)	8" (203)	6"	5 7/16"
FP-10(Δ)	10" (254)	8"	5 7/16"



Please contact us for stainless steel dimensions. See bottom of page for (Δ) code. All drilled holes are 7/16" in diameter. Hole pattern varies with tray type.

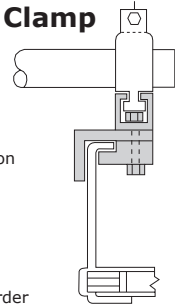
Conduit Swivel Clamp

Part No. Key*
ECTC-(TD)

This allows an easy transition to/from conduit and FRP/GRP cable tray.

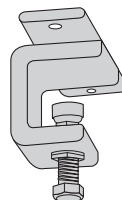
Please substitute cable tray designation when ordering (Example TD = EHL6).

Pipe clamps are separate order item, see page 40. For Vinyl Ester add "VE" to end of part number Example: ECTC-(TD)-VE.



Beam Hold Down Guide

Part No.
611868



Eliminates the Need to Drill or Punch Holes While Allowing for Normal Expansion

A stainless steel guide that secures the position of cable tray on a support rack or structure.

Guide becomes a clamp with use of a 316 SS set screw on top. Set screw is included with part.

Guide is also easily adaptable for right or left sided installations.

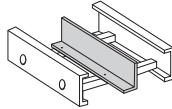
Ladder Cable Tray - Accessories

Divider Strip

Part No. Key*	
Loose Divider	Installed Divider
EDS-(Δ)3x10	EDS-(Δ)3x10 Installed
EDS-(Δ)4x10	EDS-(Δ)4x10 Installed
EDS-(Δ)6x10	EDS-(Δ)6x10 Installed
EDS-(Δ)8x10	EDS-(Δ)8x10 Installed
EDS-(Δ)3x3M	EDS-(Δ)3x3M Installed
EDS-(Δ)4x3M	EDS-(Δ)4x3M Installed
EDS-(Δ)6x3M	EDS-(Δ)6x3M Installed
EDS-(Δ)8x3M	EDS-(Δ)8x3M Installed

Divider strips are supplied in ten foot lengths. Unless indicated otherwise, dividers are intended for field installation. Please indicate installation position if required. For easier installation, dividers can be furnished with factory-drilled notching with additional cost.

Divider strips are available for fittings, please contact us for part numbers. For securing riveted divider to tray we use 3/16" SS rivets. We also have available thermoplastic drive rivets (directly below) which require field drilling.



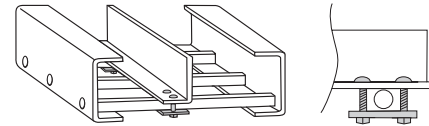
Adjustable Clamp for Divider Strip

Part No. Key*
For □ Side Rail: ADC-1(Δ)
For ⊔ Side Rail: ADC-2(Δ)

Minimum requirement: secure down every other rung

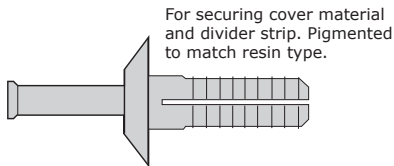
This part number is only for the adjustable clamp, does not include divider strip.

[side rail only available in 3" (76), 4" (102), 6" (152) and 8" (203)



Drive Rivet

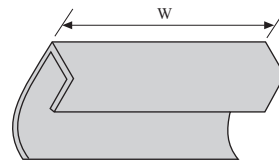
Part No. Key*
Nylon Thermoplastic: R-25-(Δ)
Stainless Steel: RIVET SS-POP #610 316SS



For securing cover material and divider strip. Pigmented to match resin type.

Drop Out

Part No. Key*
For □ Side Rail: EDO-1-(W)
For ⊔ Side Rail: EDO-2-(W)
For 10" □ Side Rail: EDO-3-(W)



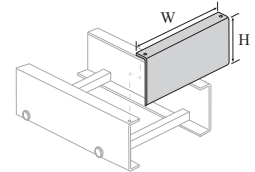
Actual width of Drop Out is less than width of tray to allow for placement inside channel flange. R-25 drive rivets (left) are a separate order item. For Vinyl Ester, add "VE" to the end of part number. For Halogen-Free Low Smoke Plus resin add "Y" to part number.

Drop Out installation for less than 12" width: Drill two 1/4" holes 1" from each end. Insert R-25 rivet into each opening. Drop Out installation for more than 12" width: Drill three 1/4" holes 1" from each end and in the middle. Insert R-25 rivet into each opening.

Blind End

Part No. Key*
EBE-(H)(Δ)-(W)

316 SS fasteners included.



Standard Field Install Rung

Part No. Key*
EFIR-(W)-(PE or VE)

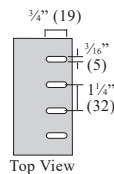
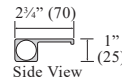
Rung is standard 1" x 1" rung. PE = Polyester; VE = Vinyl Ester; Example for a 6" wide rung, polyester resin: EFIR-06-PE Hardware included.



Marine Field Install Rung

Part No. Key*
EFIR-MR-(W)-(PE or VE)

PE = Polyester; VE = Vinyl Ester; Example for a 6" wide rung, polyester resin: EFIR-MR-06-PE Hardware included.



Strut Field Install Rung

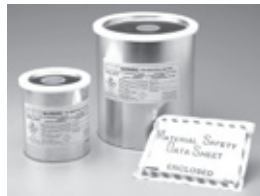
Part No. Key*
EFSR-(W)-(PE or VE)

PE = Polyester; VE = Vinyl Ester; Example for a 6" wide rung, polyester resin: EFSR-06-PE



Field Cutting Sealant

Part No.
Quart Can: ESQ
Gallon Can: ESG



Seals exposed fibers after any field cuts. Restores gloss and luster to weathered fiberglass.

Seals exposed FRP/GRP threads after installation of fiberglass threaded rod and hex nuts. For polyester and vinyl ester resin products. Clear color.

Meets NSTA and UPS requirements for sea and ground transportation.

Wall Connector

*Substitute EHL for appropriate corresponding tray style

Part No
EHL(H)-(W)-WAC



Gluzilla Adhesive

Part No.
635395

Fiberglass to fiberglass adhesive for custom fabrication or repair.

Meets NSTA and UPS requirements for sea and ground transportation.



* In Part No. Key, parentheses () = insert corresponding option code; Δ = Insert resin designation, see gray box on page 25; H = Side Rail Height, available heights (inches): 3, 4, 6, or 8; W = Width of the inside distance from tray wall to tray wall

Channel-Type Instrumentation Tray

Enduro channel-type instrumentation tray is designed for light loads of individual wiring and pneumatic tubing. Our channel-type tray is available with solid or ventilated bottom.

All straight sections and pre-assembled fittings are pre-drilled to accept flange splice plates. All splice plates and hardware are separate order items.

Enduro's ventilated channel-type tray features 1⁷/₁₆" (36.5125) x 1/4" (6.35) +/- size slots to allow for cooling and cable strapping.

All (mm) dimensions are nominal.

Channel-Type Instrumentation Tray Part Numbers

EI(B) - (Δ) - (W) x (L)

Example: EIS - PE - 200 x 20

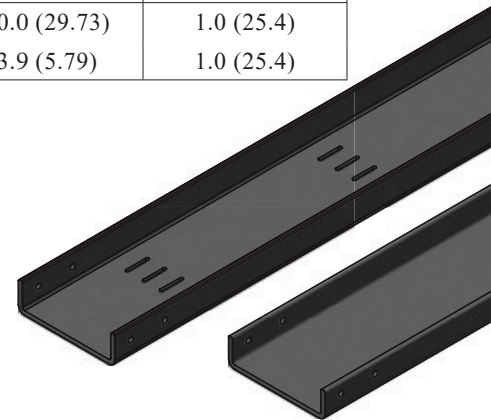
Type	Resin (Δ)	Width (W)	Length (L)
EIS = Solid Bottom	PE = Polyester	200 = 2"	10 = 10'
EIP = Slotted Bottom	VE = Vinyl Ester	300 = 3"	20 = 20'
EIH = Ventilated (Holes) Bottom	RT = Conductive	400 = 4"	3M = 3m
	MS = Polyester Halogen-Free	600 = 6"	6M = 6m
	Y = Halogen-Free Low Smoke Plus	800 = 8"	
		1000 = 10"	

Technical Data - Channel-Type Instrumentation Tray

Part No. Key*	Channel Size Width x Depth	Lbs./Ft.	Channel Thickness	Span Ft. (m)	Max Loading Lbs./Ft. (N/m)	Max Deflection In. (mm)
EI(B)-(Δ)-200 x (L)	2" x 1" (51 x 25)	0.60	3/16" (4.76)	5 (1.5)	4.0 (5.94)	0.5 (12.7)
EI(B)-(Δ)-300 x (L)	3" x 1" (76 x 25)	0.75	3/16" (4.76)	5 (1.5) 8 (2.4)	3.9 (5.79) 1.0 (1.48)	0.5 (12.7) 0.8 (20.3)
EI(B)-(Δ)-400 x (L)	4" x 1 1/8" (102 x 35)	1.05	1/4" (6.35)	8 (2.4) 10 (3.0)	2.8 (4.16) 1.5 (2.23)	0.8 (20.3) 1.0 (25.4)
EI(B)-(Δ)-600 x (L)	6" x 1 3/8" (152 x 41)	2.10	1/4" (6.35)	10 (3.0)	2.8 (4.16)	1.0 (25.4)
EI(B)-(Δ)-800 x (L)	8" x 1 3/4" (203 x 44)	2.80	5/16" (7.94)	10 (3.0)	5.2 (7.73)	1.0 (25.4)
EI(B)-(Δ)-1000 x (L)	10" x 2 3/4" (254 x 70)	4.20	3/8" (9.53)	10 (3.0) 15 (4.5)	20.0 (29.73) 3.9 (5.79)	1.0 (25.4) 1.0 (25.4)

Loads are based on limiting the deflection to a value equal to 1/120 of the span.

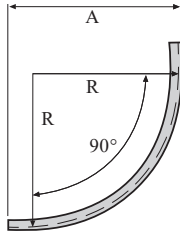
For ventilated tray, max loading reduced by 10%.



Channel-Type Inst. Tray - Fittings & Accessories

90° Vertical Inside Molded

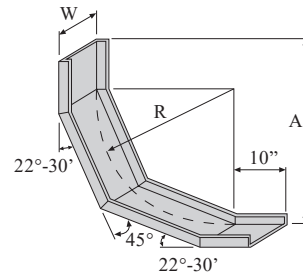
Part No.	Radius	A
EI(B)-(Δ)-MC90IV-18-600	18" (457)	22 ³ / ₄ " (578)
EI(B)-(Δ)-MC90IV-24-400	24" (610)	28 ¹¹ / ₁₆ " (729)
EI(B)-(Δ)-MC90IV-24-600	24" (610)	28 ³ / ₄ " (730)



90° Vertical Inside Mitered

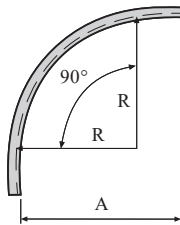
Part No.	A
EI(B)-(Δ)-90IV-(12)-(W)	22 ¹ / ₄ " (565)
EI(B)-(Δ)-90IV-(24)-(W)	34 ¹ / ₄ " (820)

R = Radius which can be 12" (305) or 24" (610); W = Width which can be 2", 3", 4", 6", 8" or 10"; For 10" dimensions contact us.



90° Vertical Outside Molded

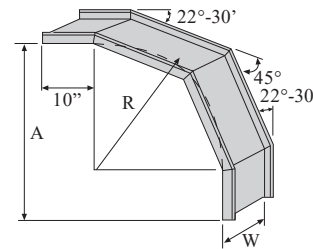
Part No.	Radius	A
EI(B)-(Δ)-MC90OV-12-600	12" (305)	16 ¹ / ₄ " (413)
EI(B)-(Δ)-MC90OV-24-400	24" (610)	28 ⁵ / ₁₆ " (719)
EI(B)-(Δ)-MC90OV-24-600	24" (610)	28 ¹ / ₄ " (718)
EI(B)-(Δ)-MC90OV-24-800	24" (610)	28 ³ / ₁₆ " (716)



90° Vertical Outside Mitered

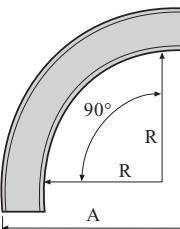
Part No.	A
EI(B)-(Δ)-90OV-(12)-(W)	22" (559)
EI(B)-(Δ)-90OV-(24)-(W)	34" (864)

R = Radius which can be 12" (305) or 24" (610); W = Width which can be 2", 3", 4", 6", 8" or 10"; For 10" dimensions contact us.



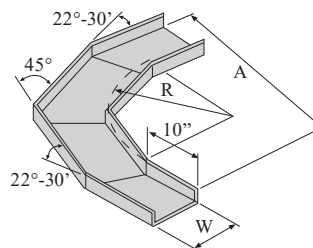
90° Horizontal Molded

Part No.	Radius	A
EI(B)-(Δ)-MC90HB-12-600	12" (305)	22 ³ / ₄ " (578)
EI(B)-(Δ)-MC90HB-24-400	24" (610)	32 ¹³ / ₁₆ " (833)
EI(B)-(Δ)-MC90HB-24-600	24" (610)	34 ³ / ₄ " (883)
EI(B)-(Δ)-MC90HB-24-800	24" (610)	36 ¹ / ₁₆ " (932)



90° Horizontal Bend

	Part No.	A
12" (305) Radius	EI(B)-(Δ)-90HB-12-200	24" (610)
	EI(B)-(Δ)-90HB-12-300	25" (635)
	EI(B)-(Δ)-90HB-12-400	26" (660)
	EI(B)-(Δ)-90HB-12-600	28" (711)
	EI(B)-(Δ)-90HB-12-800	30" (762)
24" (610) Radius	EI(B)-(Δ)-90HB-24-200	36" (914)
	EI(B)-(Δ)-90HB-24-300	37" (940)
	EI(B)-(Δ)-90HB-24-400	38" (965)
	EI(B)-(Δ)-90HB-24-600	40" (1016)
	EI(B)-(Δ)-90HB-24-800	42" (1067)
	EI(B)-(Δ)-90HB-24-1000	44" (1118)



(B) = S for solid
P for Ventilated

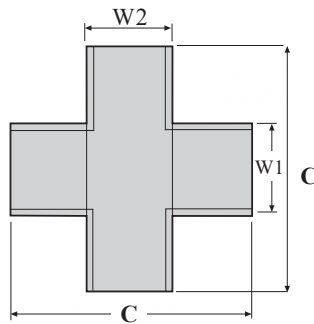
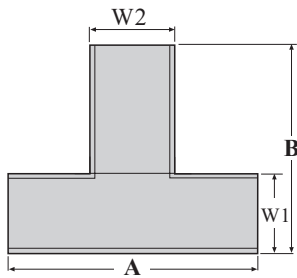
(Δ) = PE for Polyester
VE for Vinyl Ester

NOTE: mm values are nominal; * In Part No. Key, parentheses () = insert corresponding option code;
B = Bottom; Δ = Resin; R = Radius; W = Width of the *inside* distance from tray wall to tray wall

Channel-Type Inst. Tray - Fittings & Accessories

Horizontal Tee & Horizontal Cross

Tee Part No. Key*	Cross Part No. Key*	W1	W2	A	B	C
EI(B)-(Δ)-HT-200	EI(B)-(Δ)-HC-200	2" (51)	2" (51)	18"	18"	19.5"
EI(B)-(Δ)-HT-300	EI(B)-(Δ)-HC-300	3" (76)	3" (76)	18"	18"	19.5"
EI(B)-(Δ)-HT-400	EI(B)-(Δ)-HC-400	4" (102)	4" (102)	18"	18"	19.5"
EI(B)-(Δ)-HT-600	EI(B)-(Δ)-HC-600	6" (154)	6" (154)	18"	18"	19.5"
EI(B)-(Δ)-HT-800	EI(B)-(Δ)-HC-800	8" (203)	8" (203)	20"	18"	21.5"
EI(B)-(Δ)-HT-1000	EI(B)-(Δ)-HC-1000	10" (255)	10" (255)	22"	18"	23.5"



- (B) = S for solid
P for Ventilated
- (Δ) = PE for Polyester
VE for Vinyl Ester
RT for Conductive
MS for Polyester Halogen-Free
Y for Halogen-Free Low Smoke Plus

Channel Tray Cover

Part No. Key*

E(Δ)C-(W)-(L)

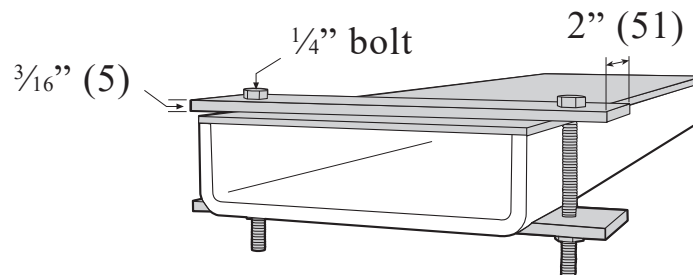
Δ = Resin - insert "P" for polyester resin, insert "Y" for halogen-free low smoke plus resin. Hardware and clamp not included. For other resin part numbers, contact us.

Channel Cover Clamp

Part No. Key*

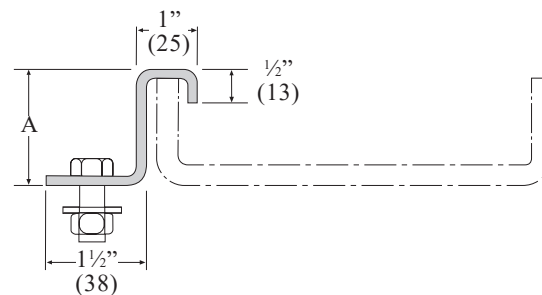
CCC-(W)-(Δ)

Δ = Resin - insert "PE" for polyester resin, insert "Y" for halogen-free low smoke plus resin. 316 SS hardware included. For other resin part numbers, contact us.



Channel Hold Down Clip

Part No. Key	W	A
IHDC-3	3" (76)	1 1/8" (28)
IHDC-4	4" (102)	1 1/4" (33)
IHDC-6	6" (154)	1 3/4" (44)
IHDC-6D	6" (154)	2 1/8" (54)
IHDC-8	8" (203)	1 7/8" (47)
IHDC-10	10" (255)	2 7/8" (72)



Hardware not included. 10 Ga. 316 SS

* In Part No. Key, parentheses () = insert corresponding option code; B = Bottom; Δ = Resin; W = Width of the inside distance from tray wall to tray wall

Channel and Flanged-Type Inst. Tray

Channel-Type Splice Plate Part Numbers

Example: **EISP - 90V - 600**

Degree
 180 = Straight
 90 = 90°
 45 = 45°
 30 = 30°
 22.5 = 22.5°

Direction
 V = Vertical
 H = Horizontal
 (for straight, leave direction space in product number blank, example: EISP-180-600)

Channel Size
 2/3/400 - 2" (50mm) thru 4" (100mm)*
 6/800** - 6" (150mm) and 8" (150mm)*
 1000 - 10" (250mm)*

** Use the 6/800 splices for Flanged-Type Instrument Tray Splices (other than straight splices)

These part numbers are for Polyester resin.

* (mm) values are nominal

Splice plates and hardware are sold individually and are not provided with straight sections or fittings.

For expansion insert "X" between "P" and Degree - Example: EISP-X-180-2/3/400

For Vinyl Ester Resin, add "VE"
 Example: EISP-VE-90V-600/800

For Halogen-Free Polyester Resin, add "HS"
 Example: EISP-HS-90V-600

For Stainless Steel, add "316SS"
 Example: EISP-90V-6/800-316SS

Dimensions

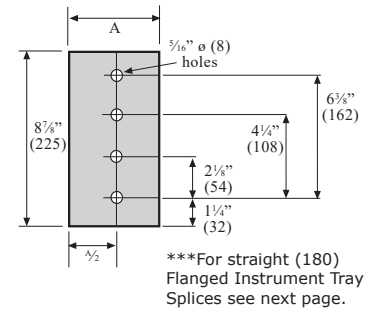
Channel Depth Inches (mm)	A Inches (mm)	B Inches (mm)
2" (51)	1" (25)	½" (12.7)
3" (76)	1" (25)	½" (12.7)
4" (102)	1" (25)	½" (12.7)
6" (152)	1¼" (32)	⅝" (15.875)
8" (203)	1¼" (32)	⅝" (15.875)
10" (254)	2¼" (57)	1⅝" (28.575)
50H	1¼" (32)	⅝" (15.875)
80H	1¼" (32)	⅝" (15.875)

Hardware

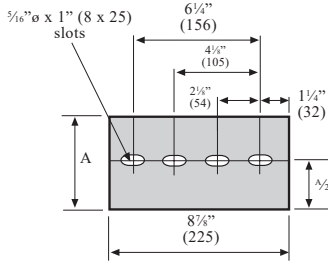
Part No.	
505138SS (Pan Head)	¼" - 20 x ¾"
505139SS	¼" - 20 x ¾"
505141SS	¼" - 20 x 1"
505142SS	¼" - 20 x 1¼"

505138SS, 505139SS, 505141SS for use with all splice plates except 10" channel tray. 505142SS for use with 10" channel tray splice plates. Contact us for pricing and availability.

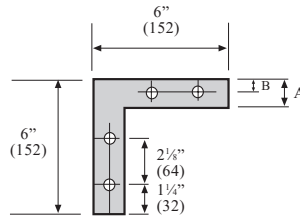
Straight Section



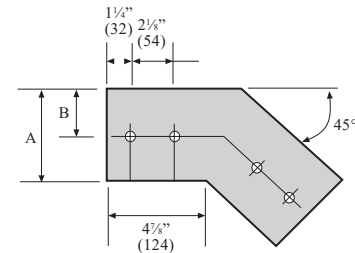
Expansion



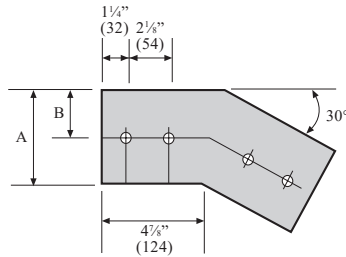
90° Vertical



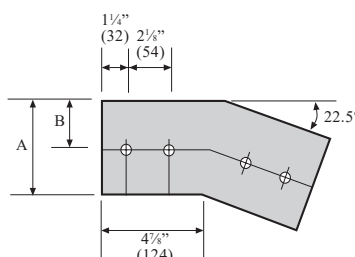
45° Vertical



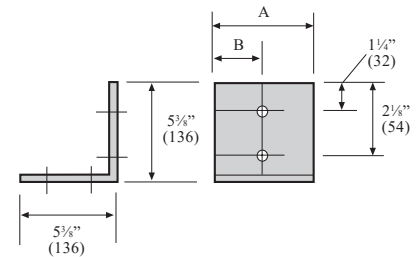
30° Vertical



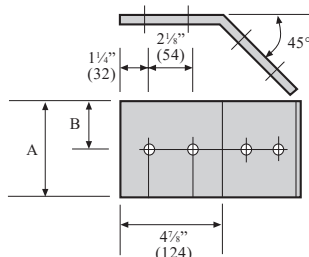
22.5° Vertical



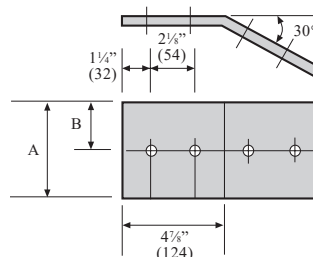
90° Horizontal



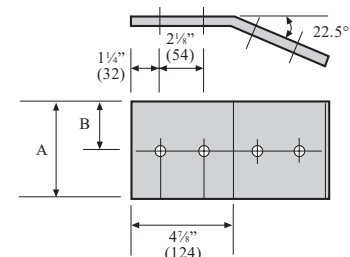
45° Horizontal



30° Horizontal



22.5° Horizontal



Channel Inst. Tray

Flanged-Type Instrumentation Tray

Enduro flanged-type instrumentation tray is ideal for low-voltage or communications cables, including fiber-optic cables, or to support hydraulic or pneumatic tubing. Made from the same high-strength, corrosion-resistant pultruded materials as our ladder-type tray, Enduro instrumentation tray is tough and made to stand up to the most demanding environments.

Enduro flanged tray comes in different resin systems, your choice of solid or perforated bottom, and with or without snap-on covers. Perforated cable trays are predrilled with holes for ventilation or easy attachment of cables. If alternate hole sizes or slots are required, please contact Enduro for additional pricing and lead time.

Our flanged-type instrumentation trays come in depths of 50mm or 80mm, measuring from the outside of the top to the outside of the bottom. Enduro flanged-type tray widths come in 50mm, 100mm, 150mm and 300mm, measuring inside to inside of the flanges. Lengths can be in 3m and 6m. In addition, our offering includes a full complement of fittings, support systems and accessories.



Flanged-Type Straight Section Part Numbers

(Δ) - IT(B) - (H) - CT - (W) - (L)

Example: EP - ITS - 50 - CT - 50 - 3M

<p>Resin (Δ)</p> <p>EP = Polyester EV = Vinyl Ester ERT = Conductive ES = Poly Halogen-Free VS = VE Halogen-Free Y = Halogen-Free Low Smoke Plus</p>	<p>Bottom (B)</p> <p>ITS = Solid Bottom ITP = Perforated Bottom* ITL = Slotted Bottom*</p>	<p>Side Rail Height (H)</p> <p>50 = 50mm (1.97") 80 = 80mm (3.15")</p>	<p>Width (W)</p> <p>50 = 50mm (1.97") 100 = 100mm (3.94") 150 = 150mm (5.91") 300 = 300mm (11.82")</p>	<p>Length (L)</p> <p>3M = 3m (118.1")</p>
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*Please contact us for perforation or slot size.

Technical Data - Flanged Tray

Maximum Loading

Part No.	Span Ft. (m)	Max Loading Lbs./Ft. (N/m)
(Δ)-IT(B)-50-CT-50-3M	5 (1.5)	25.7 (34.8)
	10 (3.0)	3.1 (4.2)
	15 (4.5)	0.9 (1.2)
(Δ)-IT(B)-50-CT-100-3M	5 (1.5)	30.9 (41.9)
	10 (3.0)	3.8 (5.2)
	15 (4.5)	1.1 (1.5)
(Δ)-IT(B)-50-CT-150-3M	5 (1.5)	35.6 (48.3)
	10 (3.0)	4.4 (6.0)
	15 (4.5)	1.3 (1.8)
(Δ)-IT(B)-50-CT-300-3M	5 (1.5)	42.4 (57.5)
	10 (3.0)	5.2 (7.1)
	15 (4.5)	1.5 (2.0)
(Δ)-IT(B)-80-CT-50-3M	5 (1.5)	54.2 (73.9)
	10 (3.0)	6.7 (9.1)
	15 (4.5)	2.0 (2.7)
(Δ)-IT(B)-80-CT-100-3M	5 (1.5)	94.4 (128.0)
	10 (3.0)	11.8 (16.0)
	15 (4.5)	3.5 (4.7)
(Δ)-IT(B)-80-CT-150-3M	5 (1.5)	108.4 (147.0)
	10 (3.0)	13.5 (18.3)
	15 (4.5)	4.0 (5.4)
(Δ)-IT(B)-80-CT-300-3M	5 (1.5)	130.8 (177.3)
	10 (3.0)	16.4 (22.2)
	15 (4.5)	4.8 (6.5)

Load (Lbs/Ft) are based on deflection equal to L/D = 200.
Please contact us for minimum run requirements for non-stock items.

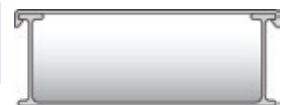
Accessories & Splice Plates

Straight Cover

Part No. Key*

(Δ)-IT-(W)-CTC-(L)

Example: EL-IT-50-CTC-3M
Covers only available in 3m lengths.



Straight Splice Plates

Part No. Key*	Material
ESS-IT-(H)-SSP	Stainless Steel
EP-IT-(H)-SSP	Polyester
EV-IT-(H)-SSP	Vinyl Ester

Stainless Example: ESS-IT-80-SSP; Vinyl Ester Example: EV-IT-80-SSP;
Polyester Example: EL-IT-80-SSP

Reducer Splice Plates

Part No. Key*	Material
ESS-IT-(H)-(W1)-(W2)-RSP	Stainless Steel
E(Δ)-IT-(H)-(W1)-(W2)-RSP	Fiberglass

Please specify Width 1 and Width 2 when ordering.

Hardware

Part No.	Size Range
#505139SS	¼" - 20 x ¾"

Fittings - Flanged-Type Inst. Tray

Flanged-Type Fittings Part Numbers (Δ) - IT(B) - (H) - TYPE - (W) - (A) - (R)

Example: EP - ITS - 50 - HB - 50 - 90 - 300

Resin (Δ)	Bottom (B)	Side Rail Height (H)	Type	Width (W)	Angle
EP=Polyester	ITS=Solid Bottom	50=50mm (1.97")	HB=Horizontal Bend	50=50mm (1.97")	90=90°
EV=Vinyl Ester	ITP=Perforated Bottom*	80=80mm (3.15")	IV=Inside Vertical	100=100mm (3.94")	45=45°
RT=Conductive	ITL=Slotted Bottom*		OV=Outside Vertical	150=150mm (5.91")	
S=Poly Halogen-Free			HT=Horizontal Tee	300=300mm (11.82")	
VS=VE Halogen-Free			HC=Horizontal Cross		
Y=Halogen-Free Low Smoke Plus					

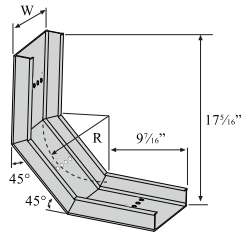
*Please contact us for perforation or slot size.
Note: More fittings and fitting covers available, please contact us.

90° Vertical Inside Mitered

Part No. Key*

(Δ)-(B)-(H)-IV-(W)-90-300

Radius = 11.8" (300mm)

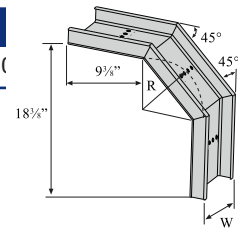


90° Vertical Outside Mitered

Part No. Key*

(Δ)-(B)-(H)-OV-(W)-90-300

Radius = 11.8" (300mm)



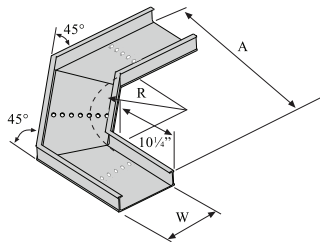
90° Horizontal Mitered

Part No. Key*

A

(Δ)-(B)-50-HB-50-90-300	19 3/8" (493)
(Δ)-(B)-80-HB-50-90-300	
(Δ)-(B)-50-HB-100-90-300	21 3/8" (543)
(Δ)-(B)-80-HB-100-90-300	
(Δ)-(B)-50-HB-150-90-300	23 5/16" (593)
(Δ)-(B)-80-HB-150-90-300	
(Δ)-(B)-50-HB-300-90-300	29 1/4" (743)
(Δ)-(B)-80-HB-300-90-300	

Radius = 11.8" (300mm)



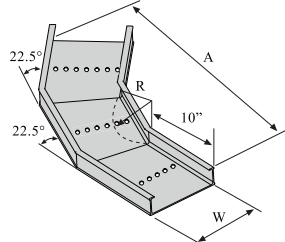
45° Horizontal Mitered

Part No. Key*

A

(Δ)-(B)-50-HB-50-45-300	27 1/16" (688)
(Δ)-(B)-80-HB-50-45-300	
(Δ)-(B)-50-HB-100-45-300	28 1/2" (723)
(Δ)-(B)-80-HB-100-45-300	
(Δ)-(B)-50-HB-150-45-300	29 7/8" (758)
(Δ)-(B)-80-HB-150-45-300	
(Δ)-(B)-50-HB-300-45-300	34 1/16" (865)
(Δ)-(B)-80-HB-300-45-300	

Radius = 11.8" (300mm)



Horizontal Fitting Cover

Part No. Key*

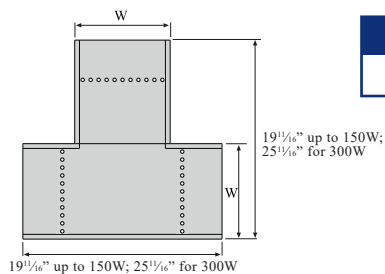
(Δ)-IT-(W)-CTC-(90 or 45)-300



Horizontal Tee

Part No. Key*

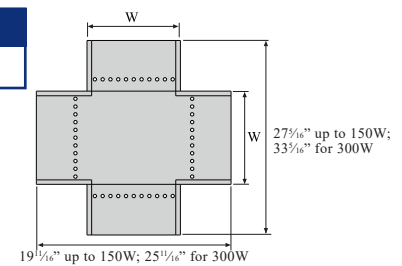
(Δ)-(B)-(H)-(W)-HT



Horizontal Cross

Part No. Key*

(Δ)-(B)-(H)-(W)-HC

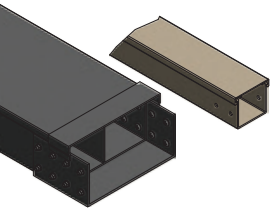


Note: More fittings and fitting covers available, please contact us. * In Part No. Key, parentheses () = insert corresponding option code;
Δ = Resin; B = Bottom; H = Side Rail Height; W = Width of the inside distance from tray wall to tray wall

Wireway

Enduro wireway is designed to protect data control, communication and power cables from atmospheric conditions (like dust, dirt, oil, water) and unauthorized/accidental tampering. Enduro lay-in wireway is often found in:

- Computer, communication, and clean room applications.
Enduro wireway readily conforms to the grid-post system of raised floors.
- Food processing plants
where periodic washdowns often utilize caustic disinfectants
- Transportation/subway systems
where enclosed environments desire telecommunication wireway materials to have low smoke development and non-toxic smoke properties for enhanced public safety



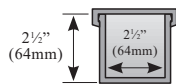
Our wireway straight sections and fittings are provided with a "snap-on / snap-off" cover. It also has a modular design which includes straight sections, elbows, tees and crosses.

Enduro lay-in-wireway is manufactured by the pultrusion process using special fiberglass composite designs and fire-retardant resin formulation for superior strength, durability, and corrosion resistance.

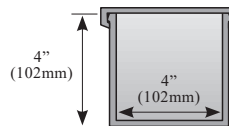
All wireway sections and fittings are available in the five sizes shown below. Please contact us about other available sizes and gasketing. Straight sections and covers come in 10 ft. lengths. Splice plates are a separate order item.

Enduro wireway carries a Class 1 fire rating in accordance with ASTM Standard E-84.

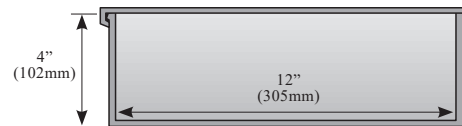
Part No.
CW 250 x 10



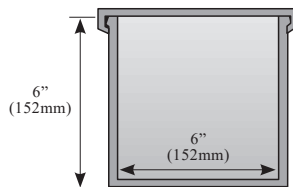
Part No.
CW 404 x 10



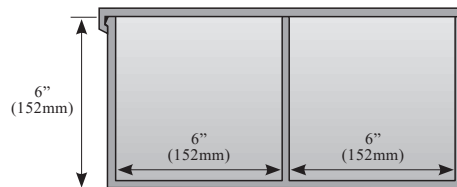
Part No.
CW 412 x 10



Part No.
CW 606 x 10



Part No.
CW 612 x 10

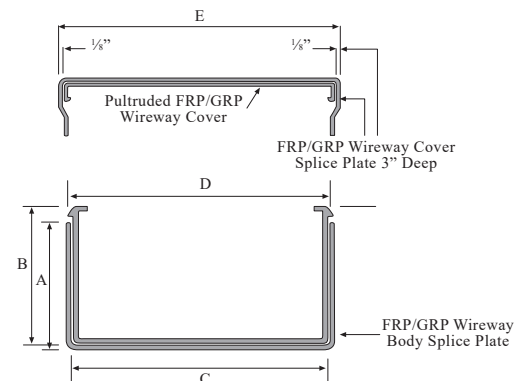


The CW 612 x 10 is available with or without a divider. The divider allows separation of various cables as needed.

Dimensions - Wireway with Cover

Part No.	Dimension Inches (mm)				
	A	B	C	D	E
CW 250 x 10	N/A	2.5" (64)	2.5" (64)	3" (76)	N/A*
CW 404 x 10	3 3/16" (81)	4" (102)	4" (102)	4 3/4" (121)	5 3/8" (136)
CW 412 x 10	3 3/16" (81)	4" (102)	12" (305)	12 3/4" (324)	13 3/8" (340)
CW 606 x 10	5 5/8" (143)	6" (152)	6" (152)	6 3/4" (171)	7 3/8" (187)
CW 612 x 10	5 5/8" (143)	6" (152)	12 3/8" (314)	12 3/4" (324)	13 3/8" (340)

* Cover body and splice plates not available for CW250. See page 37 for splicing method. Please contact us for minimum run requirements for non-stock items.



Wireway

Technical Data - Wireway

Wireway Load Span

Part No.	Maximum Span	Maximum Loading
CW250 x 10	contact us	contact us
CW404 x 10	10' (3m)	10 Lbs/Ft (14.9 kg/m)
CW412 x 10	10' (3m)	12 Lbs/Ft (17.9 kg/m)
CW606 x 10	10' (3m)	20 Lbs/Ft (29.8 kg/m)
CW612 x 10	10' (3m)	25 Lbs/Ft (37.2 kg/m)



Wireway Physical Properties

Electrical

Property	Polyester Fire Retardant	ASTM Test
Electric Strength, Short Term in Oil 1/8", VPM*	200	D149
Electric Strength, Short Term in Oil, KV per inch	35	D149

Other

Property	Polyester Fire Retardant	ASTM Test
Density - Solid Shape Lbs./In.	0.065	D792
Water Absorption (24 Hr. Immersion) Max % by Wt.	0.50	D570
Surface Burning Characteristic, Maximum	25	E84

Thermal

Property	Polyester Fire Retardant	ASTM Test
Thermal Coefficient of Expansion (Inches/Inch/°F)**	5 x 10 ⁻⁶	D696

Longitudinal Direction

Property	Polyester Fire Retardant	ASTM Test
Ultimate Tensile Strength	30,000 PSI	D638
Ultimate Compressive Strength	30,000 PSI	D695
Ultimate Flexural Strength	30,000 PSI	D790

Transverse Direction

Property	Polyester Fire Retardant
Ultimate Tensile Strength	7,000 PSI
Ultimate Compressive Strength	15,000 PSI
Ultimate Flexural Strength	10,000 PSI

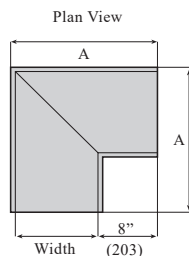
* Specimen tested perpendicular to laminate face.
** Reported value measured in longitudinal direction.

Meets and exceeds test standard for UL 94-VO Flammability Classification and has a flame spread rating under 25 when tested in accordance with ASTM E84.

Fittings - Wireway

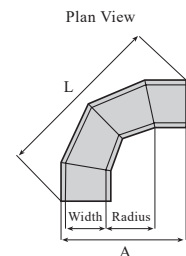
90° Horizontal Direct Bend

Part No.	A
CW 250-90H	8" (203)
CW 404-90H	12 ¹³ / ₁₆ " (325)
CW 412-90H	21" (533)
CW 606-90H	15" (381)
CW 612-90H	21" (533)



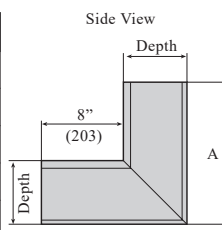
90° Horizontal Bend 12" Radius

Part No.	A	L
CW 250-90H-12	22 ¹ / ₂ " (572)	31 ¹³ / ₁₆ " (808)
CW 404-90H-12	24 ¹³ / ₁₆ " (630)	35" (889)
CW 412-90H-12	33" (838)	46 ⁹ / ₁₆ " (1183)
CW 606-90H-12	27" (686)	38 ¹ / ₈ " (968)
CW 612-90H-12	33" (838)	46 ⁹ / ₁₆ " (1183)



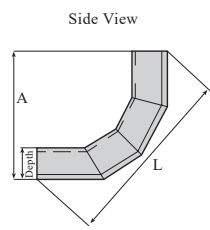
90° Vertical Inside Direct Bend

Part No.	A
CW 250-90IV	10 ¹ / ₂ " (267)
CW 404-90IV	12" (305)
CW 412-90IV	12" (305)
CW 606-90IV	14" (356)
CW 612-90IV	14" (356)



90° Vertical Inside Bend 12" Radius

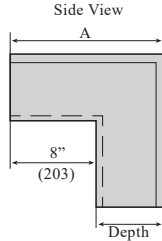
Part No.	A	L
CW 250-90IV-12	17 ¹ / ₁₆ " (446)	24 ¹³ / ₁₆ " (630)
CW 404-90IV-12	18 ¹ / ₈ " (460)	25 ¹¹ / ₁₆ " (652)
CW 412-90IV-12	18 ¹ / ₈ " (460)	25 ¹¹ / ₁₆ " (652)
CW 606-90IV-12	18 ¹ / ₈ " (460)	25 ¹¹ / ₁₆ " (652)
CW 612-90IV-12	18 ¹ / ₈ " (460)	25 ¹¹ / ₁₆ " (652)



Fittings - Wireway

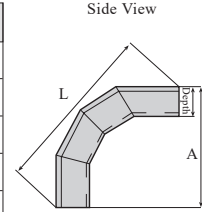
90° Vertical Outside Direct Bend

Part No.	A
CW 250-90OV	10½" (267)
CW 404-90OV	12" (305)
CW 412-90OV	12" (305)
CW 606-90OV	14" (356)
CW 612-90OV	14" (356)



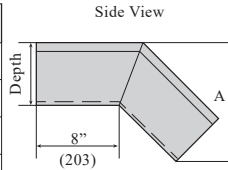
90° Vertical Outside Bend 12" Radius

Part No.	A	L
CW 250-90OV-12	19⅜" (487)	27⅞" (689)
CW 404-90OV-12	22⅝" (562)	31⅜" (797)
CW 412-90OV-12	22⅝" (562)	31⅜" (797)
CW 606-90OV-12	24⅜" (614)	34⅜" (868)
CW 612-90OV-12	24⅜" (614)	34⅜" (868)



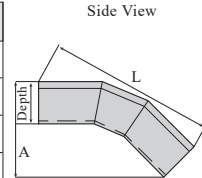
45° Vertical Outside Direct Bend

Part No.	A
CW 250-45OV	8⅞" (205)
CW 404-45OV	10" (254)
CW 412-45OV	10" (254)
CW 606-45OV	12" (305)
CW 612-45OV	12" (305)



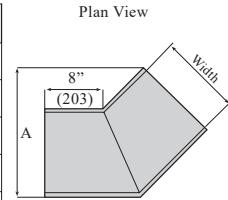
45° Vertical Outside Bend 12" Radius

Part No.	A	L
CW 250-45OV-12	9⅞" (252)	21⅜" (543)
CW 404-45OV-12	12" (305)	23⅞" (595)
CW 412-45OV-12	12" (305)	23⅞" (595)
CW 606-45OV-12	14" (356)	25" (635)
CW 612-45OV-12	14" (356)	25" (635)



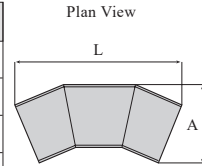
45° Horizontal Direct Bend

Part No.	A
CW 250-45H	8⅞" (205)
CW 404-45H	10½" (267)
CW 412-45H	18⅝" (473)
CW 606-45H	12⅝" (321)
CW 612-45H	18⅝" (473)



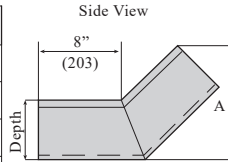
45° Horizontal Bend 12" Radius

Part No.	A	L
CW 250-45H-12	5⅞" (141)	25⅞" (657)
CW 404-45H-12	8⅞" (205)	28⅞" (721)
CW 412-45H-12	16⅜" (411)	34⅞" (878)
CW 606-45H-12	10⅜" (259)	30" (762)
CW 612-45H-12	16⅜" (411)	34⅞" (878)



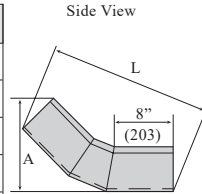
45° Vertical Inside Direct Bend

Part No.	A
CW 250-45IV	8⅞" (205)
CW 404-45IV	10⅝" (264)
CW 412-45IV	10⅝" (264)
CW 606-45IV	11⅜" (284)
CW 612-45IV	11⅜" (284)



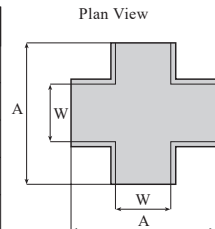
45° Vertical Inside Bend 12" Radius

Part No.	A	L
CW 250-45IV-12	10⅞" (257)	21⅞" (535)
CW 404-45IV-12	11⅞" (287)	21⅜" (552)
CW 412-45IV-12	11⅞" (287)	21⅜" (552)
CW 606-45IV-12	12⅜" (324)	21⅜" (552)
CW 612-45IV-12	12⅜" (324)	21⅜" (552)



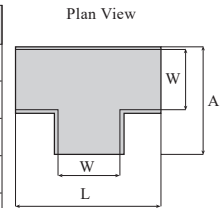
Horizontal Cross Direct

Part No.	A
CW 250-HC	18½" (470)
CW 404-HC	20⅝" (524)
CW 412-HC	28¾" (730)
CW 606-HC	22¾" (578)
CW 612-HC	28¾" (730)



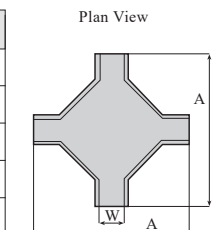
Horizontal Tee Direct

Part No.	A	L
CW 250-HT	10½" (267)	18½" (470)
CW 404-HT	13" (330)	20⅝" (524)
CW 412-HT	21" (533)	28¾" (730)
CW 606-HT	15" (381)	22¾" (578)
CW 612-HT	21" (533)	28¾" (730)



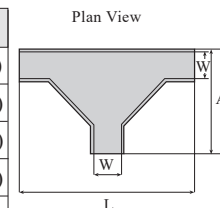
Horizontal Cross 12" Radius

Part No.	A
CW 250-HC-12	42¼" (1073)
CW 404-HC-12	44⅝" (1133)
CW 412-HC-12	52¾" (1140)
CW 606-HC-12	46¾" (1187)
CW 612-HC-12	52¾" (1140)



Horizontal Tee 12" Radius

Part No.	A	L
CW 250-HT-12	22½" (572)	42¼" (1073)
CW 404-HT-12	24⅜" (630)	44⅝" (1133)
CW 412-HT-12	32⅝" (837)	52¾" (1340)
CW 606-HT-12	26⅝" (684)	46¾" (1187)
CW 612-HT-12	32⅝" (837)	52¾" (1340)



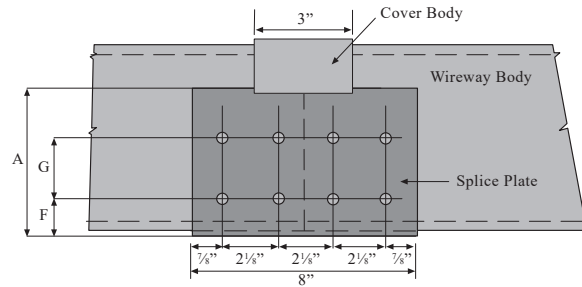
Splice Plates & Accessories - Wireway

Splice Plates - Wireway

Cover Body & Splice Plates

Part No.	A	F	G	Hole Dia.
CW 404 x SP304	3 $\frac{3}{16}$ " (81)	1 $\frac{3}{4}$ " (44)	0	$\frac{7}{16}$ " (11)
CW 412 x SP304	3 $\frac{3}{16}$ " (81)	1 $\frac{3}{4}$ " (44)	0	$\frac{7}{16}$ " (11)
CW 606 x SP304	5 $\frac{3}{8}$ " (136)	1 $\frac{1}{2}$ " (38)	2 $\frac{5}{8}$ " (67)	$\frac{7}{16}$ " (11)
CW 612 x SP304	5 $\frac{3}{8}$ " (136)	1 $\frac{1}{2}$ " (38)	2 $\frac{5}{8}$ " (67)	$\frac{7}{16}$ " (11)

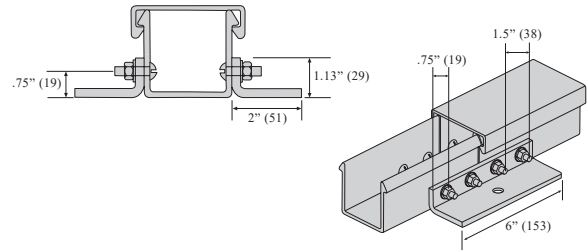
Includes snap-on cover splice plate and bottom plate with 304SS fasteners. If 316SS is required, substitute 316 for 304 in part number.



Wireway CW Hold Down Splice Joint

Part No.
CW250-AC304
CW404-AC304
CW412-AC304
CW606-AC304
CW612-AC304

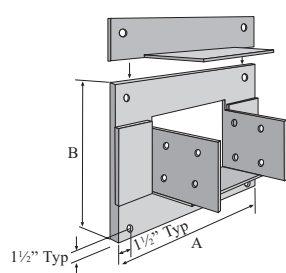
A dual purpose splice plate that offers hold down capabilities. Easily adaptable to other Enduro wireway sizes with or without body splice plate. Standard hold down splice joint material color is gray. Contact us for details regarding a custom color. If 316SS is required, substitute 316 for 304 in part number.



Accessories - Wireway

Panel Adapter

Part No.	A	B
CW 250 - PA	contact us	contact us
CW 404 - PA	10 $\frac{1}{4}$ " (260)	10 $\frac{3}{8}$ " (264)
CW 412 - PA	18 $\frac{1}{4}$ " (463)	10 $\frac{3}{8}$ " (264)
CW 606 - PA	12 $\frac{1}{4}$ " (311)	12 $\frac{3}{8}$ " (314)
CW 612 - PA	18 $\frac{1}{4}$ " (463)	12 $\frac{3}{8}$ " (314)

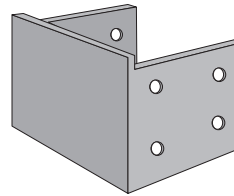


Top plate removable for easy access.

Closure Plate

Part No.
CW 250 - CP304
CW 404 - CP304
CW 412 - CP304
CW 606 - CP304
CW 612 - CP304

Fasteners are 304SS. If required 316SS can be substituted; Example: CW 404-CP-316



Specification - Wireway

1.0 General

- 1.1 This specification covers the requirements for a fiberglass lay-in-wireway system to support and protect power, control and instrumentation cables.
- 1.2 Wireway shall be solid bottom type construction with minimum wall thickness of .1875 inches.
- 1.3 Cover and cover splice plates shall be snap-on type construction requiring no installation fasteners.

2.0 Standards

- 2.1 The wireway system shall conform to the applicable sections of the National Electric Code (NEC) Article 378.
- 2.2 The NEC requires wireway to be supported at intervals not exceeding 5 feet, unless specifically approved for supports at greater intervals, but in no case shall the distance between supports exceed 10 feet.

3.0 Materials

- 3.1 The wireway, cover, and splice plates shall be made from the pultrusion process utilizing an Enduro Fire Retardant Polyester resin formulation with UV light inhibiting additives and exterior veil coverage.
- 3.2 Resin System (as required): Isophthalic Polyester, Vinyl Ester, Halogen-Free Isophthalic Polyester, Halogen-Free Vinyl Ester or Halogen-Free Low Smoke Plus resin available.
- 3.3 All composite material shall meet ASTM E84, maximum 25 flame spread rating.
- 3.4 Color shall be gray.

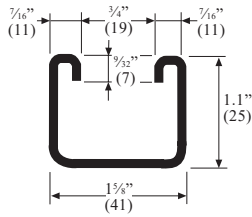
4.0 Loading Capabilities

Consult factory for specific applications.

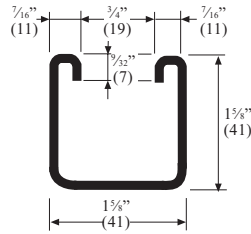
Support Systems & Strut

Channel Framing (Solid & Punched)

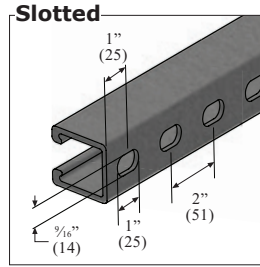
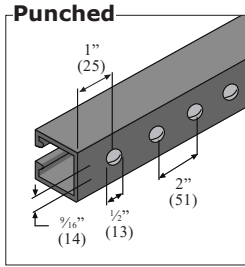
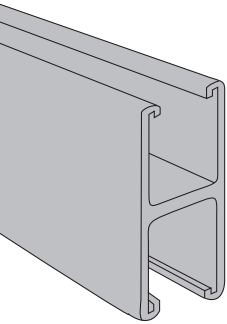
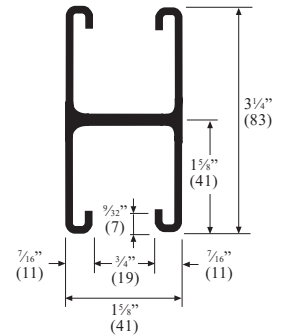
Part No.	Lbs./Ft.
Polyester: EC-10	0.47
Vinyl Ester: EC-VE-10	



Part No.	Lbs./Ft.
Polyester: EC-158	0.68
Vinyl Ester: EC-VE-158	



Part No.	Lbs./Ft.
Polyester: EC-158D	1.36
Vinyl Ester: EC-VE-158D	



For **punched channel framing** add "H" to the end of the part number; example: EC-10H. For **slotted channel framing** add "S" to the end of the part number; example: EC-10S. Punched and slotted not available for double channel. Punched holes are 1/2" holes on 2" centers. Slotted are 1" holes on 2" centers. Replaces drilled strut.

For use in tray support systems, electrical conduit and tray rungs for tying down cable. Available in 10 ft and 20 ft lengths. See below for loading, and see page 41 for specification information.

Technical Data - Support Systems & Strut

Channel Framing Loading Beam and Column Data: Polyester and Vinyl Ester Resin Base

Beam Span or Column Height In.(mm)	Part No.	Maximum Allowable Uniform Beam Load		Deflection @ Maximum Allowable Uniform Beam Load		Uniform Load @ Maximum Deflection = 0.25 In. (6mm)		Uniform Load @ Maximum Deflection = 0.50 In. (13mm)		Maximum Allowable Column Load Lbs.(kg)
		Poly Lbs.(kg)	Vinyl Lbs.(kg)	Poly In.(mm)	Vinyl In.(mm)	Poly Lbs.(kg)	Vinyl Lbs.(kg)	Poly Lbs.(kg)	Vinyl Lbs.(kg)	
12" (305)	EC-10	790 (358)	990 (449)	0.11 (3)	0.12 (3)	-	-	-	-	2550 (1156)
	EC-158	1720 (780)	2150 (975)	0.07 (2)	0.07 (2)	-	-	-	-	3650 (1655)
	EC-158D	5080 (2301)	6350 (2880)	0.04 (1)	0.04 (1)	-	-	-	-	7300 (3311)
18" (457)	EC-10	530 (240)	670 (304)	0.24 (6)	0.27 (7)	-	620 (281)	-	-	2350 (1066)
	EC-158	1150 (521)	1440 (653)	0.15 (4)	0.17 (4)	-	-	-	-	3370 (1528)
	EC-158D	5080 (2301)	4240 (1923)	0.09 (2)	0.10 (2)	-	-	-	-	6740 (3058)
24" (610)	EC-10	400 (181)	500 (227)	0.43 (11)	0.48 (12)	240 (109)	270 (122)	-	-	2070 (939)
	EC-158	860 (390)	1080 (490)	0.27 (7)	0.30 (8)	810 (367)	910 (412)	-	-	2960 (1342)
	EC-158D	2540 (1152)	3180 (1442)	0.16 (4)	0.17 (4)	-	-	-	-	5920 (2685)
30" (762)	EC-10	320 (145)	400 (181)	0.67 (17)	0.75 (19)	120 (54)	140 (63)	240 (109)	270 (122)	1710 (775)
	EC-158	690 (313)	870 (394)	0.42 (11)	0.48 (12)	410 (186)	460 (209)	-	-	2450 (1111)
	EC-158D	2040 (925)	2550 (1156)	0.24 (6)	0.27 (7)	2000 (907)	2350 (1066)	-	-	4900 (2222)
36" (914)	EC-10	270 (122)	340 (154)	0.98 (25)	1.10 (28)	70 (31)	80 (36)	140 (63)	160 (72)	1260 (571)
	EC-158	580 (263)	730 (331)	0.61 (15)	0.69 (19)	240 (109)	270 (122)	480 (217)	540 (245)	1800 (816)
	EC-158D	1700 (771)	2130 (966)	0.35 (9)	0.39 (10)	1220 (553)	1370 (621)	-	-	3600 (1633)
42" (1067)	EC-10	230 (104)	290 (131)	1.32 (34)	1.49 (38)	50 (22)	55 (25)	100 (45)	115 (52)	920 (417)
	EC-158	490 (222)	620 (281)	0.82 (21)	0.92 (23)	150 (68)	170 (77)	300 (136)	340 (154)	1320 (598)
	EC-158D	1460 (662)	1830 (830)	0.48 (12)	0.62 (16)	770 (349)	870 (394)	1510 (650)	1720 (530)	2640 (1197)
48" (1219)	EC-10	200 (91)	250 (113)	1.72 (44)	1.92 (49)	30 (13)	25 (16)	60 (27)	70 (31)	700 (317)
	EC-158	430 (195)	540 (245)	1.07 (27)	1.20 (30)	100 (45)	115 (52)	200 (90)	230 (104)	1010 (458)
	EC-158D	1270 (576)	1590 (721)	0.62 (16)	0.69 (17)	520 (236)	590 (267)	1040 (471)	1170 (780)	2020 (916)
60" (1524)	EC-10	160 (72)	200 (91)	2.68 (68)	2.99 (76)	20 (9)	23 (10)	40 (18)	45 (20)	180 (81)
	EC-158	350 (158)	400 (200)	1.70 (43)	1.91 (48)	60 (27)	70 (32)	120 (54)	135 (61)	260 (118)
	EC-158D	1020 (462)	1280 (580)	0.97 (25)	1.09 (28)	270 (122)	310 (140)	540 (245)	610 (276)	520 (235)
72" (1829)	EC-10	140 (63)	180 (81)	*	*	10 (4)	12 (5)	20 (9)	23 (10)	-
	EC-158	290 (131)	370 (168)	2.44 (62)	2.78 (71)	30 (13)	34 (15)	60 (27)	70 (32)	-
	EC-158D	850 (385)	1070 (485)	1.40 (35)	1.57 (40)	160 (72)	180 (81)	320 (145)	360 (163)	-
84" (2134)	EC-10	120 (54)	150 (68)	*	*	NR	-	12 (5)	15 (7)	-
	EC-158	250 (113)	320 (145)	*	*	20 (9)	23 (10)	40 (18)	45 (20)	-
	EC-158D	730 (331)	920 (417)	1.91 (48)	2.15 (55)	100 (45)	115 (52)	200 (90)	230 (104)	-
96" (2438)	EC-10	100 (45)	130 (59)	*	*	NR	-	-	-	-
	EC-158	220 (100)	250 (113)	*	*	13 (6)	15 (7)	26 (12)	30 (13)	-
	EC-158D	640 (290)	800 (363)	2.50 (63)	2.79 (71)	70 (32)	80 (36)	140 (63)	160 (72)	-

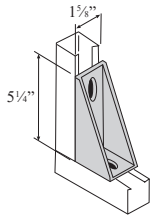
* Deflection is in excess of 3.00 in. (76mm); mid-span support is recommended. NR = Not Recommended; **Beam Loads:** Table lists the total allowable load for various simple spans based on a minimum safety factor 2:1. If load is concentrated at center of span, multiply the load from the table by 0.5 and the corresponding deflection by 0.8. **Column Loads:** Table lists the total allowable axial load for various unsupported column heights based on a minimum safety factor of 3:1. Eccentric loads should be reduced according to standard practice.

Notes: All beams should be supported in a manner to prevent rotation at supports. Long, deep beams should be tied between supports to prevent twist.

Support Systems & Strut

Connector Plates

Based on individual applications, changes may be required on dimension and thickness of material. Please contact us. Holes are drilled to accept $\frac{3}{8}$ " bolts. For Vinyl Ester Connector Plates, insert the letters "VE" as indicated in this example: Polyester = CP-100; Vinyl Ester = CP-VE-100



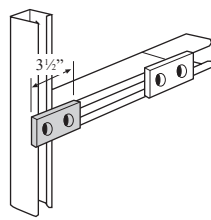
Universal Angle
SEE NOTE AT BOTTOM

Part No.

Polyester: CP-501

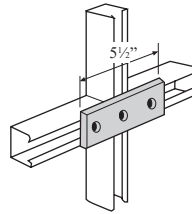
Polyurethane: CP-PU-501

Nylon: CP-NY-501



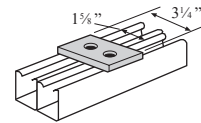
Part No.

CP-100



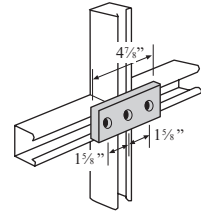
Part No.

CP-101



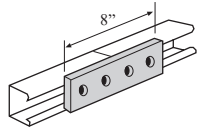
Part No.

CP-102



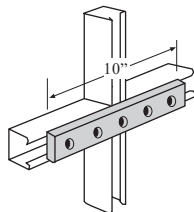
Part No.

CP-103



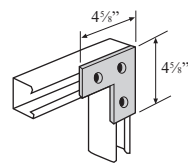
Part No.

CP-104



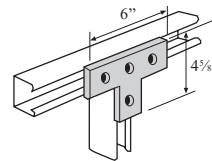
Part No.

CP-105



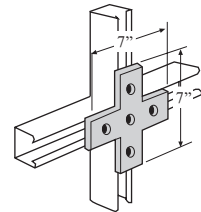
Part No.

CP-109



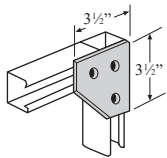
Part No.

CP-110



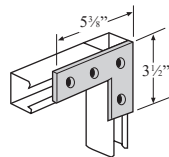
Part No.

CP-111



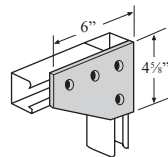
Part No.

CP-112



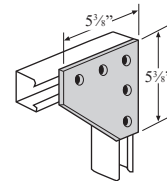
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CP-113



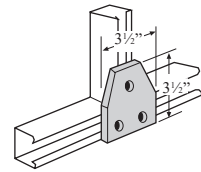
Part No.

CP-114



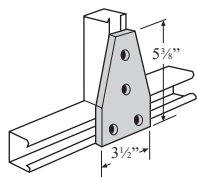
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CP-115



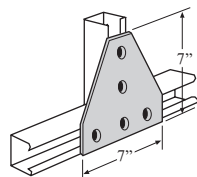
Part No.

CP-116



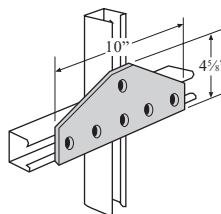
Part No.

CP-117



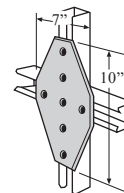
Part No.

CP-118



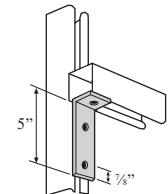
Part No.

CP-119



Part No.

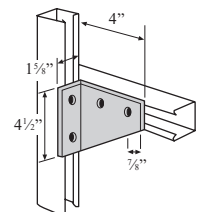
CP-120



Note: Flat washer not required for CP-205

Part No.

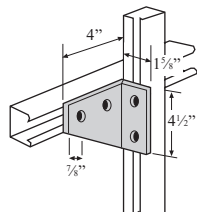
CP-205



SEE NOTE AT BOTTOM

Part No.

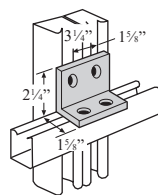
CP-209



SEE NOTE AT BOTTOM

Part No.

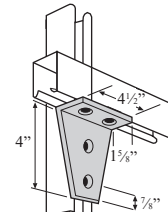
CP-210



SEE NOTE AT BOTTOM

Part No.

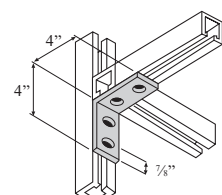
CP-211



SEE NOTE AT BOTTOM

Part No.

CP-226



SEE NOTE AT BOTTOM

Part No.

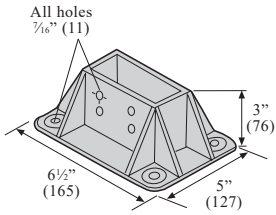
CP-405

NOTE: These composite angle components will not support tensile loads or forces.

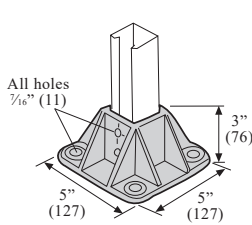
Support Systems & Strut

Post Base

Part No.
Polyester: PBD-PE
Polyurethane: PBD-PU



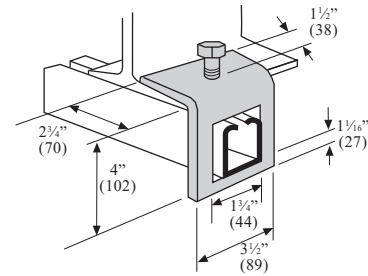
Part No.
Polyester: PBS-PE
Polyurethane: PBS-PU



Window Clamp

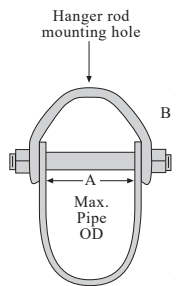
Part No.
WC-158

Stainless steel set screw included



Clevis Hanger

Part No.	Pipe Size	Hanger O.D.	Hanger Rod Dia.
CH-010	3/4" to 1"	2.53"	3/8"
CH-015	1 1/4" to 1 1/2"	3.06"	1/2"
CH-020	2"	3.68"	1/2"
CH-025	3" to 4"	7.04"	1/2"
CH-030	6"	9.36"	1/2"



Polyurethane (PU) resin is the standard. Allowable loads have a 3:1 safety factor at 120°F. Insulation may be required at higher temperatures. Tolerance is 3/4" maximum. For Clevis Hangers sizes 8" to 24" please contact us for pricing and availability.

FRP/GRP Channel Nut

Part No.	Size	Weight	t
CN-025	1/4"-20	5.58 Lbs/C	1 1/16" (27)
CN-038	3/8"-16	5.31 Lbs/C	1 1/16" (27)
CN-050	1/2"-13	5.27 Lbs/C	1 1/16" (27)

Vinyl Ester resin is the standard. Channel nuts are self locking and designed for use with EC-158 and EC-158D strut only.
Resistance to slip = 450 Lbs. per bolt
Pull out strength = 700 Lbs. per bolt
Recommended safety factor = 3

Non-Metallic Universal Pipe Clamp

Conduit Outside Diameter Inches
(for reference only)

Part No.	Pipe Size Inches	Wt./ 100 Sets* Lbs.	PVC Schedule 40 & 80	PVC Coated Steel	Rigid Steel	Fiberglass (FRP/GRP)
PC-1609N	1/2	9.0	0.840	0.920	0.840	-
PC-1610N	3/4	10.0	1.050	1.130	1.050	0.890
PC-1611N	1	10.5	1.315	1.395	1.315	1.195
PC-1612N	1 1/4	11.0	1.660	1.740	1.660	1.507
PC-1613N	1 1/2	13.0	1.900	1.980	1.900	1.757
PC-1614N	2	14.0	2.375	2.455	2.375	2.132
PC-1615N	2 1/2	18.0	2.875	2.955	2.875	2.650
PC-1616N	3	20.0	3.500	3.580	3.500	3.132
PC-1617N	3 1/2	23.0	4.000	4.080	4.000	3.632
PC-1618N	4	25.0	4.500	4.580	4.500	4.132

* Includes nylon bolt

For rigid, PVC coated steel, PVC Schedule 40 & 80 and fiberglass conduit.

Made from a toughened grade of glass reinforced polycarbonate resin. Standard fasteners are nylon slotted hex bolt and nut. Recommended for horizontal use as shown. For vertical placement please contact us.

Packaged 10 sets per bag.

If stainless steel fasteners are preferred, indicate by adding the letter "S" after the catalog number (Example: PC-1609S).

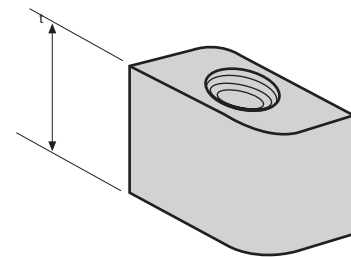
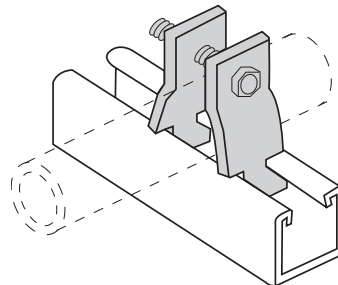
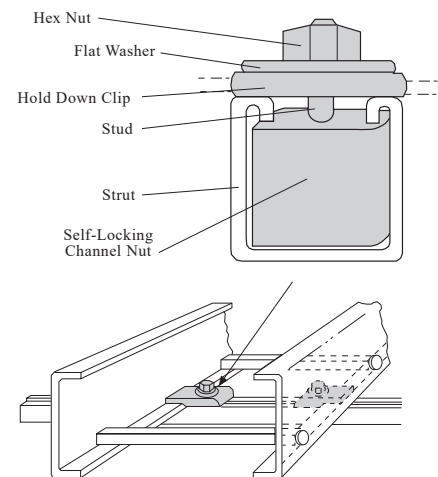


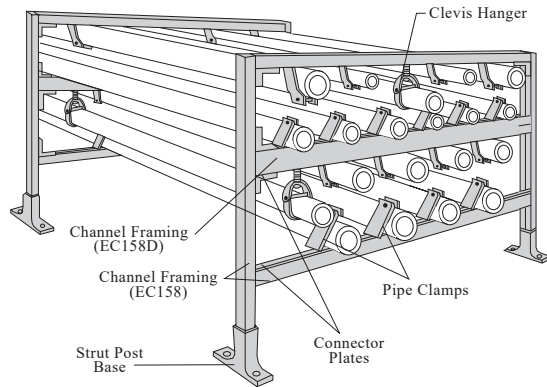
Diagram: FRP/GRP Channel Nut with Hold Down Clip



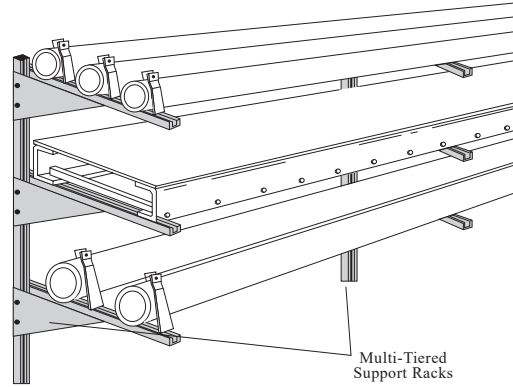
Typical Installations - Support Systems & Strut

Enduro's DuroStrut combined with our cable tray accessories are functional in many non-cable tray applications. DuroStrut includes all the items necessary to field fabricate to your specifications whether wall, floor, or ceiling mounted. Enduro can also assist in engineering to your requirements. The information published are guideline suggestions for the design professional. Full-scale proof testing of installation is recommended to verify assembly at site. If you need a special shape or assembly, call Enduro for information on custom pultrusions and fabrications.

Pipe Support Racks Sample Installation



Wall Stanchion Sample Installation



FRP Structural Shapes and Flat Sheets

Channel		Unusual Channel		Angle		Square Tube		Flat Sheet (Construction Grade)	
Size in Inches	Lbs/Ft	Size in Inches	Lbs/Ft	Size in Inches	Lbs/Ft	Size in Inches	Lbs/Ft	Size in Inches	Lbs/Ft
2 x 1 x 3/16	0.37	4 3/4 x 3 1/4 x 1/4	2.06	1 x 1 x 1/4	0.17	2 x 2 x 1/8	0.90	1/8 thickness	1.41
3 x 1 x 3/16	0.68	6 7/8 x 5 3/8 x 1/4	3.08	2 x 2 x 1/4	0.69	2 x 2 x 1/4	1.40	3/16 thickness	1.71
4 x 1 1/8 x 1/4	1.13	Round Tube		3 x 3 x 3/8	1.53	2 x 2 1/2 x 1/4*	1.55	1/4 thickness	2.34
6 x 1 5/8 x 1/4	1.70	2 3/8 x 1/4	1.45	4 x 4 x 3/8	2.09	2 1/2 x 2 1/2 x 1/4	1.70	3/8 thickness	3.35
6 x 1 5/8 x 5/16	2.10	Wide Flange Beam		4 5/8 x 1 5/8 x 1/8	0.83	3 x 3 x 1/4	2.20	1/2 thickness	4.03
6 x 2 x 3/16	1.53	6 x 6 x 3/8	5.30	5 x 5 x 3/8	2.81	3 x 4 x 1/4	2.51		
8 x 1 3/4 x 5/16	2.50			6 x 6 x 3/8	3.35	4 x 4 x 1/4	3.25		
10 x 2 3/4 x 3/8	4.27					6 x 6 x 1/4	4.70		

*Non stock item, minimum run required.

All are available in polyester and vinyl ester. Stocking lengths are 10' or 20' Flat sheet is available in 3' x 10' pieces. Contact us for required shapes not listed.

Specification - DuroStrut

1.0 Scope

1.1 This specification covers the requirements for Enduro non-metallic Channel Framing Systems & Accessories

2.0 Standards

- 2.1 All channel shall have a flame spread rating of 25 or less, and the Smoke Developed Index shall have a density of 450 or less when tested in accordance with the provisions of ASTM E-84; therefore qualifying as a class 1 material in the Uniform Building Code
- 2.2 All channel shall have a surfacing veil over the entire surface in addition to a UV inhibitor in the resin system to protect against degradation from ultra-violet light.
- 2.3 Glass-reinforced channels covered in this specification shall comply with the requirements of ASTM D 3917 and ASTM D 4385 which govern the dimensional tolerance and visual defects of pultruded shapes.

3.0 Materials

- 3.1 FRP channel shall be of pultruded glass-reinforced isophthalic polyester or vinyl ester resin having the physical property values listed in this catalog.
- 3.2 Some accessories shall be of injection molded, 40% long glass fiber reinforced polyurethane, or nylon.

- 3.3 All channel shall be manufactured by the pultrusion process, and contain a minimum of 50% glass by weight.
- 3.4 All channel shall conform, as a minimum requirement, to loads and deflections shown on the tables in the latest version of the Enduro technical catalog.

4.0 Non-Metallic Pipe Clamps

- 4.1 All pipe clamps shall be manufactured by the injection molding process with an impact modified, 30% glass filled thermoplastic polyester resin.
- 4.2 All pipe clamps interlock with the channel framing described above.
- 4.3 All pipe clamps shall be designed for rigid PVC coated steel, Schedule 40 and 80 PVC, and filament wound fiberglass pipe or conduit. Clamps shall be adjustable to accommodate a 3/4" minimum deviation in O.D. size.

5.0 Fasteners

- 5.1 All fasteners shall be injected molded glass reinforced nylon, 316 stainless steel, or pultruded vinyl ester rod with ground threads and compression molded vinyl ester nuts.

6.0 Acceptable Manufacturer

- 6.1 DuroStrut is manufactured and fabricated exclusively by Enduro Composites, Inc. - Houston, TX.

Fastener & Hanging Systems

Enduro fastener and hanging systems are exceptionally strong non-metallic mechanical systems with outstanding shear and tensile strengths. This makes the Enduro fastener system an excellent choice for all structural, mechanical and electrical applications where fasteners must be corrosion-resistant and/or non-conductive. It is not recommended that FRP/GRP threaded rod be used in conjunction with steel or PVC coated steel beam clamps or nuts. Thread shear could occur due to insufficient thread engagement.

FRP/GRP Threaded Rod

Part No.	Size	Weight
TR-FRP-038	3/8"-16	0.07 Lbs/Ft
TR-FRP-050	1/2"-13	0.12 Lbs/Ft
TR-FRP-0625	5/8"-11	0.18 Lbs/Ft
TR-FRP-075	3/4"-10	0.28 Lbs/Ft
TR-FRP-100	1"-8	0.50 Lbs/Ft

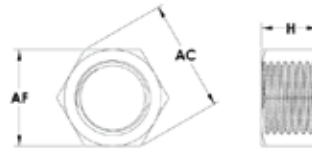
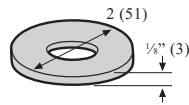


Hex Nut

Part No.	Thread Size	Height	AF	AC
NUT 3/8" HEX NUT	3/8"-16	.337-.320"	.563-.551"	.650-.628"
NUT 1/2" HEX NUT	1/2"-13	.448-.427"	.750-.736"	.866-.84"
NUT 5/8" HEX NUT	5/8"-11	.559-.535"	.938-.922"	1.083-1.051"
NUT 3/4" HEX NUT	3/4"-10	.665-.617"	1.125-1.088"	1.299-1.24"
NUT 1" HEX NUT	1"-8	.887-.831"	1.5-1.45"	1.732-1.653"

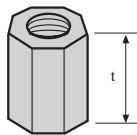
FRP/GRP Flat Washer

Part No.	Size	Weight
FW-FRP-038	3/8"-16	1.3 Lbs/C
FW-FRP-050	1/2"-13	1.3 Lbs/C
FW-FRP-0625	5/8"-11	1.3 Lbs/C
FW-FRP-075	3/4"-10	1.3 Lbs/C
FW-FRP-1000	1"-8	1.3 Lbs/C



FRP/GRP Rod Coupler

Part No.	Size	Weight	t
RC-FRP-038	3/8"-16	7.80 Lbs/C	2" (51)
RC-FRP-050	1/2"-13	7.00 Lbs/C	2" (51)
RC-FRP-0625	5/8"-11	13.73 Lbs/C	2" (51)
RC-FRP-075	3/4"-10	12.66 Lbs/C	2" (51)
RC-FRP-1000	1"-8	44.03 Lbs/C	2 3/4" (70)

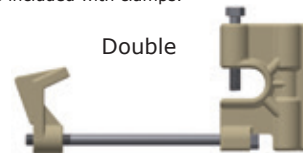


Vinyl Ester resin is the standard.
IMPORTANT: Minimum thread engagement must be 3/4" per side.

Beam Clamps

Part No.	Description
BCS-3/8	Single for 3/8" FRP/GRP Threaded Rod
BCS-1/2	Single for 1/2" FRP/GRP Threaded Rod
BCD-3/8	Double for 3/8" FRP/GRP Threaded Rod
BCD-1/2	Double for 1/2" FRP/GRP Threaded Rod

Ultimate load = 300 Lbs. Recommended safety factor = 3
SS set screws included with clamps.



Typical Properties - FRP/GRP Threaded Rod

Properties	3/8-16 UNC	1/2-13 UNC	5/8-11 UNC	3/4-10 UNC	1-8 UNC
Thread shear strength using FRP/GRP hex nut in tensile - Lbs.	1,250	2,200	3,100	4,500	6,500
Transverse shear on threaded rod - double shear (load Lb.) (ASTM-B565)	3,000	5,000	7,500	12,000	22,000
Transverse shear on threaded rod - single shear (load Lb.)	1,600	2,600	3,800	6,200	15,000
Compressive strength longitudinal, PSI (ASTM-D695)	54,000	54,000	54,000	54,000	65,000
Flexural strength, PSI (ASTM-D790)	55,000	55,000	55,000	55,000	60,000
Flexural modulus, PSI x 10 ⁶ (ASTM-D790)	2.0	2.0	2.0	2.50	2.75
Torque strength using fiberglass nut lubricated with SAE 10W30 motor oil, Ft.-Lbs.	8	18	35	50	110
Dielectric strength, KV/In. (ASTM-D149)	35	35	35	35	35
Water absorption 24 hour immersion - threaded, % (ASTM-D570)	1	1	1	1	1
Coefficient of thermal expansion - longitudinal In./In./°F	5 x 10 ⁻⁶	5 x 10 ⁻⁶	5 x 10 ⁻⁶	5 x 10 ⁻⁶	5 x 10 ⁻⁶
Max recommended operation temp - based on 50% retention of ultimate thread shear strength °F (°C)	200°(93°)	200°(93°)	200°(93°)	200°(93°)	200°(93°)
Stud weight, Lb./Ft.	0.07	0.12	0.18	0.28	0.50
Flammability	Self-extinguishing on all				

Note: 1 Ft.-Lb. = .138 kg-M; 1 Lb = .4536 kg; 1 PSI = 6.984 K Pa; Test results are for studs with single FRP/GRP hex nuts only, stainless steel nuts will result in reduced values. Proper safety factors should be applied to testing. All values are based on laboratory test results.

Fastener & Hanging Systems - Installation Guide

The Enduro fastener system is a vinyl ester resin and fiberglass composite with unique characteristics which make it ideal for many applications where high strength, non-metallic fasteners are required.

For Access After Installation

If the assembly will require occasional removal of the nuts, the rod should be lightly coated with a dry lubricant, silicon spray, or a light oil prior to assembly.

For Permanent Installation

If the assembly is designed to be a permanent installation, the nuts and studs should be bonded with an epoxy adhesive.

Apply a light coating of adhesive to the stud and nut threads, then quickly secure the assembly before adhesive has time to set, otherwise the mil thickness of the adhesive will make it impossible to thread. Next, apply a thick coat of adhesive to the exposed stud and nut surfaces. This provides a locking mechanism which eliminates the need for extra torque and lock washers.

For Hanging System Installation

The optimum method of installation for a hanger system is to finger tighten the assembly and then only tighten the nuts one-half turn to secure any jam nut assemblies. Follow the permanent installation procedure whenever possible. This results in minimum torque and allows maximum thread shear.

To ensure maximum resistance to chemical attack once the assembly is completed, the exposed stud thread and nut surfaces should be coated with Enduro's Field Cutting Sealant (Part No. ES-Q or ES-G; see pg. 27).

Metal & FRP/GRP Installation

When utilizing metal fasteners, connectors, or nuts, consideration must be given to reduced strengths. Enduro rod and nuts are designed with maximum thread engagement and extra nut thickness. Metal products have less thread engagement. When installation requires metal components, special tests may be necessary to define ultimate strengths of the fastener systems.

For Beam Clamp Installation

Maximum installation torque of 10 foot-pounds is recommended to secure set screw.

Site Conditions

Vibration and dynamic loading conditions on the Enduro fastener assembly should be eliminated or minimized. If this is not possible, additional safety factors should be used in designing the fastener system.

Tools Required

The oversize hex nut design of the Enduro nut requires a larger than normal socket wrench, but either a six point or twelve point socket will work.

Important - do not exceed the torque values listed in the table above.

Caution

Do not over torque the Enduro nut and rod. The thread shear and torque values are NOT mutually exclusive, they are additive

Example

1/2" - 13 has a thread shear of 2,200 Lbs. and an ultimate torque strength of 18 ft-lbs. If you use the maximum installation torque of 8 ft-lbs, the amount of thread shear remaining is reduced to 1,225 lbs.

Specifying engineers should apply this information at the design stage, applying the proper safety factors to ensure a secure installation.

Trapeze System

Part No	Cable Tray Width
8" TRAPEZE	4"
10" TRAPEZE	6"
16" TRAPEZE	12"
22" TRAPEZE	18"
28" TRAPEZE	24"
40" TRAPEZE	36"

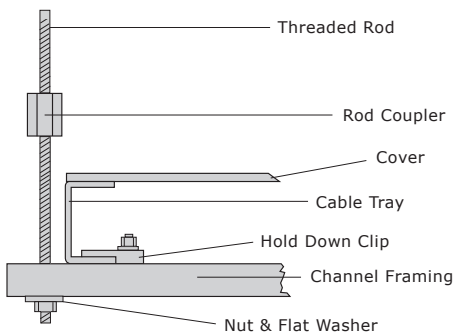
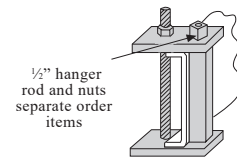
Note: Trapeze parts do not include cable tray, hold down clip, covers, threaded rod, or rod coupler.

Vertical Tray Hanger Support

Part No. Key*

VH-(H)(Δ)

Not available for EHZ6.

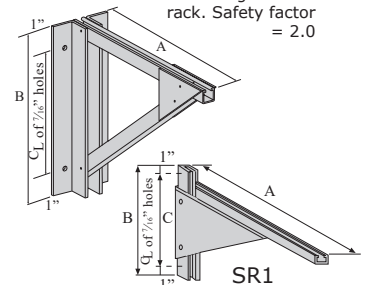


Typical Hanging Support System

Cable Tray Support Racks

Part No. Key*	Dimension In.			Allowable Load Lbs.
	A	B	C	
SR1-6(Δ)	10"	12"	10"	1,600
SR1-9(Δ)	13"	12"	10"	1,100
SR1-12(Δ)	16"	12"	10"	850
SR1-18(Δ)	22"	12"	10"	725
SR1-24(Δ)	28"	12"	10"	480
SR2-24(Δ)	26"	21"	15"	750
SR2-30(Δ)	32"	21"	15"	750
SR2-36(Δ)	38"	21"	15"	750

Allowable load is based on a total load, uniformly distributed over the length of the rack. Safety factor = 2.0



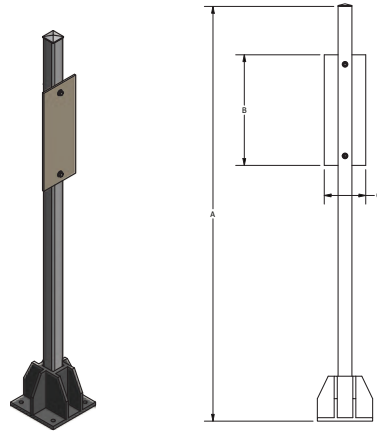
Instrument & Pushbutton Stands

FRP INSTRUMENTATION & PUSHBUTTON STANDS

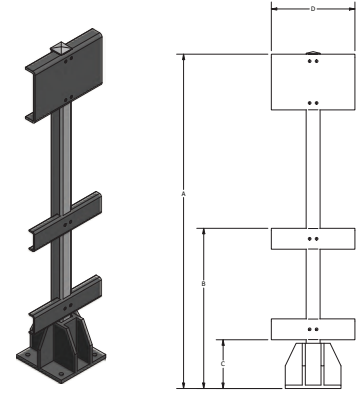
Enduro instrumentation and push-button stands are built to almost any configuration including single, double, or triple arms, various mountings, and large panel design for switch rack stations.

Pushbutton Stations are made with pultruded FRP 2" square tube and compression molded connectors and 8" square base. Standard control panels are FRP flat plate with option for 10" FRP channel.

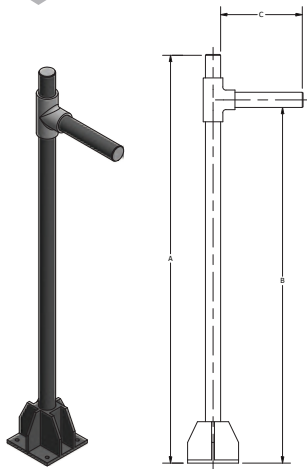
Instrumentation Stands are made with pultruded FRP round tube and compression molded connectors and 8" square base.



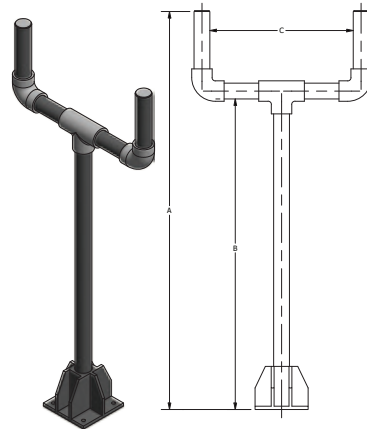
Push Button Floor Stand
PBFLS x A x B x C



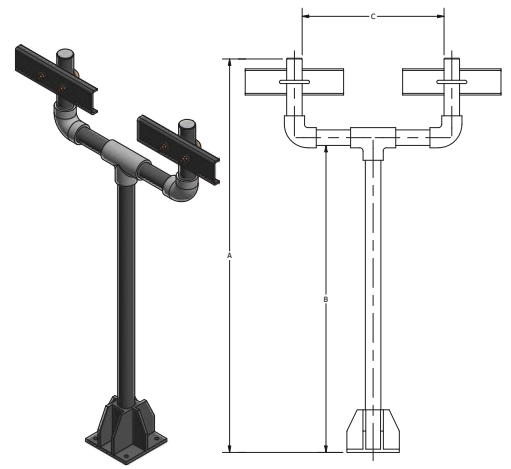
Push Button w/ Channel
PBC x A x B x C x D



Floor Stand Single
FLS1 x A x B x C



Floor Stand Double
FLS2 x A x B x C



Floor Stand Double w/ Channel
FLS2C x A x B x C

FLOOR STAND SIZES (inches)

CUSTOM SIZES AVAILABLE. Contact factory.

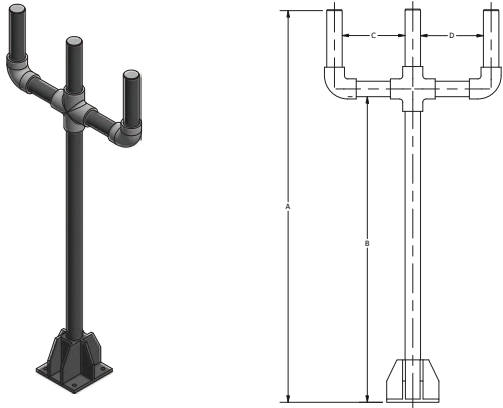
DESCRIPTION	CATALOG PART #	A	B	C	D
Push Button Floor Stand	PBFLS x A x B x C	48 60	16	6	—
Push Button w/ Channel	PBC x A x B x C x D	48 60	23	7	12
Floor Stand Single	FLS1 x A x B x C	48 60	48 52	13	—
Floor Stand Double	FLS2 x A x B x C	48 60	36 48	18 24	—
Floor Stand Double w/ Channel	FLS2C x A x B x C	48 60	36 48	18 24	—
Floor Stand Triple	FLS3 x A x B x C x D	48 60	36 48	12	12
Floor Stand Triple w/ 2 bases	FLS32 x A x B x C x D	48 60	36 48	12	12

* In Part No. Key, parentheses () = insert corresponding dimension

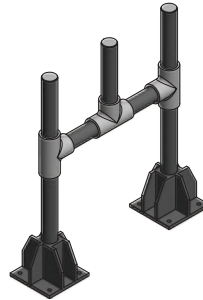
Instrument & Pushbutton Stands

FLOOR STANDS & WALL MOUNTS

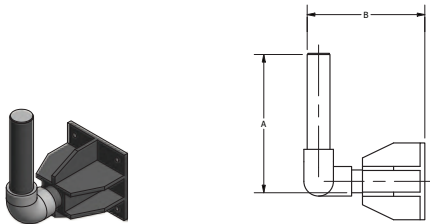
Floor Stands and Wall Mounts are made with pultruded FRP 2" round tube and compression molded connectors and 8" square base.



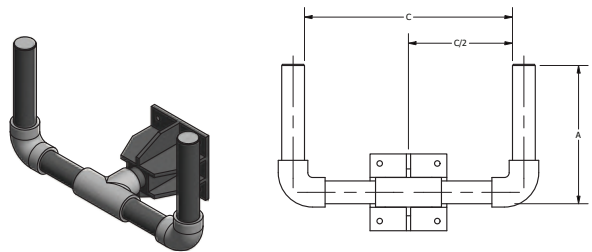
Floor Stand Triple FLS3 x A x B x C x D



Floor Stand Triple w/ 2 bases FLS32 x A x B x C x D



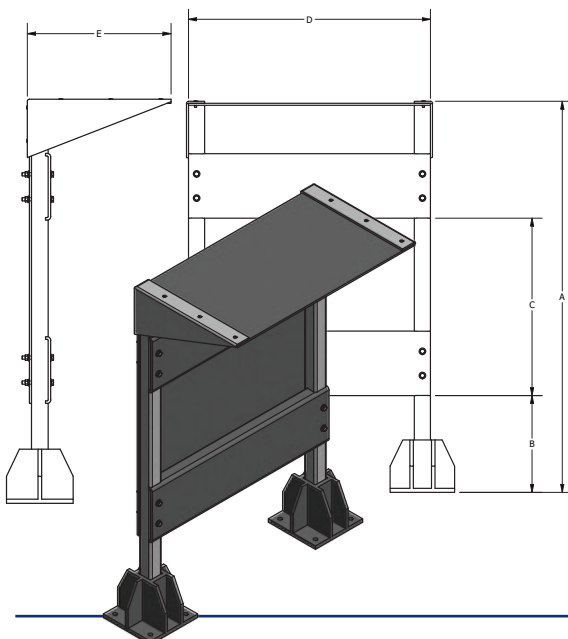
Wall Mount Single WM1 x A x B



Wall Mount Double WM2 x A x B x C

WALL MOUNT SIZES (inches) *CUSTOM SIZES AVAILABLE. Contact factory.*

DESCRIPTION	CATALOG PART #	A	B	C
Wall Mount Single	WM1 x A x B	12 18	12	—
Wall Mount Double	WM2 x A x B x C	12 18	12	18 24



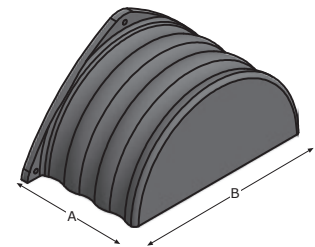
SWITCHRACKS

Switchracks are made with pultruded FRP 2" square tube and compression molded connectors and 8" square base.

Switchrack Covered

SWRC x A x B x C x D x E

Set E = 0 for no cover portion



HOSE RACK

Colors available:

- Fire Hose Red
- Service Hose Green

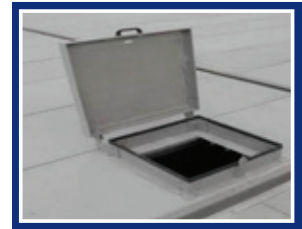
HOSE RACK SIZES (inches)

CATALOG PART #	A	B
Hose Rack	16 1/8	31 3/4

Enduro Environmental Products

FRP/GRP Tank Cover

- Compression Sealed for Effective Odor Control
- Removable Panels for Easy Access
- Walkable Non-skid Surface
- Less Headspace Over Water for Efficient Odor Processing
- Customized to Your Application



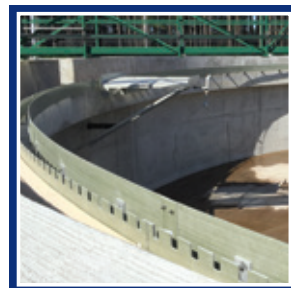
FRP/GRP Baffle Wall

- UL Certified to NSF ANSI standard 61
- Easy Installation
- Baffle Options:
 - Removable Panels
 - Flexible Design
 - Access Doors
 - Solid or Perforated
- Customized to Your Application



FRP/GRP Clarifier Products

- Weirs and Scum Baffles
- Density Current Baffles
- Launder Covers
- Launder Trough Systems



Enduro Third Rail Cover Board For Light Rail & Mass Transit Systems

Enduro third rail cover boards are custom designed to provide safety by shielding or insulating personnel from a rail that is "live" or may contain stray currents. Our fiberglass light rail covers are made of high-performance, lightweight pultruded composites. Enduro has exceeded the most stringent of transportation safety tests utilizing our Halogen Free Low Smoke Plus resin technology that provides the highly desired low smoke development and low toxicity characteristics preferred by transportation safety authorities.



Enduro Building Products

Enduro FRP/GRP Building Panels

World-Leading Industrial Building Panels

For demanding structural and environmental conditions, Enduro Tuff Span® FRP/GRP Building Panels deliver unsurpassed performance as industrial roofing and siding.

Strength

In FRP/GRP materials, strength and stiffness is determined by the alignment and amount of its glass fiber reinforcements.

Tuff Span® is constructed with high reinforcing content placed in straight and continuous, bidirectional alignment. As a result, Tuff Span® has higher strength and stiffness of any profiled FRP/GRP Building Panel and history of standing up to hurricane winds where aged metal, cementitious, and other materials have failed.

Corrosion Resistance

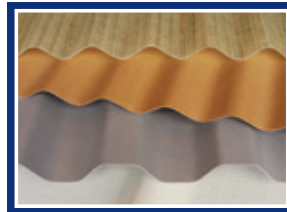
To resist attack from aggressive chemical exposure, Tuff Span® is formulated with premium resin systems, Iso-Polyester or Vinyl Ester.

UV Protection

Extended and superior UV protection is provided by an exterior acrylic coating, UV stabilized resin, embossed resin-rich surface, and interior mat or veil.

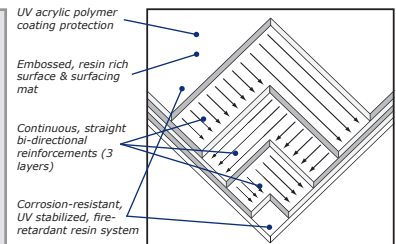


Fertilizer storage facility installed with Enduro Tuff Span® roofing & siding panels



Opaque Colors	Translucent Colors	
Gray	Gray	Clear
White	White	Green
Beige	Beige	Daylight Blue
Stone White	Stone White	Gray Mist
Shale	Shale	

Enduro has the ability to produce colors matched to existing structures. More colors available, contact us.



Enduro Tuff Span® FRP/GRP panels are the strongest of any profiled FRP/GRP building panel.

More Enduro Tuff Span® Products

For a complete FRP system, Enduro offers other building products designed specifically for corrosive applications & environments.

- Beams**
- Louvers**
- Ridge Vents**
- Gutter Systems**
- Channel**
- Angle**
- Tube**
- Wide Flange**
- Flat Plate Sections**



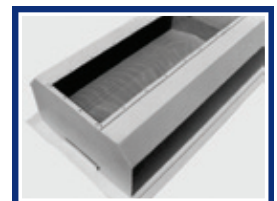
Enduro FRP/GRP structural members at a water treatment plant



Enduro FRP/GRP primary & secondary beams



Enduro FRP/GRP louvers on an offshore platform off the Gulf Coast



Enduro FRP/GRP Ridge Vent

composites
enduro



**CABLE
MANAGEMENT**

endurocomposites.com

elsales@endurocomposites.com

HOUSTON

16602 Central Green Blvd.

Houston, TX 77032

800.231.7271

SAUDI ARABIA

P.O. Box 4779 Al-Khobar 31952

Kingdom of Saudi Arabia

966.3.8128630



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