ARGOSFRP™

SOLUTIONS FOR CORROSIVE ENVIRONMENTS

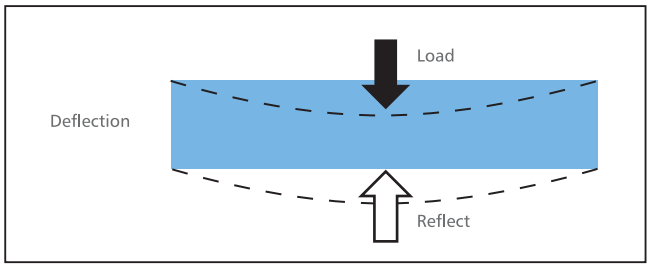
PULTRUDED FRP / GRP

CABLE LADDER & TRAY

The Material of The Future

FRP (Fibreglass Reinforced Plastic) is produced from a combination of fiberglass reinforcements and thermosetting resins.
Since its introduction, this special millennium product has gained wide acceptance for its superior benefits and is presently used all over the world.

PULTRUSION is a process whereby glass fibre (Roving) is continuously pulled through a liquid resin bath until it reaches a heated die at the exit of the line. Here, the resin solidifies into the different profiles according to the various moulds. (Refer to diagram on page 2)



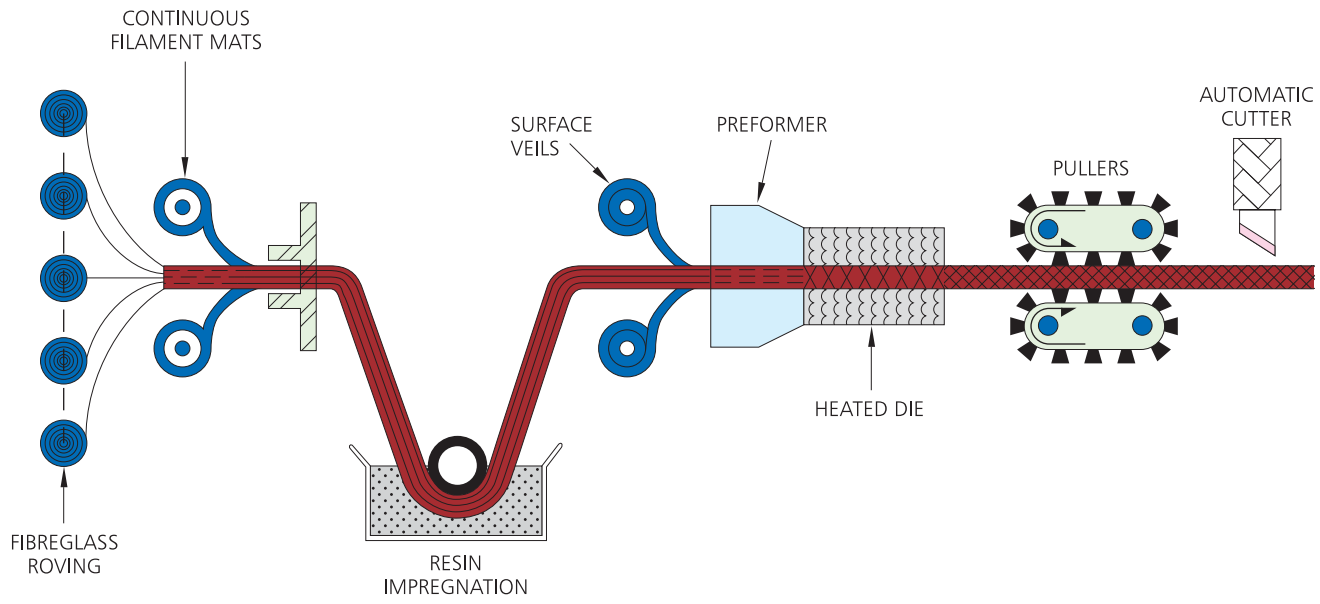
This continuous process gives added resistance to the tension, compression and flexibility of its products. It also provides higher strength resulting in a reinforced structure system that is capable of taking high loads.
(For details, please refer to the safe working load graph).

Benefits of Pultrusion FRP Products

- **Corrosion Resistant**
  - No rusting, peeling or flaking even under the most aggressive conditions in any part of the world.
- **Lightweight and Durable**
  - Allows easy handling and cutting.
  - Reduces size of platform structure.
- **Cost Effective**
  - Extremely long life compared to metal and other plastic materials.
  - Completely maintenance-free.
- **High Strength and Stiffness**
  - High glass content and continuous reinforcement, pultruded FRP products give extremely high strength and stiffness compared to molded FRP and other engineering plastic.
- **High Impact Resistant & Elastic**
  - Returns to original position without any permanent deflection or distortion within recommended allowable loads.
- **Superior UV Protection**
  - INTECH's integral UV protection system gives long-term shield against the damaging effects of UV rays.
- **Non-Conductive & Non-Interfering**
  - Complies to international electrical safety specifications.
  - Allows transmission of radio waves.
  - Non-magnetic.
- **Low Thermal Conductivity & Expansion Rate**
  - Will not transfer heat unlike metal.
  - No problem of expansion under heat.
- **Fire Retardant**
  - Complies to ASTM-E84 and BS 476 standards.

FRP Pultrusion Process

CONTINUOUS PULTRUSION



Roving & Mat
Unidirectional glass roving fibres give longitudinal reinforcement of the profile while mats give transverse strength

Resin
Bonds with the reinforcement, and provide resistance to chemicals.

Heated Die
Where polymerisation or curing takes place and product forms into the shape of the profile.

Pullers
Assures continuous drawing of the profile.

Automatic Cutter
Cuts product to the pre-set length.

PULTRUSION PROCESS

Pultrusion is a continuous moulding process fabricating products of uniform cross section such as I Beams, Channels, Flat Bars, Rods, Hollow Sections, etc. utilising glass fibre, resin, filler, peroxide and a release agent. The glass reinforcement is drawn into a resin impregnation zone where the glass substrate is thoroughly impregnated with the resin mixture. The wet fibrous material will be pulled through a preformer into a heated die. The shape of the end product is determined by the configuration of the die and the resin is then polymerised. This continuous and uniform method ensures consistency throughout the entire product length, therefore eliminating the possibility of weak spots.

Standards and Certification

ARGOS FRP's dedication towards excellent quality is reflected in all its FRP products that have been tested to comply with major international standards such as the ASTM, BS, NEMA and UL. The company's focus has always been to provide products and services that not only meet customers' requirements but also exceed their expectations, both locally and around the world.

Certification that stand as testimony of this commitment over the years include those conducted by following independent testing inspection organisation:

ARGOS FRP's Manufacturing partner for Cable Ladders & Trays is Intralink Techno Sdn Bhd (Intech) based at Malaysia.


Plastics Technology Group
Advanced Polymer & Composites Programme
SIRIM Berhad
EVALUATION REPORT

- SIRIM
- SGS
- ABS
- Lloyds
- PSB


SGS
CERTIFICATE OF INSPECTION

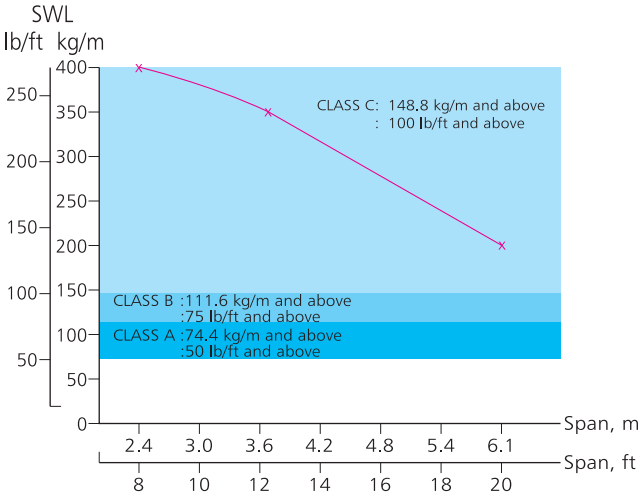

ABS
TYPE APPROVAL PROGRAM
Confirmation of Product Type Approval 31/MAR/2009
INTRALINK TECHNO SDN BHD
Model Name(s): "INTECH" Cable Ladder


LRQA
CERTIFICATE OF APPROVAL
Intralink Techno Sdn. Bhd. (495364-M)
Semeryih, Selangor
Malaysia
ISO 9001:2008
MS ISO 9001:2008
Design and manufacture of advanced composite materials such as fibreglass reinforced composite products.

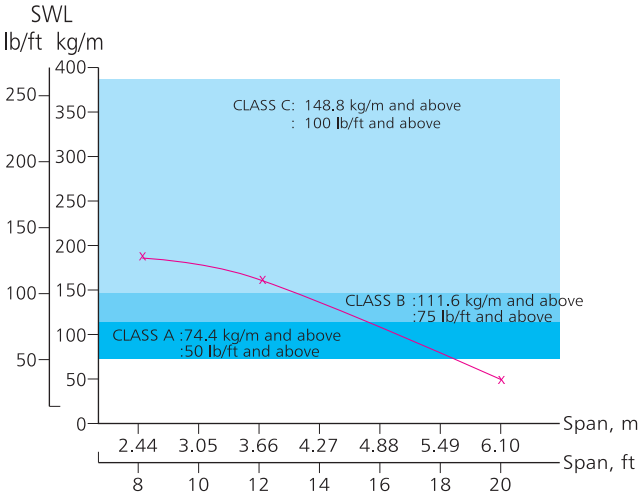

TEST REPORT
PSB Corporation
SUBJECT:
TESTED FOR:
DATE OF TEST:
PURPOSE OF TEST:

Safe Working Load-Cable Ladder

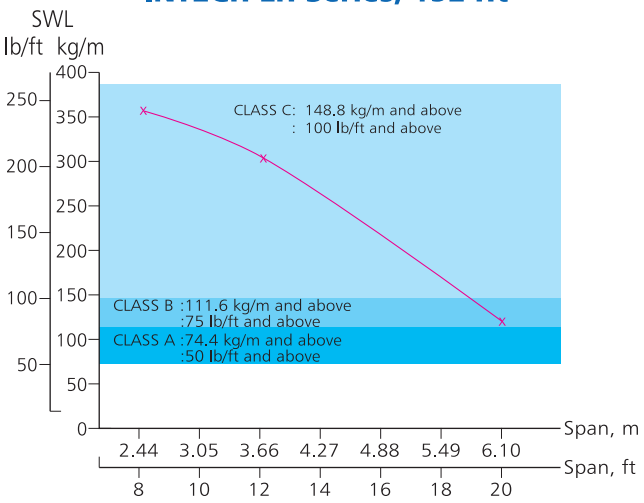
FRP Cable Ladder Load Test INTECH LSH Series, 152 Ht



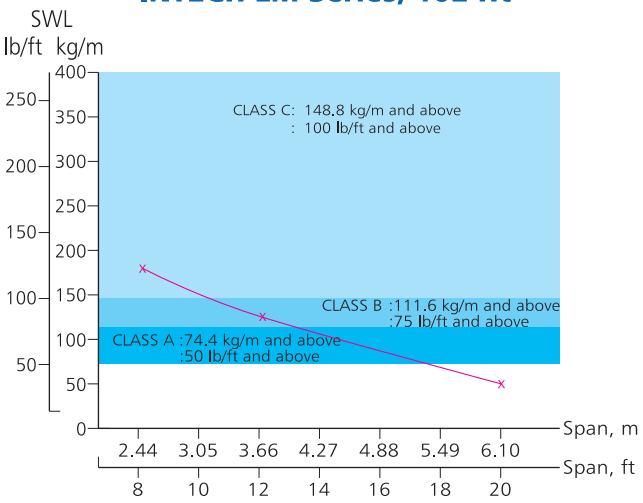
FRP Cable Ladder Load Test INTECH LMH Series, 152 Ht



FRP Cable Ladder Load Test INTECH LH Series, 152 Ht



FRP Cable Ladder Load Test INTECH LM Series, 102 Ht



INTECH FRP Cable Ladder Classification (NEMA FG1)

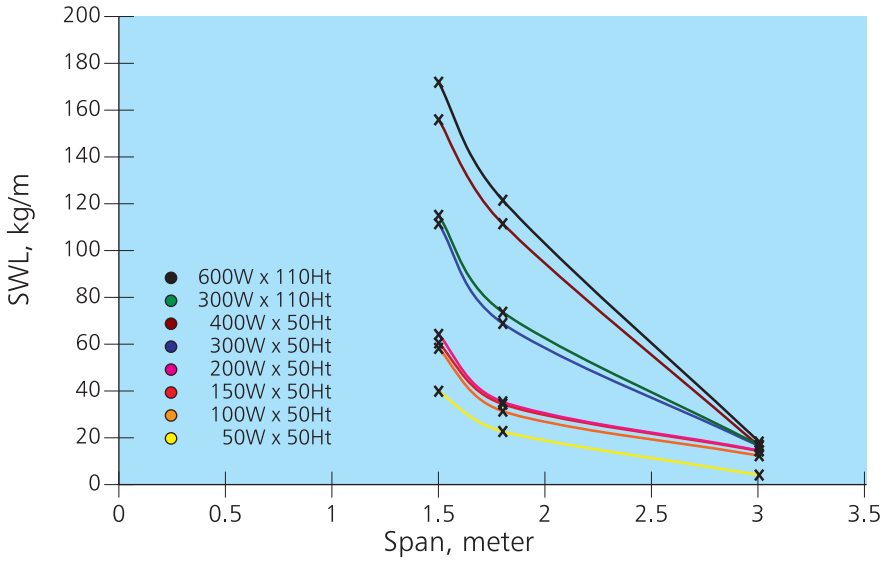
		Span, ft	Class	Classification			Span, ft	Class	Classification
1	LSH Series 152 Ht,	8 12 16 20	8C 12C 16C 20C	*NEMA FG1 20C	3	LMH Series 152 Ht,	8 12 16	8C 12C 16A	*NEMA FG1 12C
2	LH Series 152 Ht,	8 12 16 20	8C 12C 16C 20B	*NEMA FG1 20B	4	LM Series 102 Ht,	8 12 16	8C 12B 16A	*NEMA FG1 12B

***Other range available upon request**

***SWL determined from load test in accordance with item 4.1 of NEMA FG1 with Safety Factor of 1.5.**

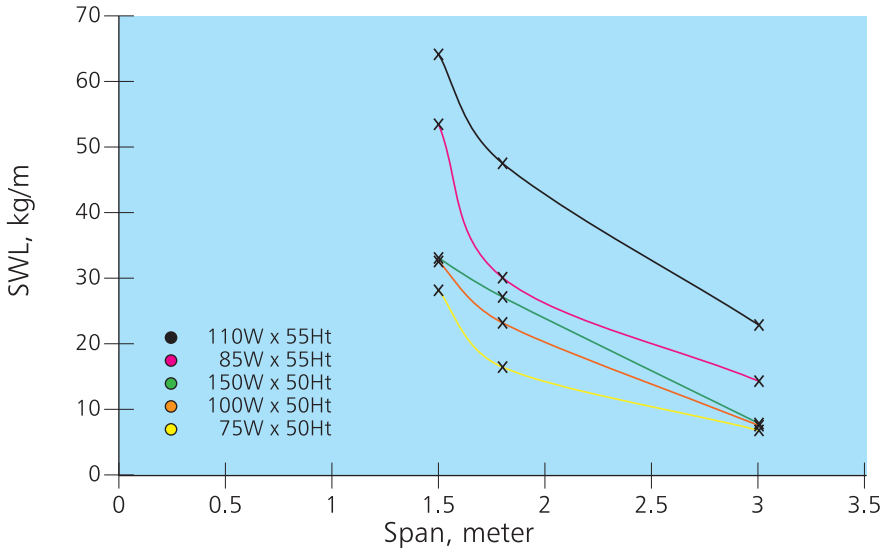
Safe Working Load-Cable Tray

INTECH C Type Cable Tray, 50Ht & 110Ht



INTECH C Type Cable Tray, 50Ht & 110Ht			
Thk, mm	Width, mm	Height.mm	Safe Working Load for Span 1500, kg/m
3	50	50	39.5
3	100	50	57.9
3	150	50	60.2
3	200	50	63.8
3	300	50	111.1
4	400	50	155.6
3	300	110	114.7
3	600	110	171.5

INTECH U Type Cable Tray, 50Ht & 55Ht



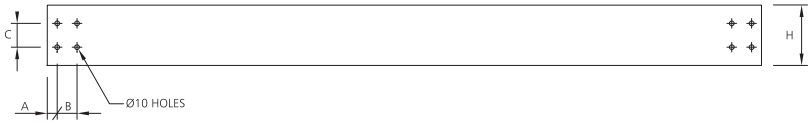
INTECH U Type Cable Tray, 50Ht & 55Ht			
Thk, mm	Width, mm	Height,mm	Safe Working Load for Span 1500, kg/m
3	75	50	28.5
3	100	50	32.4
3	150	50	33.0
5	85	55	53.3
5	110	55	64.0

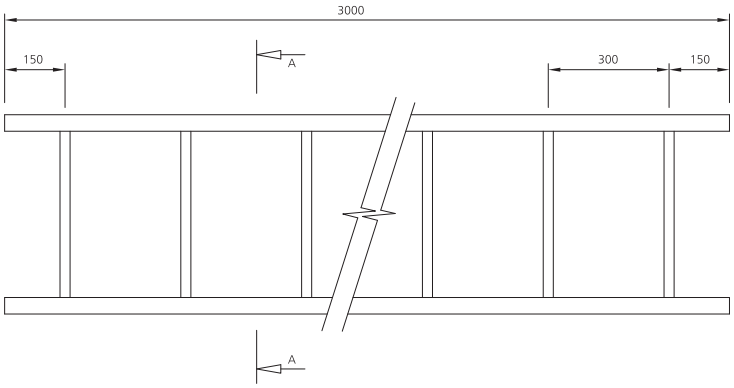
***SWL determined from load test in accordance with item 4.1 of NEMA FG1 with Safety Factor of 1.5.**

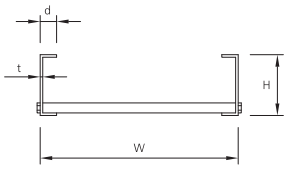
***Other range available upon request**

Cable Ladder - LH Series

LH Series-Straight Run

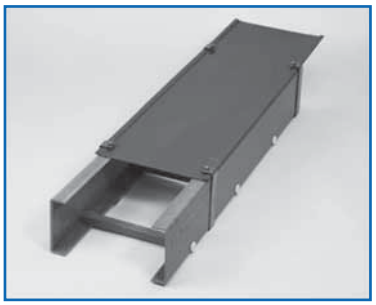




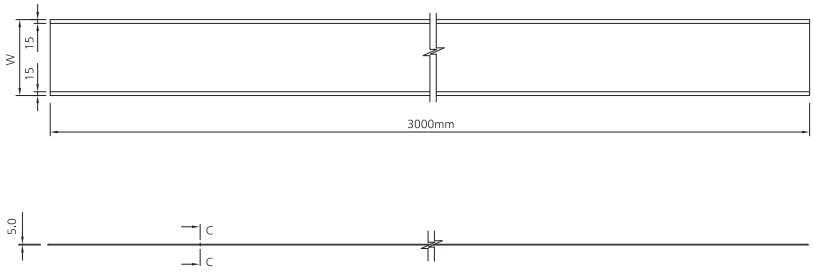


SECTION A-A

TYPE	H	d	t	A	B	C	REMARKS
LH	152	41	6.0	24	50	60	W=150, 300, 450, 600, 750, 900

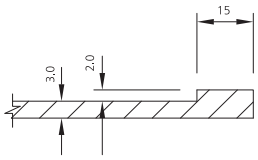


LH Series-Cover

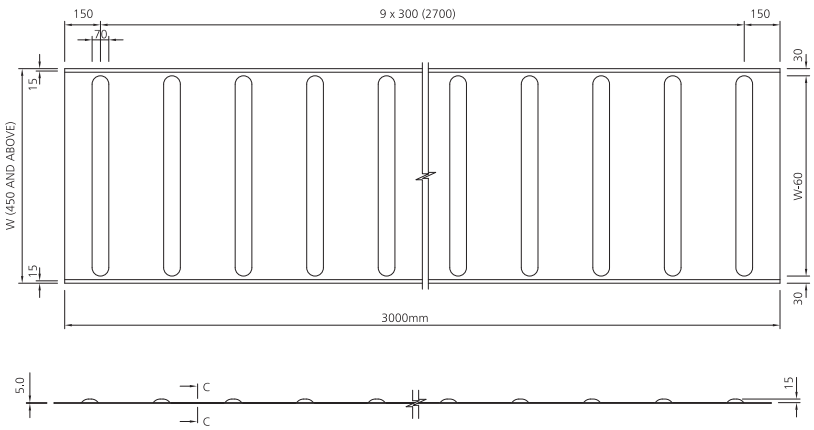


W=150, 300

FLAT COVER



SECTION C-C

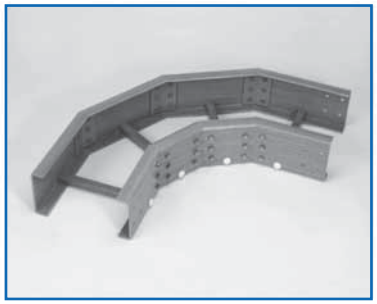


W=450, 600, 750, 900

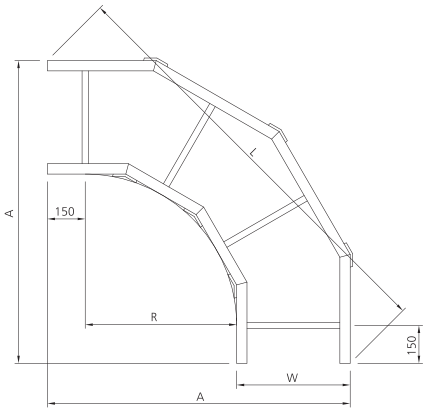
FRP RIBBED COVER FOR CABLE LADDER

* Thickness of FRP side rail for LH Series is 6mm unless otherwise specified.

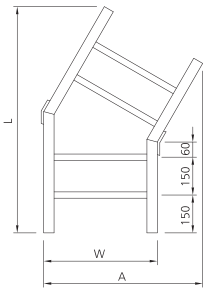
Cable Ladder - LH Series



LH Series-Horizontal Bend



90° HORIZONTAL BEND
(90° HB)

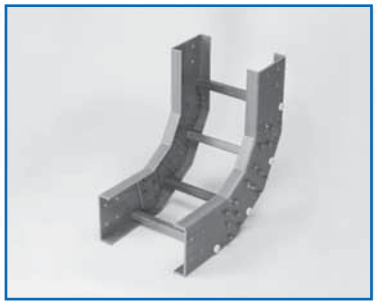


30°/45° HORIZONTAL BEND
(30°/45° HB)

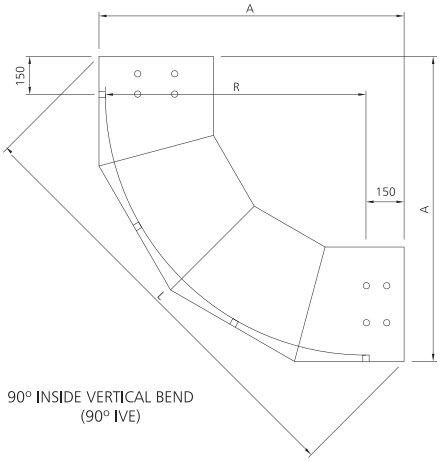
90° HB		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LH 90 HB 150	150	600	849	900	1273	1200	1697
LH 90 HB 300	300	750	1061	1050	1485	1350	1909
LH 90 HB 450	450	900	1273	1200	1697	1500	2121
LH 90 HB 600	600	1050	1485	1350	1909	1650	2333
LH 90 HB 750	750	1200	1697	1500	2121	1800	2546
LH 90 HB 900	900	1350	1909	1650	2333	1950	2758

45° HORIZONTAL BEND			
REF NO	W	A	L
LH 45 HB 150	150	405	721
LH 45 HB 300	300	555	827
LH 45 HB 450	450	705	933
LH 45 HB 600	600	855	1039
LH 45 HB 750	750	1005	1145
LH 45 HB 900	900	1155	1251

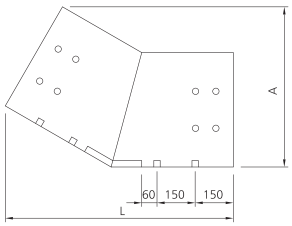
30° HORIZONTAL BEND			
REF NO	W	A	L
LH 30 HB 150	150	320	747
LH 30 HB 300	300	480	822
LH 30 HB 450	450	630	897
LH 30 HB 600	600	780	972
LH 30 HB 750	750	930	1047
LH 30 HB 900	900	1080	1122



LH Series-Inside Vertical Bend



90° INSIDE VERTICAL BEND
(90° IVE)



45°/30° INSIDE VERTICAL BEND
(45°/30° IVE)

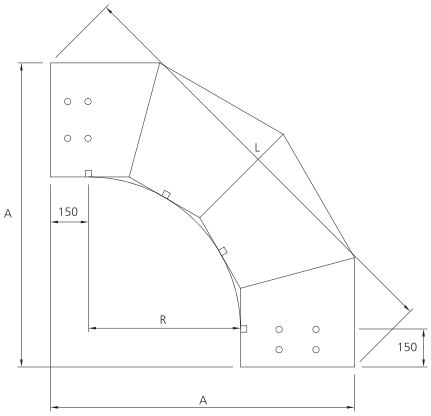
90° IVE		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LH 90 IVE 150	150	482	682	782	1106	1082	1530
LH 90 IVE 300	300	482	682	782	1106	1082	1530
LH 90 IVE 450	450	482	682	782	1106	1082	1530
LH 90 IVE 600	600	482	682	782	1106	1082	1530
LH 90 IVE 750	750	482	682	782	1106	1082	1530
LH 90 IVE 900	900	482	682	782	1106	1082	1530

45° INSIDE VERTICAL BEND			
REF NO	W	A	L
LH 45 IVE 150	150	299	722
LH 45 IVE 300	300	299	722
LH 45 IVE 450	450	299	722
LH 45 IVE 600	600	299	722
LH 45 IVE 750	750	299	722
LH 45 IVE 900	900	299	722

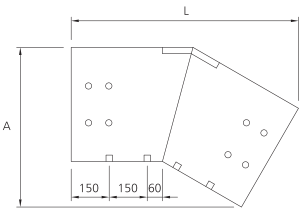
30° INSIDE VERTICAL BEND			
REF NO	W	A	L
LH 30 IVE 150	150	200	748
LH 30 IVE 300	300	200	748
LH 30 IVE 450	450	200	748
LH 30 IVE 600	600	200	748
LH 30 IVE 750	750	200	748
LH 30 IVE 900	900	200	748

Cable Ladder - LH Series

LH Series-Outside Vertical Bend



90° OUTSIDE VERTICAL BEND
(90° OVE)



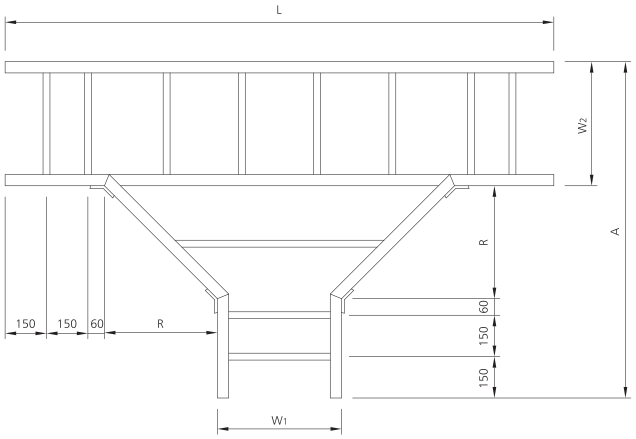
30°/45° OUTSIDE VERTICAL BEND
(30°/45° OVE)

90° OVE		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LH 90 OVE 150	150	602	851	902	1276	1202	1700
LH 90 OVE 300	300	602	851	902	1276	1202	1700
LH 90 OVE 450	450	602	851	902	1276	1202	1700
LH 90 OVE 600	600	602	851	902	1276	1202	1700
LH 90 OVE 750	750	602	851	902	1276	1202	1700
LH 90 OVE 900	900	602	851	902	1276	1202	1700

45° OUTSIDE VERTICAL BEND			
REF NO	W	A	L
LH 45 OVE 150	150	407	722
LH 45 OVE 300	300	407	722
LH 45 OVE 450	450	407	722
LH 45 OVE 600	600	407	722
LH 45 OVE 750	750	407	722
LH 45 OVE 900	900	407	722

30° OUTSIDE VERTICAL BEND			
REF NO	W	A	L
LH 30 OVE 150	150	332	748
LH 30 OVE 300	300	332	748
LH 30 OVE 450	450	332	748
LH 30 OVE 600	600	332	748
LH 30 OVE 750	750	332	748
LH 30 OVE 900	900	332	748

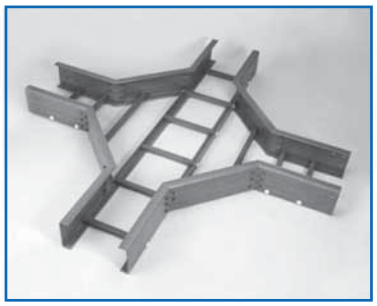
LH Series-Horizontal Tee



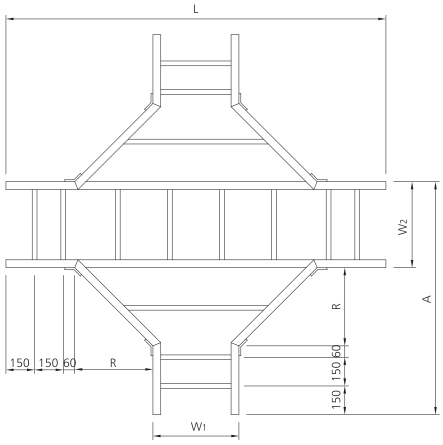
HORIZONTAL EQUAL TEE
(HT)

90° HT		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LHHT 150	150	810	1470	1110	2070	1410	2670
LHHT 300	300	960	1620	1260	2220	1560	2920
LHHT 450	450	1110	1770	1410	2370	1710	2970
LHHT 600	600	1260	1920	1560	2520	1860	3120
LHHT 750	750	1410	2070	1710	2670	2010	3270
LHHT 900	900	1560	2220	1860	2820	2160	3420

Cable Ladder - LH Series

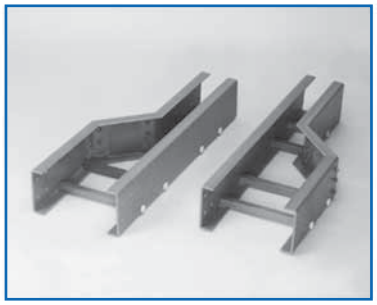


LH Series-Horizontal Cross

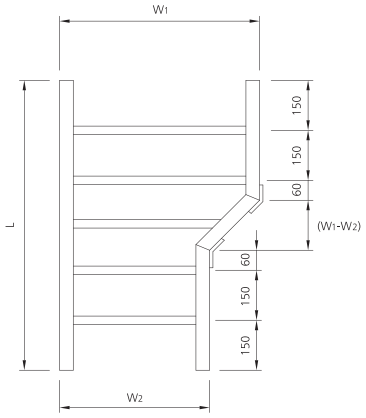


HORIZONTAL EQUAL CROSS
(HC)

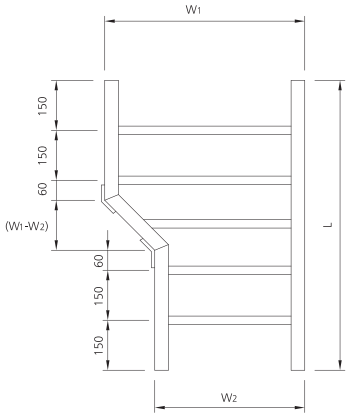
90° HC		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LHHC 150	150	1470	1470	2070	2070	2670	2670
LHHC 300	300	1620	1620	2220	2220	2920	2920
LHHC 450	450	1770	1770	2370	2370	2970	2970
LHHC 600	600	1920	1920	2520	2520	3120	3120
LHHC 750	750	2070	2070	2670	2670	3270	3270
LHHC 900	900	2220	2220	2820	2820	3420	3420



LH Series-Left/Right
Hand Reducer



RIGHT HAND REDUCER
(RHR)

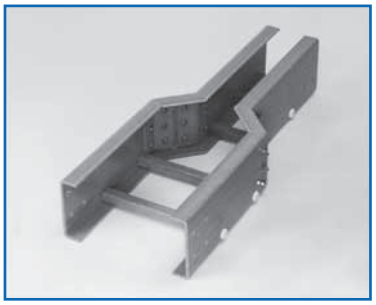


LEFT HAND REDUCER
(LHR)

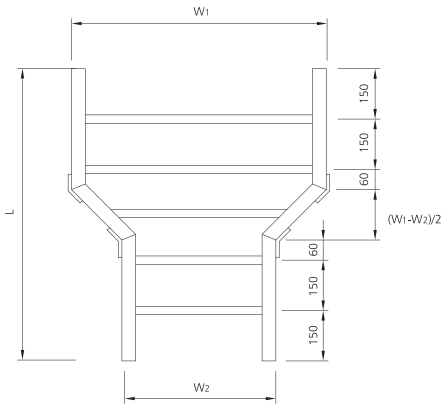
RHR AND LHR			
REF NO	W1	W2	L
LH RHR (LHR) 900-750	900	750	870
LH RHR (LHR) 900-600	900	600	1020
LH RHR (LHR) 900-450	900	450	1170
LH RHR (LHR) 900-300	900	300	1320
LH RHR (LHR) 900-150	900	150	1470
LH RHR (LHR) 750-600	750	600	870
LH RHR (LHR) 750-450	750	450	1020
LH RHR (LHR) 750-300	750	300	1170

RHR AND LHR			
REF NO	W1	W2	L
LH RHR (LHR) 750-150	750	150	1320
LH RHR (LHR) 600-450	600	450	870
LH RHR (LHR) 600-300	600	300	1020
LH RHR (LHR) 600-150	600	150	1170
LH RHR (LHR) 450-300	450	300	870
LH RHR (LHR) 450-150	450	150	1020
LH RHR (LHR) 300-150	300	150	870

Cable Ladder - LH Series

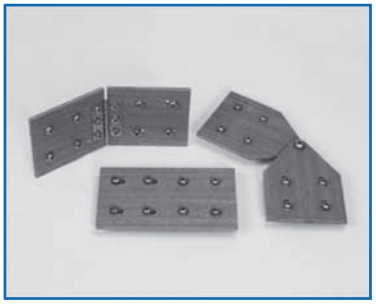


LH Series-Straight Reducer

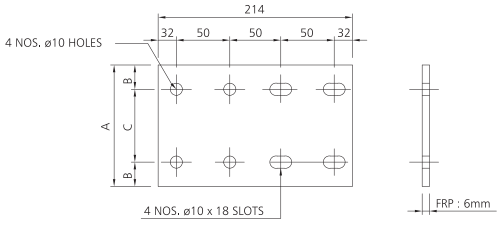


STRAIGHT REDUCER
(SR)

STRAIGHT REDUCER (SR)			
REF NO	W1	W2	L
LH SR 900-750	900	750	795
LH SR 900-600	900	600	870
LH SR 900-450	900	450	945
LH SR 900-300	900	300	1020
LH SR 900-150	900	150	1095
LH SR 750-600	750	600	795
LH SR 750-450	750	450	870
LH SR 750-300	750	300	945
LH SR 750-150	750	150	1070
LH SR 600-450	600	450	795
LH SR 600-300	600	300	870
LH SR 600-150	600	150	945
LH SR 450-300	450	300	795
LH SR 450-150	450	150	870
LH SR 300-150	300	150	795

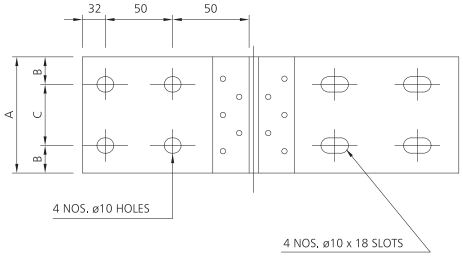


LH Series-Splice Plate

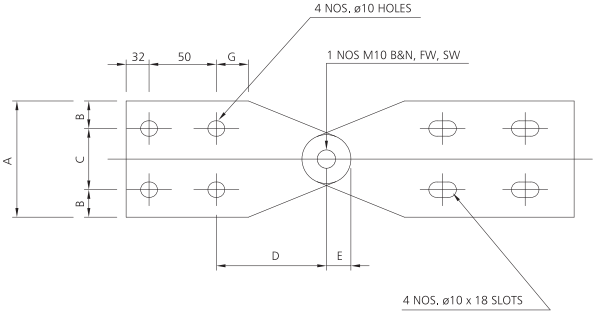


LH-EXPANSION SPLICE PLATE (ESP)

LH-ESP DIMENSIONS			
LADDER TYPE	A	B	C
LH	125	32.5	60



HORIZONTAL ADJUSTABLE SPLICE PLATE
(HESP)



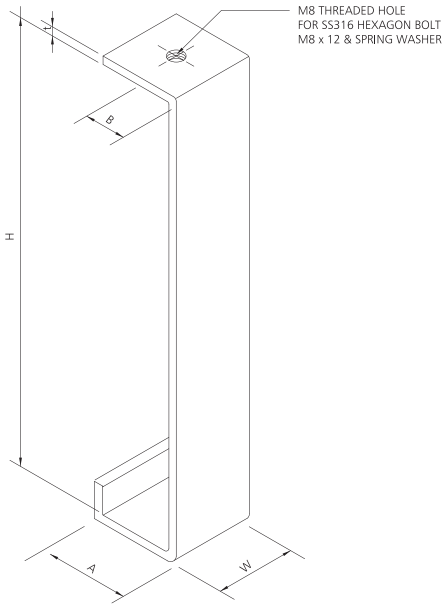
VERTICAL ADJUSTABLE SPLICE PLATE
(VESP)

LH-HESP DIMENSIONS			
LADDER TYPE	A	B	C
LH	125	32.5	60

LH-VESP DIMENSIONS						
LADDER TYPE	A	B	C	D	E	F
LH	125	32.5	60	75	16	15

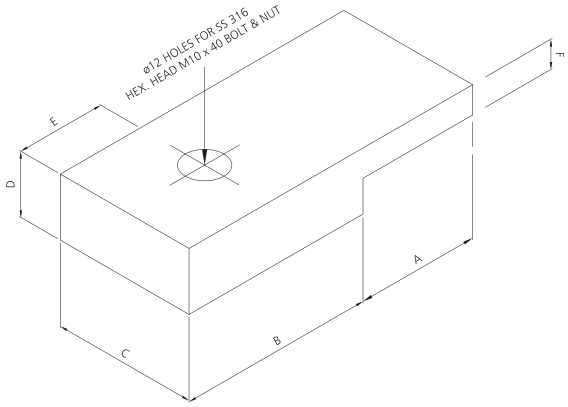
Cable Ladder - LH Series

LH Series-Cover Clamp-SS316 (CC-SS)



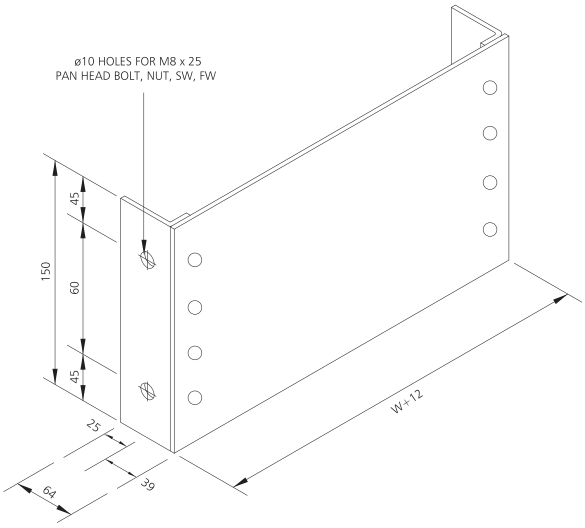
CC-SS					
LADDER TYPE	H	W	t	A	B
LH	160	30	2.0	48	24

LH Series-Hold Down Clamp (HDC)

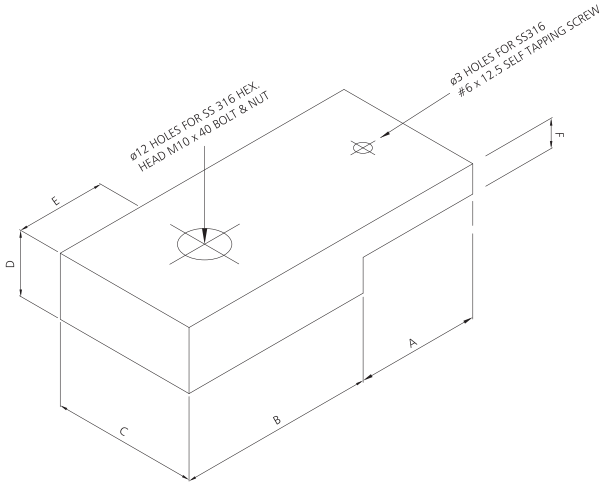


HDC						
LADDER TYPE	A	B	C	D	E	F
LH	27	40	40	12.2	25	6

LH Series-Blind End Plate (BEP)

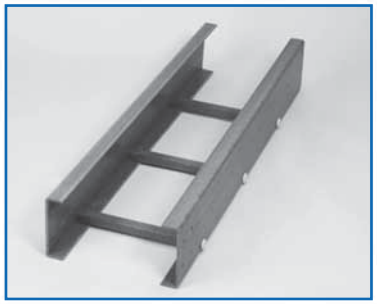


LH Series-Vertical Fixing Clamp (VFC)

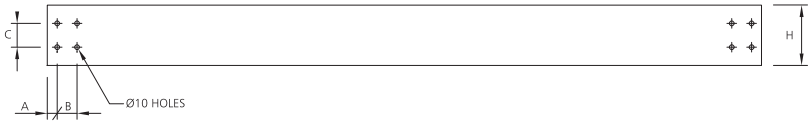


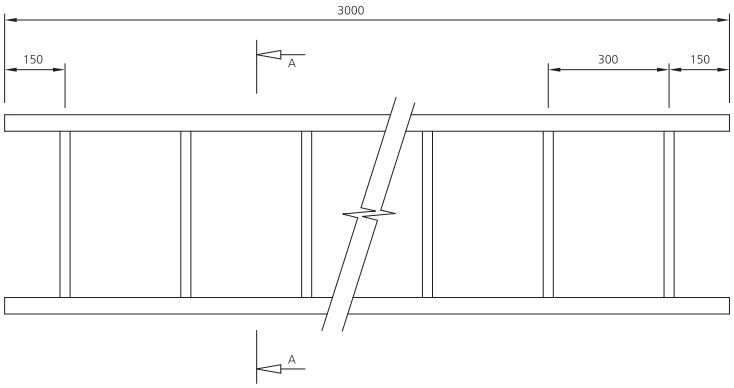
VFC						
LADDER TYPE	A	B	C	D	E	F
LH	27	40	40	12.2	25	6

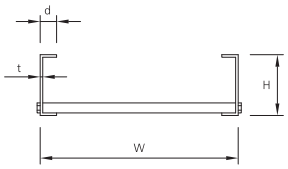
Cable Ladder - LMH Series



LMH Series-Straight Run

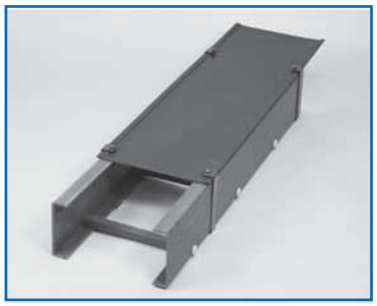




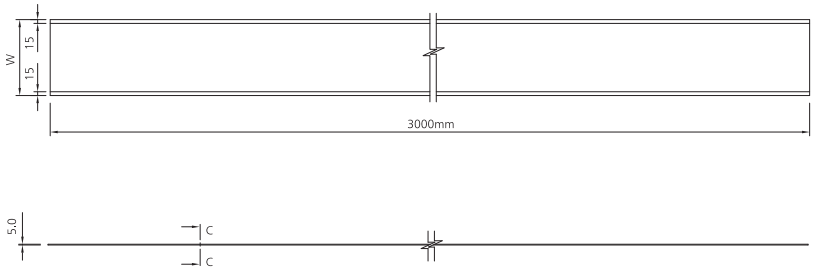


SECTION A-A

TYPE	H	d	t	A	B	C	REMARKS
LMH	152	41	4.5	24	50	60	W=150, 300, 450, 600, 750, 900

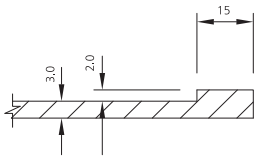


LMH Series-Cover

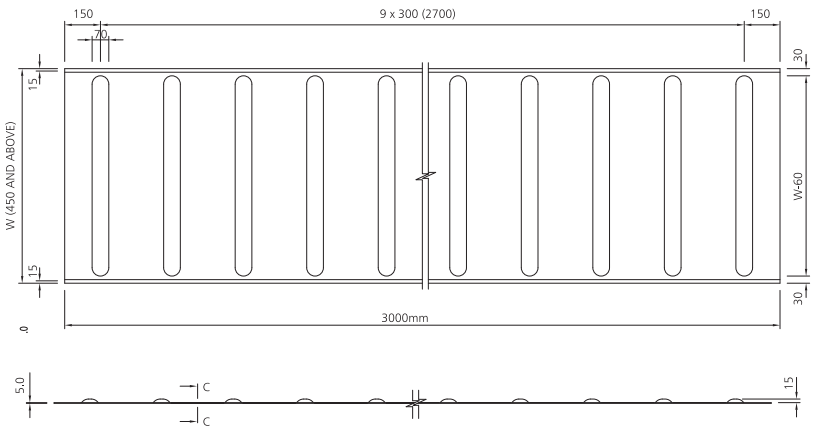


W=150, 300

FLAT COVER



SECTION C-C

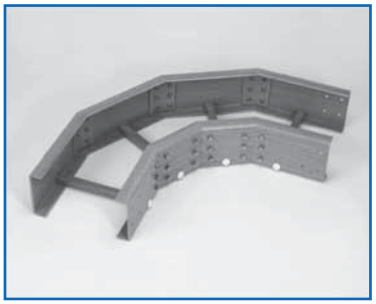


W=450, 600, 750, 900

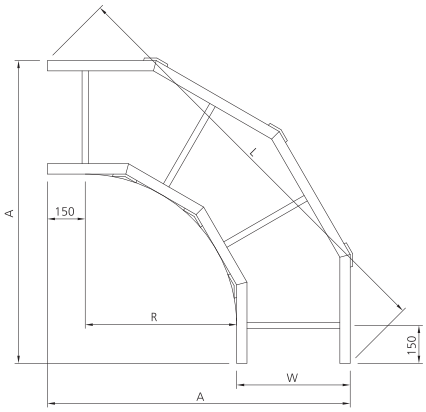
FRP RIBBED COVER FOR CABLE LADDER

* Thickness of FRP side rail for LMH Series is 4.5mm unless otherwise specified.

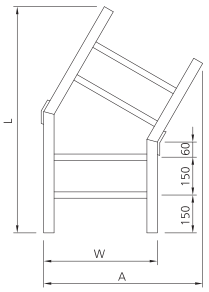
Cable Ladder - LMH Series



LMH Series-Horizontal Bend



90° HORIZONTAL BEND
(90° HB)

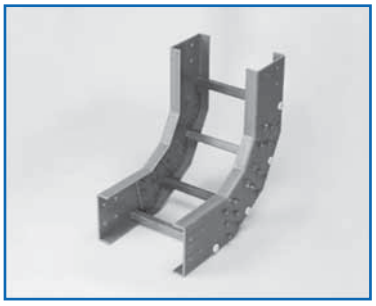


30°/45° HORIZONTAL BEND
(30°/45° HB)

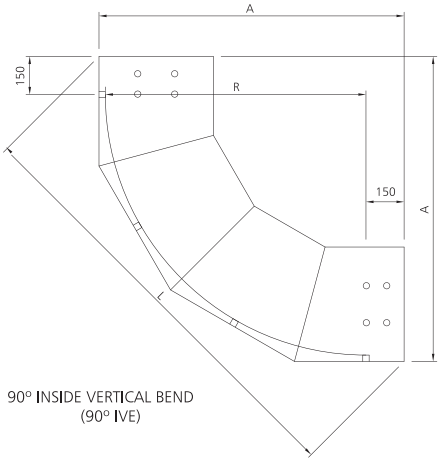
90° HB		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMH 90 HB 150	150	600	849	900	1273	1200	1697
LMH 90 HB 300	300	750	1061	1050	1485	1350	1909
LMH 90 HB 450	450	900	1273	1200	1697	1500	2121
LMH 90 HB 600	600	1050	1485	1350	1909	1650	2333
LMH 90 HB 750	750	1200	1697	1500	2121	1800	2546
LMH 90 HB 900	900	1350	1909	1650	2333	1950	2758

45° HORIZONTAL BEND			
REF NO	W	A	L
LMH 45 HB 150	150	405	721
LMH 45 HB 300	300	555	827
LMH 45 HB 450	450	705	933
LMH 45 HB 600	600	855	1039
LMH 45 HB 750	750	1005	1145
LMH 45 HB 900	900	1155	1251

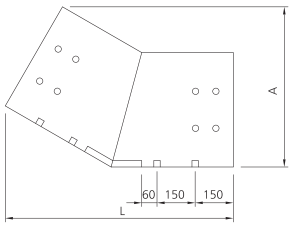
30° HORIZONTAL BEND			
REF NO	W	A	L
LMH 30 HB 150	150	320	747
LMH 30 HB 300	300	480	822
LMH 30 HB 450	450	630	897
LMH 30 HB 600	600	780	972
LMH 30 HB 750	750	930	1047
LMH 30 HB 900	900	1080	1122



LMH Series-Inside Vertical Bend



90° INSIDE VERTICAL BEND
(90° IVE)



45°/30° INSIDE VERTICAL BEND
(45°/30° IVE)

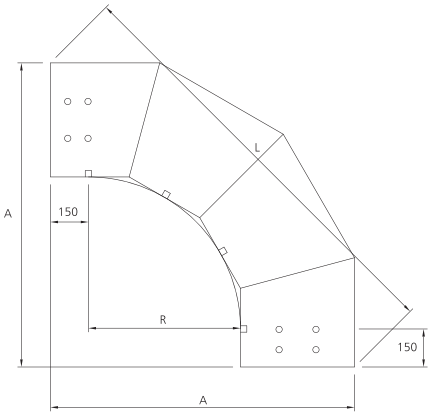
90° IVE		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMH 90 IVE 150	150	482	682	782	1106	1082	1530
LMH 90 IVE 300	300	482	682	782	1106	1082	1530
LMH 90 IVE 450	450	482	682	782	1106	1082	1530
LMH 90 IVE 600	600	482	682	782	1106	1082	1530
LMH 90 IVE 750	750	482	682	782	1106	1082	1530
LMH 90 IVE 900	900	482	682	782	1106	1082	1530

45° INSIDE VERTICAL BEND			
REF NO	W	A	L
LMH 45 IVE 150	150	299	722
LMH 45 IVE 300	300	299	722
LMH 45 IVE 450	450	299	722
LMH 45 IVE 600	600	299	722
LMH 45 IVE 750	750	299	722
LMH 45 IVE 900	900	299	722

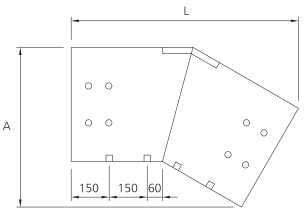
30° INSIDE VERTICAL BEND			
REF NO	W	A	L
LMH 30 IVE 150	150	200	748
LMH 30 IVE 300	300	200	748
LMH 30 IVE 450	450	200	748
LMH 30 IVE 600	600	200	748
LMH 30 IVE 750	750	200	748
LMH 30 IVE 900	900	200	748

Cable Ladder - LMH Series

LMH Series-Outside Vertical Bend



90° OUTSIDE VERTICAL BEND
(90° OVE)

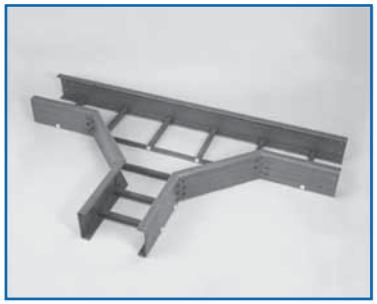


30°/45° OUTSIDE VERTICAL BEND
(30°/45° OVE)

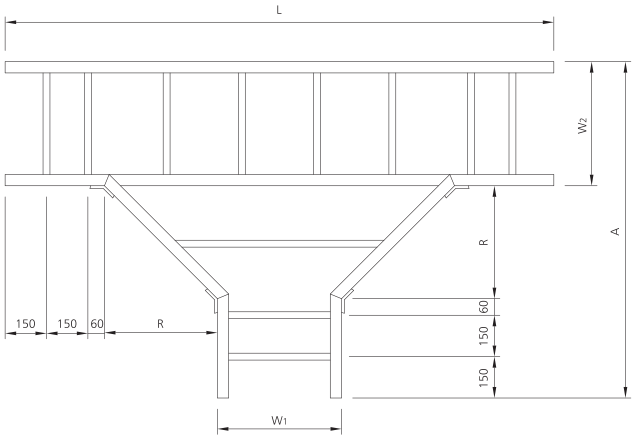
90° OVE		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMH 90 OVE 150	150	602	851	902	1276	1202	1700
LMH 90 OVE 300	300	602	851	902	1276	1202	1700
LMH 90 OVE 450	450	602	851	902	1276	1202	1700
LMH 90 OVE 600	600	602	851	902	1276	1202	1700
LMH 90 OVE 750	750	602	851	902	1276	1202	1700
LMH 90 OVE 900	900	602	851	902	1276	1202	1700

45° OUTSIDE VERTICAL BEND			
REF NO	W	A	L
LMH 45 OVE 150	150	407	722
LMH 45 OVE 300	300	407	722
LMH 45 OVE 450	450	407	722
LMH 45 OVE 600	600	407	722
LMH 45 OVE 750	750	407	722
LMH 45 OVE 900	900	407	722

30° OUTSIDE VERTICAL BEND			
REF NO	W	A	L
LMH 30 OVE 150	150	332	748
LMH 30 OVE 300	300	332	748
LMH 30 OVE 450	450	332	748
LMH 30 OVE 600	600	332	748
LMH 30 OVE 750	750	332	748
LMH 30 OVE 900	900	332	748



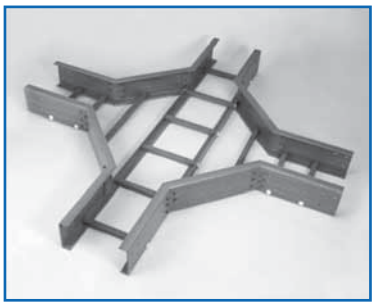
LMH Series-Horizontal Tee



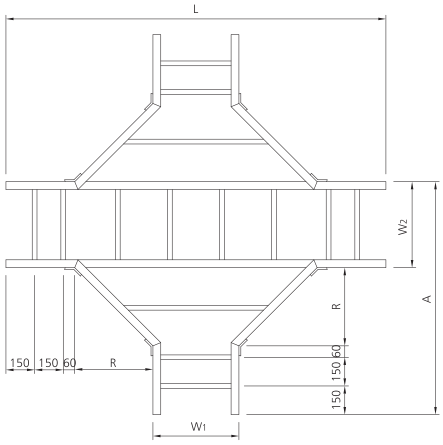
HORIZONTAL EQUAL TEE
(HT)

90° HT		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMHHT 150	150	810	1470	1110	2070	1410	2670
LMHHT 300	300	960	1620	1260	2220	1560	2920
LMHHT 450	450	1110	1770	1410	2370	1710	2970
LMHHT 600	600	1260	1920	1560	2520	1860	3120
LMHHT 750	750	1410	2070	1710	2670	2010	3270
LMHHT 900	900	1560	2220	1860	2820	2160	3420

Cable Ladder - LMH Series

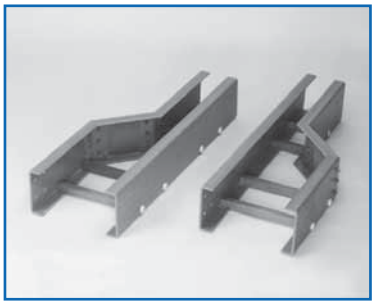


LMH Series-Horizontal Cross

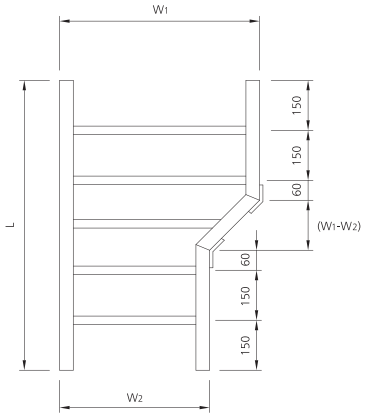


HORIZONTAL EQUAL CROSS
(HC)

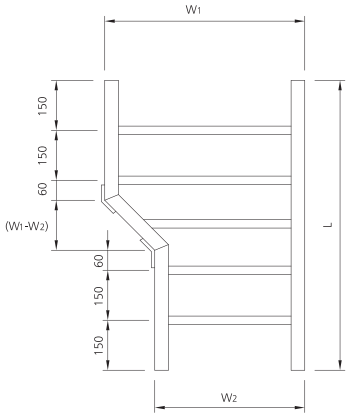
90° HC		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMH 150	150	1470	1470	2070	2070	2670	2670
LMH 300	300	1620	1620	2220	2220	2920	2920
LMH 450	450	1770	1770	2370	2370	2970	2970
LMH 600	600	1920	1920	2520	2520	3120	3120
LMH 750	750	2070	2070	2670	2670	3270	3270
LMH 900	900	2220	2220	2820	2820	3420	3420



LMH Series-Left/Right
Hand Reducer



RIGHT HAND REDUCER
(RHR)

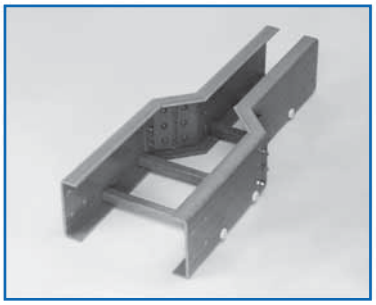


LEFT HAND REDUCER
(LHR)

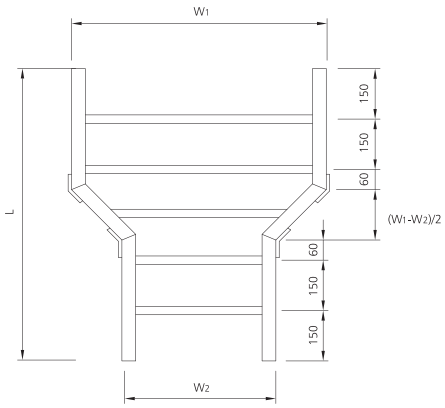
RHR AND LHR			
REF NO	W1	W2	L
LMH RHR (LHR) 900-750	900	750	870
LMH RHR (LHR) 900-600	900	600	1020
LMH RHR (LHR) 900-450	900	450	1170
LMH RHR (LHR) 900-300	900	300	1320
LMH RHR (LHR) 900-150	900	150	1470
LMH RHR (LHR) 750-600	750	600	870
LMH RHR (LHR) 750-450	750	450	1020
LMH RHR (LHR) 750-300	750	300	1170

RHR AND LHR			
REF NO	W1	W2	L
LMH RHR (LHR) 750-150	750	150	1320
LMH RHR (LHR) 600-450	600	450	870
LMH RHR (LHR) 600-300	600	300	1020
LMH RHR (LHR) 600-150	600	150	1170
LMH RHR (LHR) 450-300	450	300	870
LMH RHR (LHR) 450-150	450	150	1020
LMH RHR (LHR) 300-150	300	150	870

Cable Ladder - LMH Series

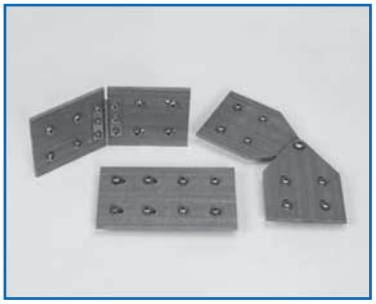


LMH Series-Straight Reducer

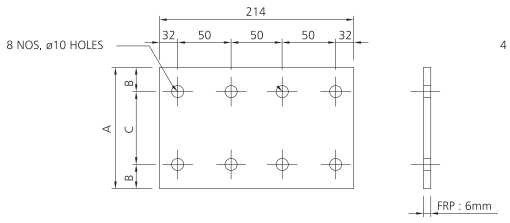


STRAIGHT REDUCER
(SR)

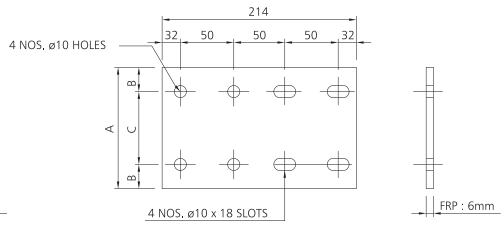
STRAIGHT REDUCER (SR)			
REF NO	W_1	W_2	L
LMH SR 900-750	900	750	795
LMH SR 900-600	900	600	870
LMH SR 900-450	900	450	945
LMH SR 900-300	900	300	1020
LMH SR 900-150	900	150	1095
LMH SR 750-600	750	600	795
LMH SR 750-450	750	450	870
LMH SR 750-300	750	300	945
LMH SR 750-150	750	150	1070
LMH SR 600-450	600	450	795
LMH SR 600-300	600	300	870
LMH SR 600-150	600	150	945
LMH SR 450-300	450	300	795
LMH SR 450-150	450	150	870
LMH SR 300-150	300	150	795



LMH Series-Splice Plate

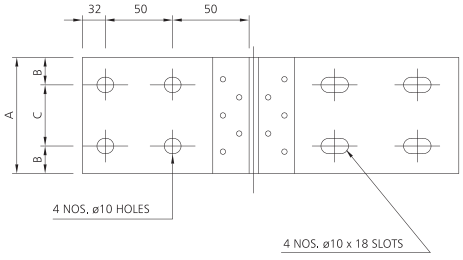


LMH-FIXED SPLICE PLATE (FSP)

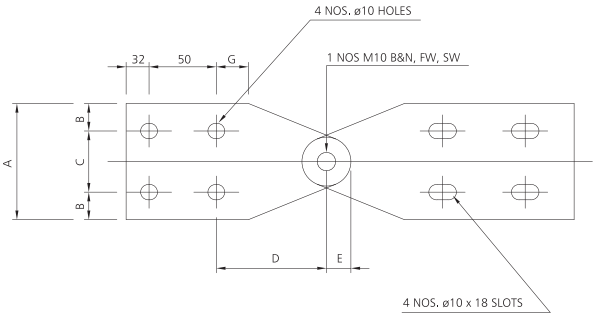


LMH-EXPANSION SPLICE PLATE (ESP)

LMH-FSP & ESP DIMENSIONS			
LADDER TYPE	A	B	C
LMH	125	32.5	60



HORIZONTAL ADJUSTABLE SPLICE PLATE
(HESP)



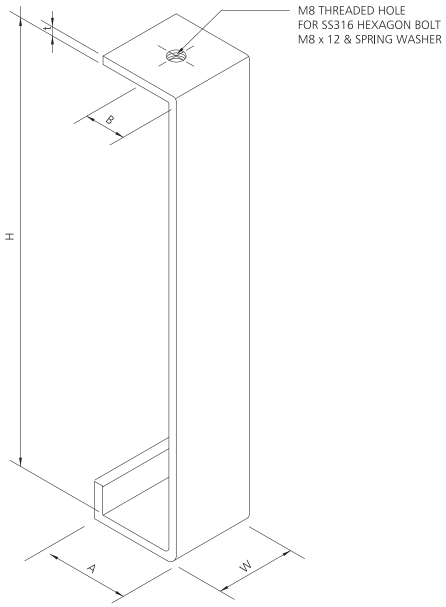
VERTICAL ADJUSTABLE SPLICE PLATE
(VESP)

LMH-HESP DIMENSIONS			
LADDER TYPE	A	B	C
LMH	125	32.5	60

LMH-VESP DIMENSIONS						
LADDER TYPE	A	B	C	D	E	F
LMH	125	32.5	60	75	16	15

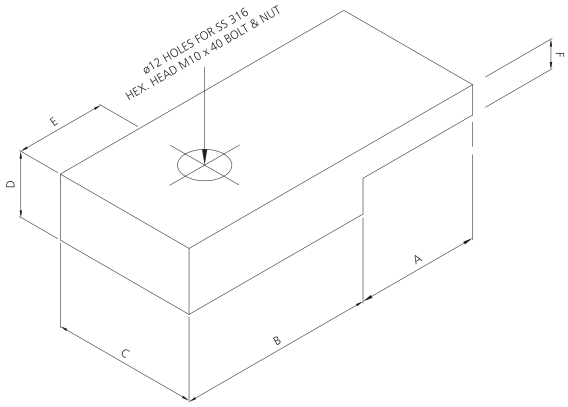
Cable Ladder - LMH Series

LMH Series-Cover Clamp-SS316 (CC-SS)



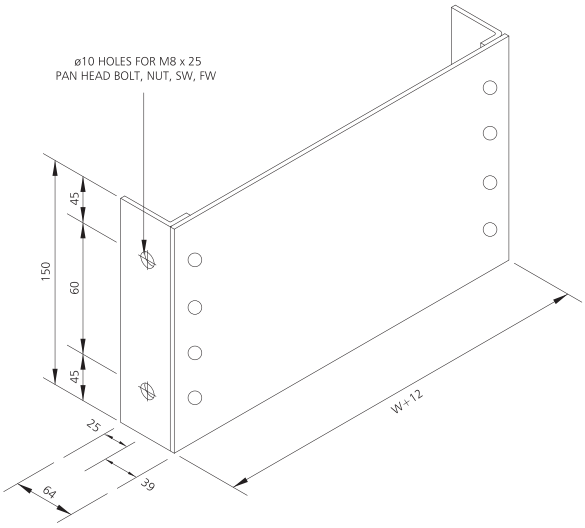
CC-SS					
LADDER TYPE	H	W	t	A	B
LMH	160	30	2.0	48	24

LMH Series-Hold Down Clamp (HDC)

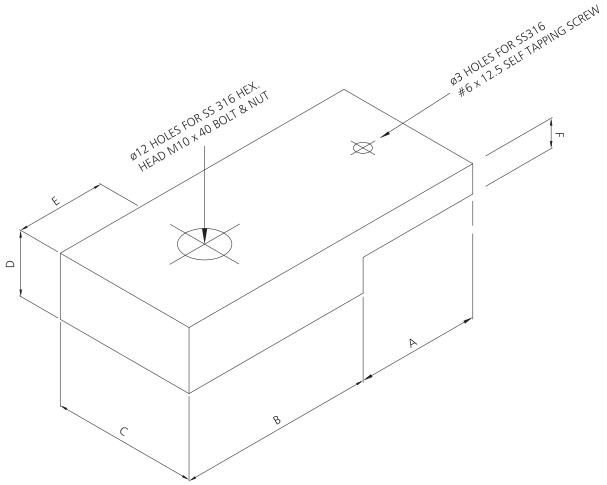


HDC						
LADDER TYPE	A	B	C	D	E	F
LMH	27	37	40	10.7	25	6

LMH Series-Blind End Plate (BEP)

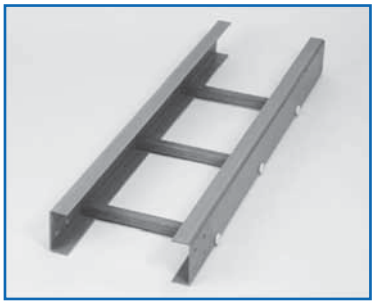


LMH Series-Vertical Fixing Clamp (VFC)

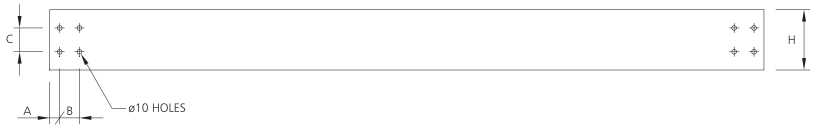


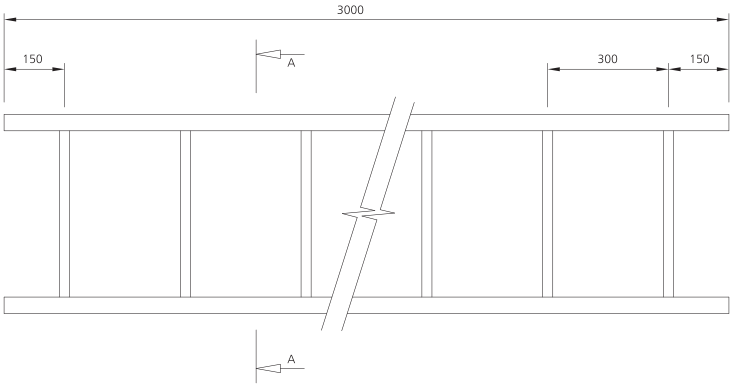
VFC						
LADDER TYPE	A	B	C	D	E	F
LMH	27	37	40	10.7	25	6

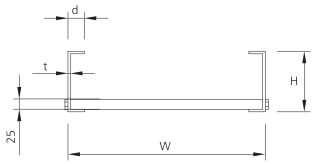
Cable Ladder - LM Series



LM Series-Straight Run

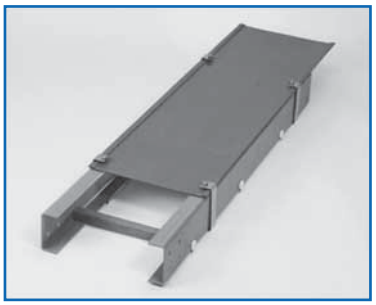




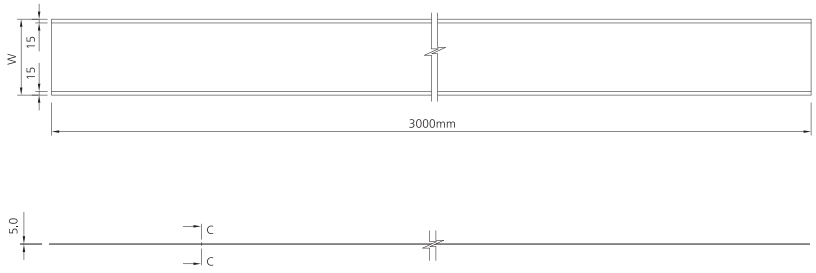


SECTION A-A

TYPE	H	d	t	A	B	C	REMARKS
LM	102	41	4.8	24	50	40	W=150, 300, 450, 600, 750, 900

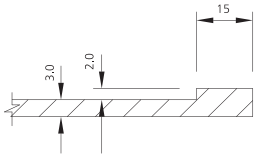


LM Series-Cover

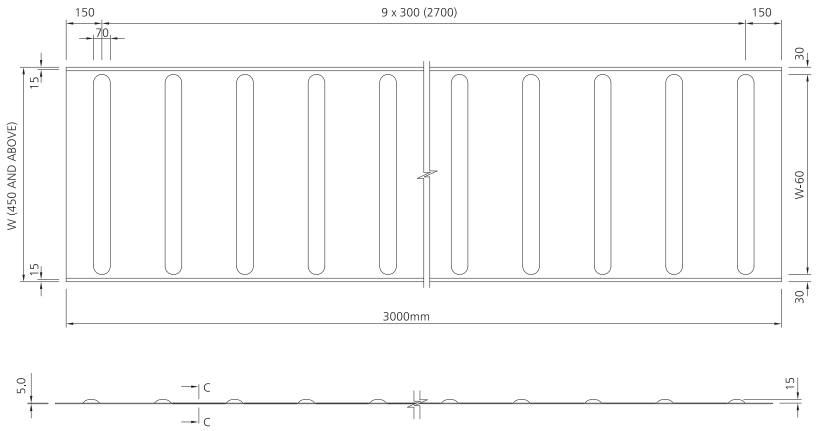


W=150, 300

FLAT COVER



SECTION C-C

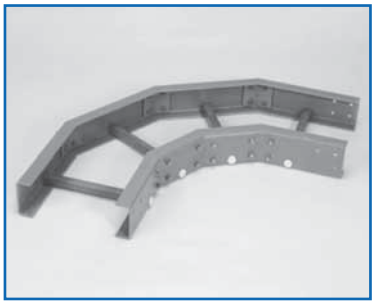


W=450, 600, 750, 900

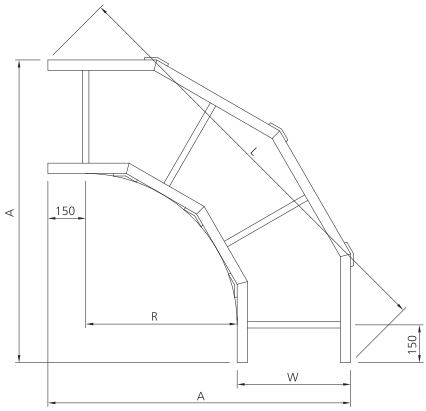
FRP RIBBED COVER FOR CABLE LADDER

* Thickness of FRP side rail for LM Series is 4.8mm unless otherwise specified.

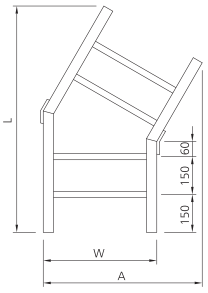
Cable Ladder - LM Series



LM Series-Horizontal Bend



90° HORIZONTAL BEND
(90° HB)



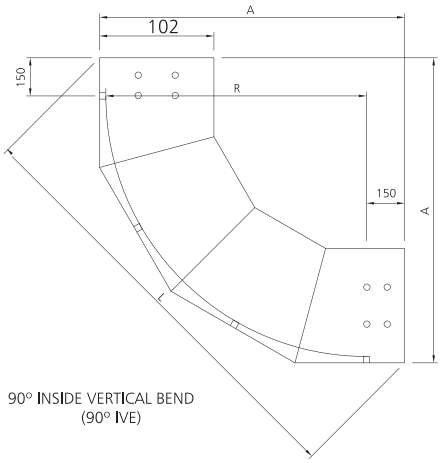
30°/45° HORIZONTAL BEND
(30°/45° HB)

90° HB		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LM 90 HB 150	150	600	849	900	1273	1200	1697
LM 90 HB 300	300	750	1061	1050	1485	1350	1909
LM 90 HB 450	450	900	1273	1200	1697	1500	2121
LM 90 HB 600	600	1050	1485	1350	1909	1650	2333
LM 90 HB 750	750	1200	1697	1500	2121	1800	2546
LM 90 HB 900	900	1350	1909	1650	2333	1950	2758

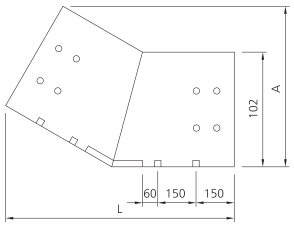
45° HORIZONTAL BEND			
REF NO	W	A	L
LM 45 HB 150	150	405	721
LM 45 HB 300	300	555	827
LM 45 HB 450	450	705	933
LM 45 HB 600	600	855	1039
LM 45 HB 750	750	1005	1145
LM 45 HB 900	900	1155	1251

30° HORIZONTAL BEND			
REF NO	W	A	L
LM 30 HB 150	150	320	747
LM 30 HB 300	300	480	822
LM 30 HB 450	450	630	897
LM 30 HB 600	600	780	972
LM 30 HB 750	750	930	1047
LM 30 HB 900	900	1080	1122

LM Series-Inside Vertical Bend



90° INSIDE VERTICAL BEND
(90° IVE)



30°/45° INSIDE VERTICAL BEND
(30°/45° IVE)

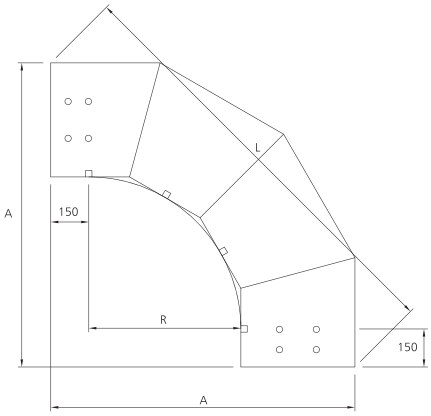
90° IVE		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LM 90 IVE 150	150	482	682	782	1106	1082	1530
LM 90 IVE 300	150	482	682	782	1106	1082	1530
LM 90 IVE 450	150	482	682	782	1106	1082	1530
LM 90 IVE 600	150	482	682	782	1106	1082	1530
LM 90 IVE 750	150	482	682	782	1106	1082	1530
LM 90 IVE 900	150	482	682	782	1106	1082	1530

45° INSIDE VERTICAL BEND			
REF NO	W	A	L
LM 45 IVE 150	150	284	686
LM 45 IVE 300	300	284	686
LM 45 IVE 450	450	284	686
LM 45 IVE 600	600	284	686
LM 45 IVE 750	750	284	686
LM 45 IVE 900	900	284	686

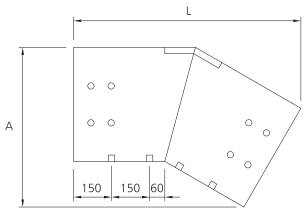
30° INSIDE VERTICAL BEND			
REF NO	W	A	L
LM 30 IVE 150	150	194	724
LM 30 IVE 300	300	194	724
LM 30 IVE 450	450	194	724
LM 30 IVE 600	600	194	724
LM 30 IVE 750	750	194	724
LM 30 IVE 900	900	194	724

Cable Ladder - LM Series

LM Series-Outside Vertical Bend



90° OUTSIDE VERTICAL BEND
(90° OVE)

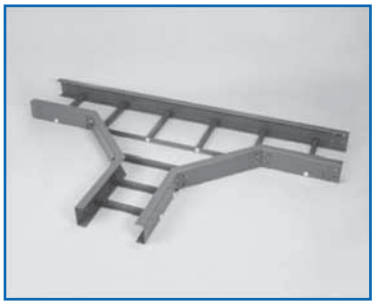


30°/45° OUTSIDE VERTICAL BEND
(30°/45° OVE)

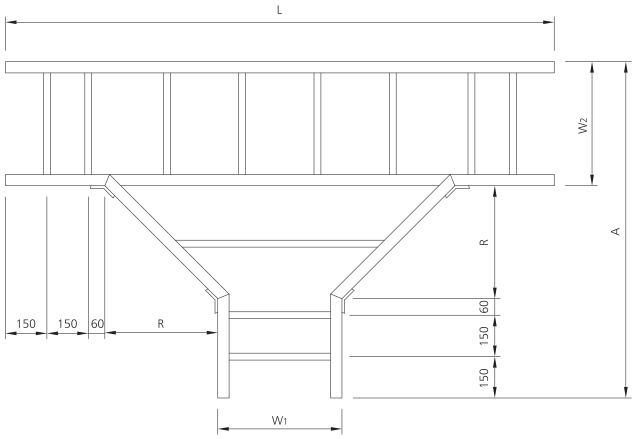
90° OVE		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LM 90 OVE 150	150	552	781	852	1205	1152	1629
LM 90 OVE 300	300	552	781	852	1205	1152	1629
LM 90 OVE 450	450	552	781	852	1205	1152	1629
LM 90 OVE 600	600	552	781	852	1205	1152	1629
LM 90 OVE 750	750	552	781	852	1205	1152	1629
LM 90 OVE 900	900	552	781	852	1205	1152	1629

45° OUTSIDE VERTICAL BEND			
REF NO	W	A	L
LM 45 OVE 150	150	357	687
LM 45 OVE 300	300	357	687
LM 45 OVE 450	450	357	687
LM 45 OVE 600	600	357	687
LM 45 OVE 750	750	357	687
LM 45 OVE 900	900	357	687

30° OUTSIDE VERTICAL BEND			
REF NO	W	A	L
LM 30 OVE 150	150	282	723
LM 30 OVE 300	300	282	723
LM 30 OVE 450	450	282	723
LM 30 OVE 600	600	282	723
LM 30 OVE 750	750	282	723
LM 30 OVE 900	900	282	723



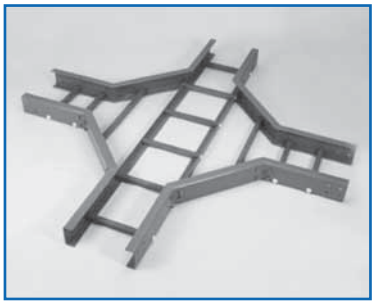
LM Series-Horizontal Tee



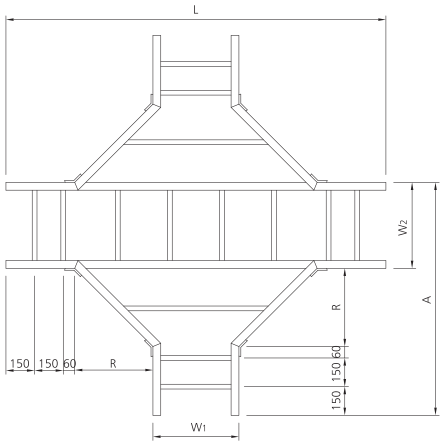
HORIZONTAL EQUAL TEE
(HT)

90° HT		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMHT 150	150	810	1470	1110	2070	1410	2670
LMHT 300	300	960	1620	1260	2220	1560	2920
LMHT 450	450	1110	1770	1410	2370	1710	2970
LMHT 600	600	1260	1920	1560	2520	1860	3120
LMHT 750	750	1410	2070	1710	2670	2010	3270
LMHT 900	900	1560	2220	1860	2820	2160	3420

Cable Ladder - LM Series

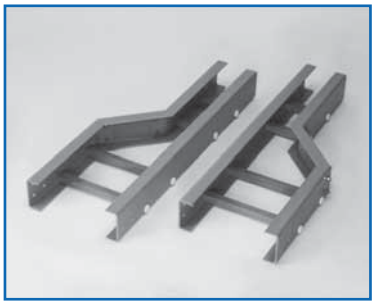


LM Series-Horizontal Cross

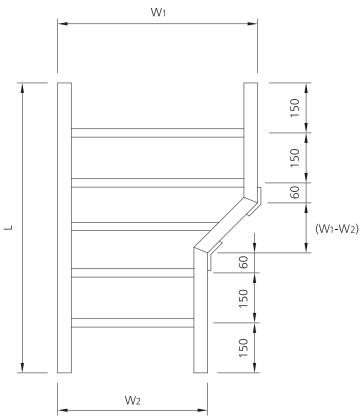


HORIZONTAL EQUAL CROSS
(HC)

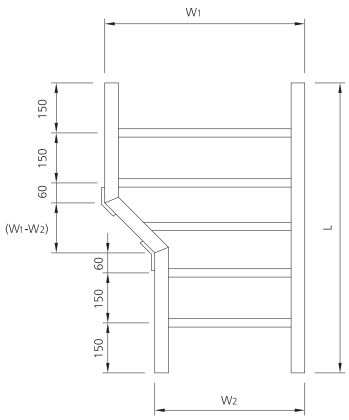
90° HC		R = 300		R = 600		R = 900	
REF NO	W	A	L	A	L	A	L
LMHC 150	150	1470	1470	2070	2070	2670	2670
LMHC 300	300	1620	1620	2220	2220	2920	2920
LMHC 450	450	1770	1770	2370	2370	2970	2970
LMHC 600	600	1920	1920	2520	2520	3120	3120
LMHC 750	750	2070	2070	2670	2670	3270	3270
LMHC 900	900	2220	2220	2820	2820	3420	3420



LM Series-Left/Right
Hand Reducer



RIGHT HAND REDUCER
(RHR)

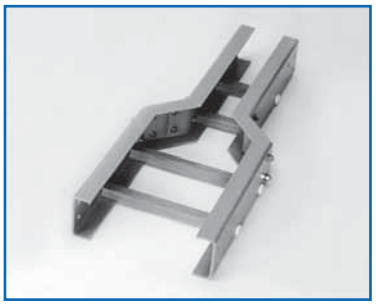


LEFT HAND REDUCER
(LHR)

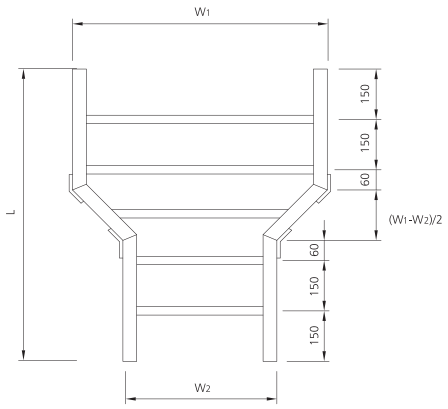
RHR AND LHR			
REF NO	W1	W2	L
LM RHR (LHR) 900-750	900	750	870
LM RHR (LHR) 900-600	900	600	1020
LM RHR (LHR) 900-450	900	450	1170
LM RHR (LHR) 900-300	900	300	1320
LM RHR (LHR) 900-150	900	150	1470
LM RHR (LHR) 750-600	750	600	870
LM RHR (LHR) 750-450	750	450	1020
LM RHR (LHR) 750-300	750	300	1170

RHR AND LHR			
REF NO	W1	W2	L
LM RHR (LHR) 750-150	750	150	1320
LM RHR (LHR) 600-450	600	450	870
LM RHR (LHR) 600-300	600	300	1020
LM RHR (LHR) 600-150	600	150	1170
LM RHR (LHR) 450-300	450	300	870
LM RHR (LHR) 450-150	450	150	1020
LM RHR (LHR) 300-150	300	150	870

Cable Ladder - LM Series

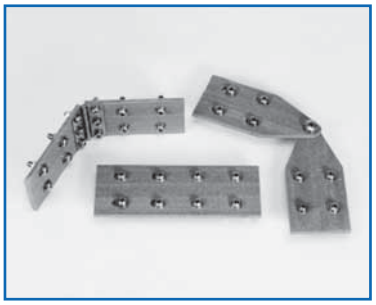


LM Series-Straight Reducer

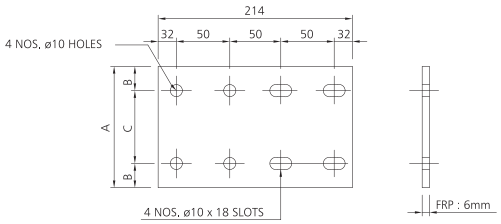


STRAIGHT REDUCER
(SR)

STRAIGHT REDUCER (SR)			
REF NO	W_1	W_2	L
LM SR 900-750	900	750	795
LM SR 900-600	900	600	870
LM SR 900-450	900	450	945
LM SR 900-300	900	300	1020
LM SR 900-150	900	150	1095
LM SR 750-600	750	600	795
LM SR 750-450	750	450	870
LM SR 750-300	750	300	945
LM SR 750-150	750	150	1070
LM SR 600-450	600	450	795
LM SR 600-300	600	300	870
LM SR 600-150	600	150	945
LM SR 450-300	450	300	795
LM SR 450-150	450	150	870
LM SR 300-150	300	150	795

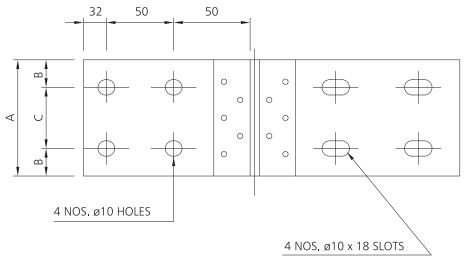


LM Series-Splice Plate

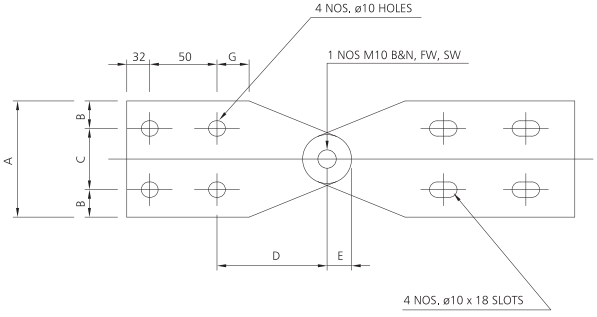


LM-EXPANSION SPLICE PLATE (ESP)

LM-ESP DIMENSIONS			
LADDER TYPE	A	B	C
LM	76	18	40



HORIZONTAL ADJUSTABLE SPLICE PLATE
(HESP)



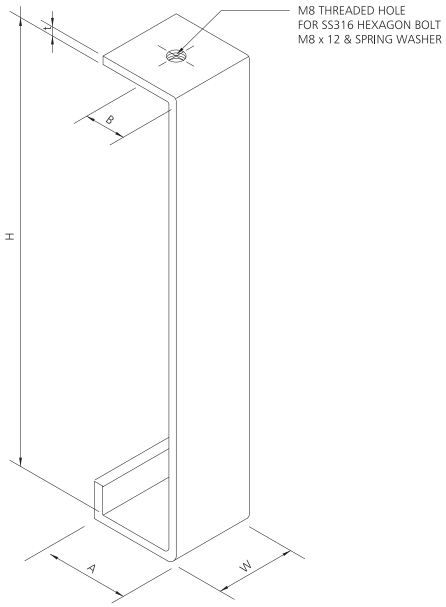
VERTICAL ADJUSTABLE SPLICE PLATE
(VESP)

LM-HESP DIMENSIONS			
LADDER TYPE	A	B	C
LM	76	18	40

LM-VESP DIMENSIONS						
LADDER TYPE	A	B	C	D	E	G
LM	76	18	40	75	16	15

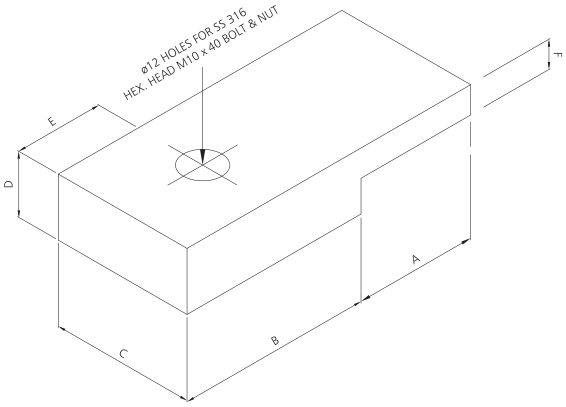
Cable Ladder - LM Series

LM Series-Cover Clamp-SS316 (CC-SS)



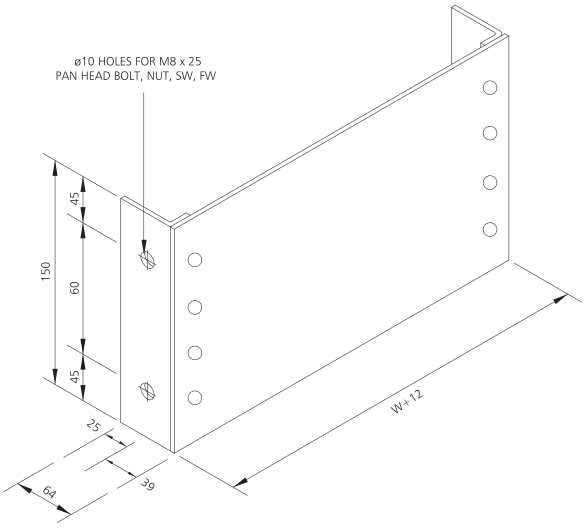
CC-SS					
LADDER TYPE	H	W	t	A	B
LM	111	30	2.0	48	24

LM Series-Hold Down Clamp (HDC)

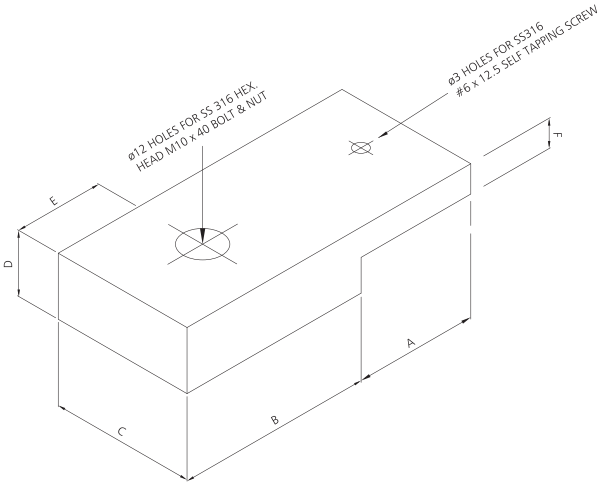


HDC						
LADDER TYPE	A	B	C	D	E	F
LM	27	37	40	10.7	25	6

LM Series-Blind End Plate (BEP)

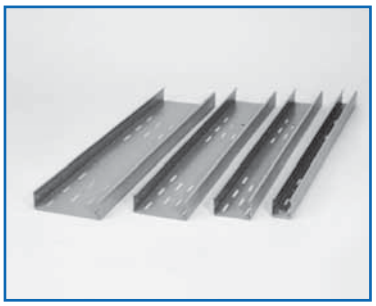


LM Series-Vertical Fixing Clamp (VFC)

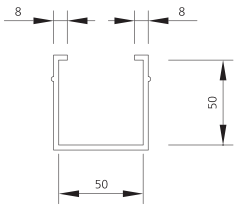


VFC						
LADDER TYPE	A	B	C	D	E	F
LM	27	37	40	10.7	25	6

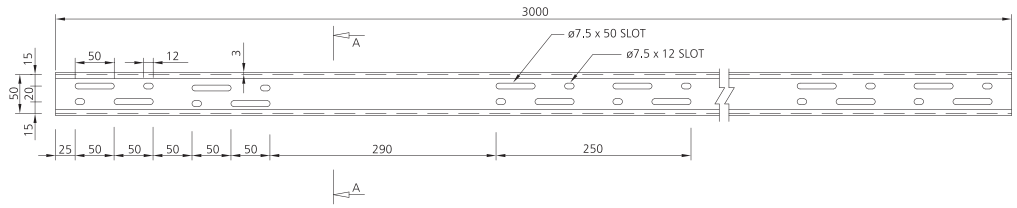
Cable Tray



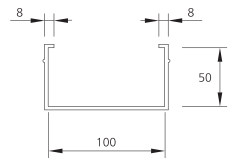
Cable Tray Pultruded Type,
"C" Shape



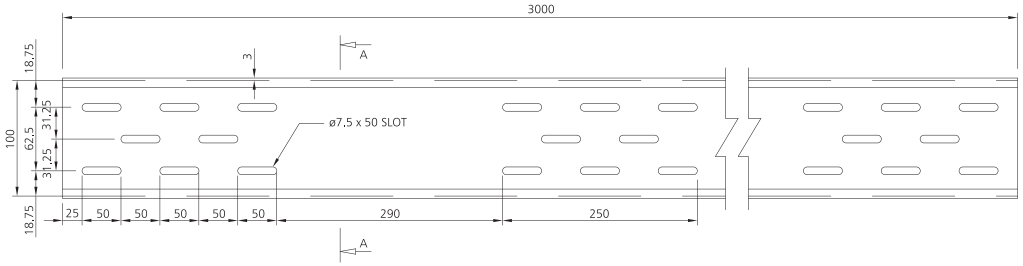
SECTION A-A



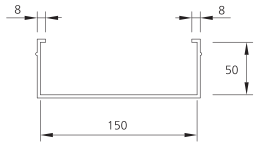
TP 050 50 C-STRAIGHT RUN



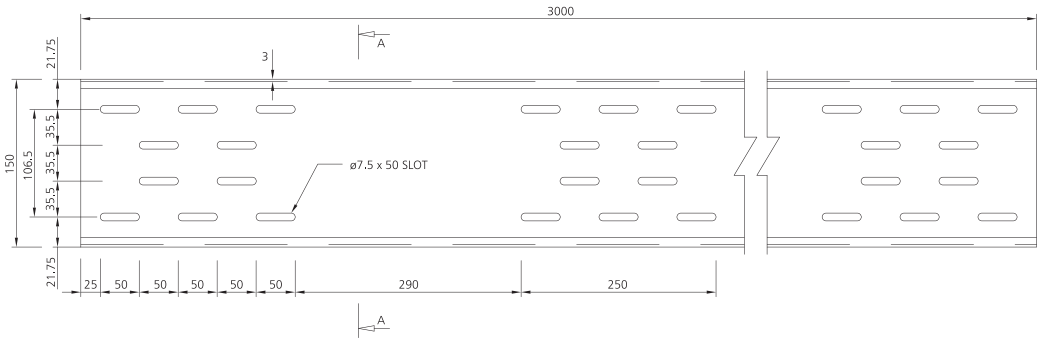
SECTION A-A



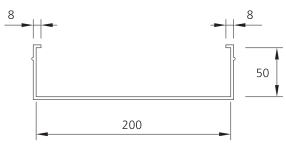
TP 100 50 C-STRAIGHT RUN



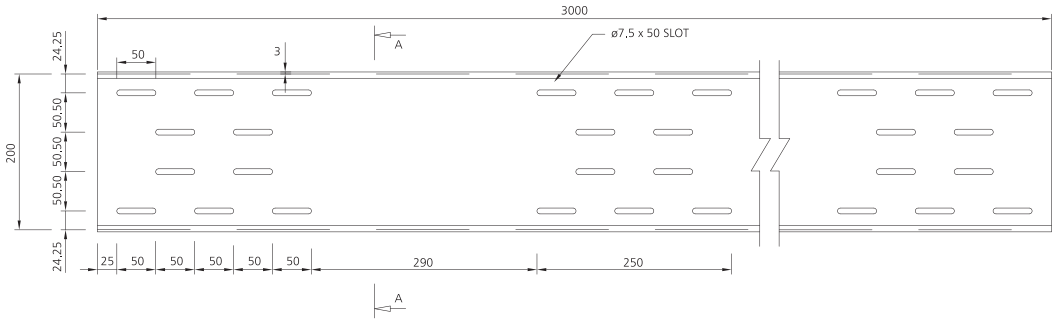
SECTION A-A



TP 150 50 C-STRAIGHT RUN



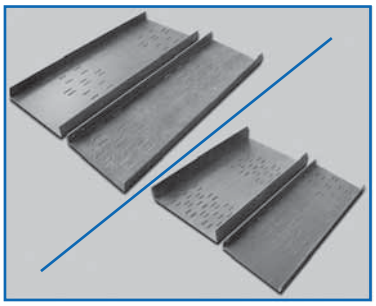
SECTION A-A



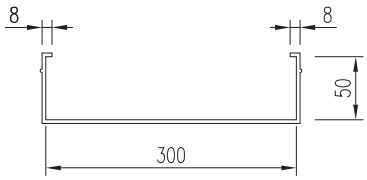
TP 200 50 C-STRAIGHT RUN

* Thickness of Cable Tray = 3mm

Cable Tray

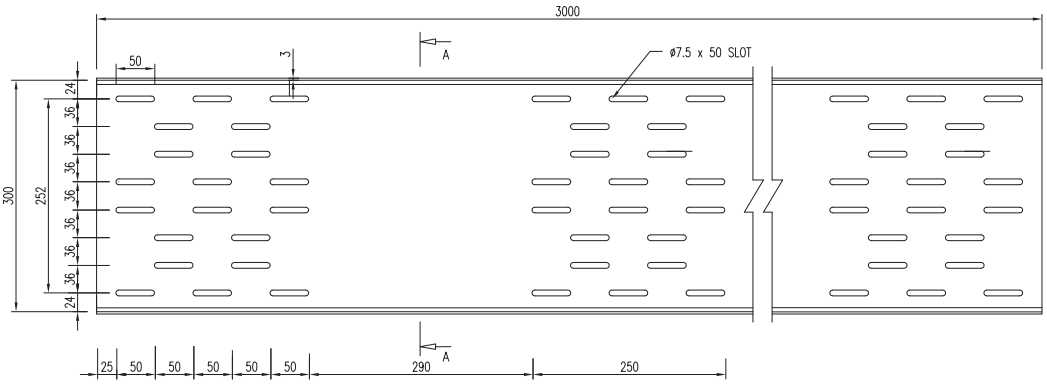


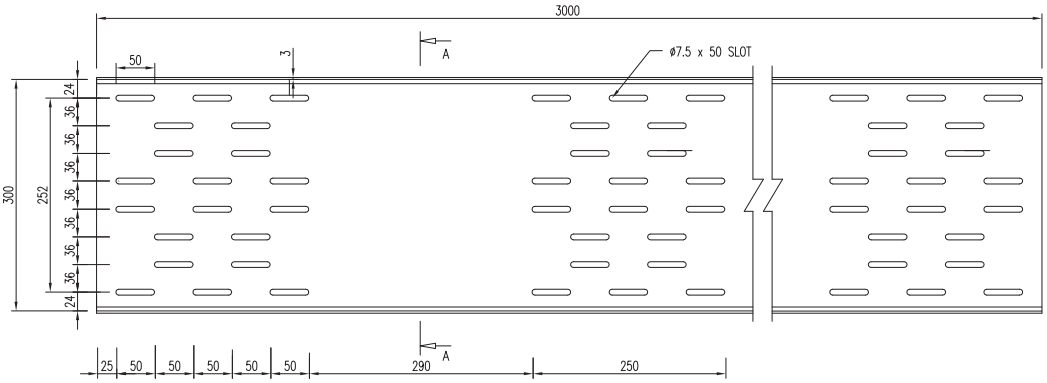
Cable Tray Pultruded Type,
"C" Shape

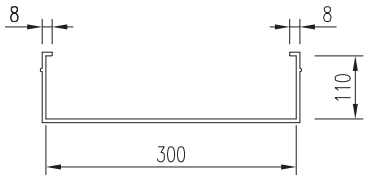


SECTION A-A

TP 300 50 C-STRAIGHT RUN

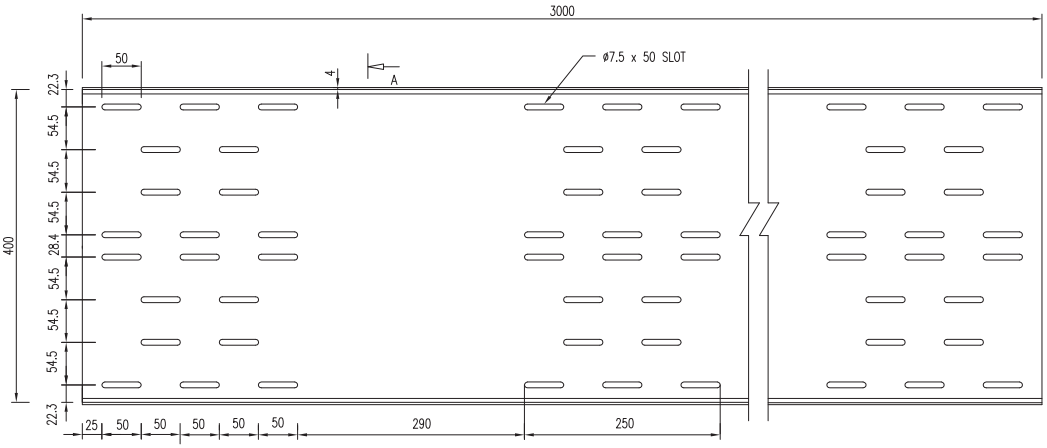


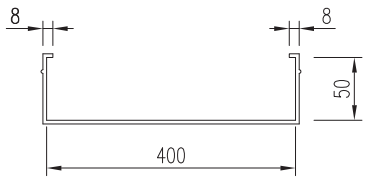




SECTION A-A

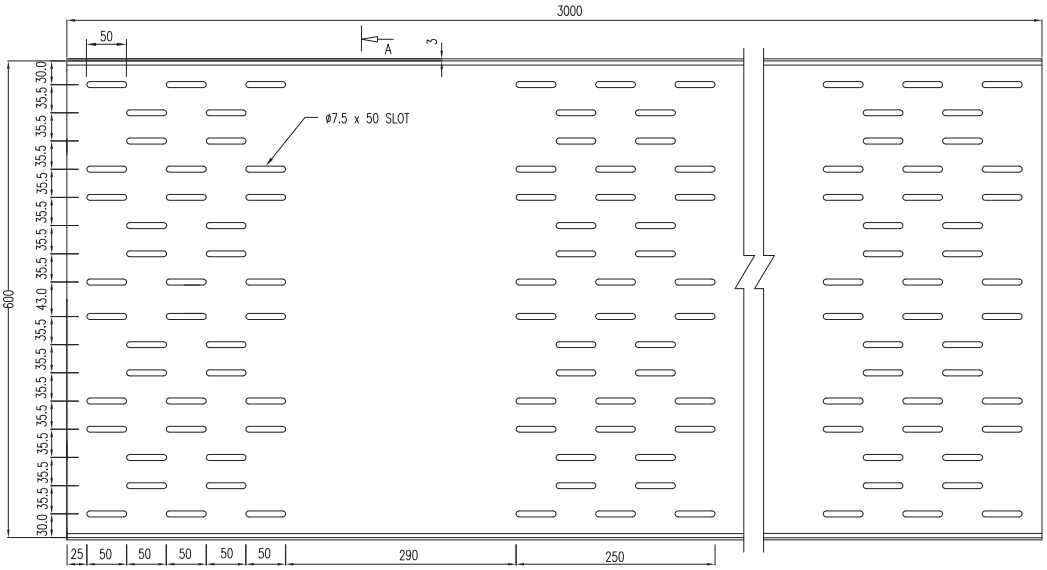
TP 300 110 C-STRAIGHT RUN

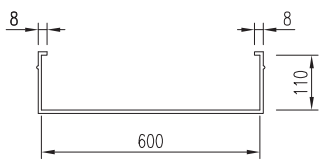




SECTION A-A

TP 400 50 C-STRAIGHT RUN

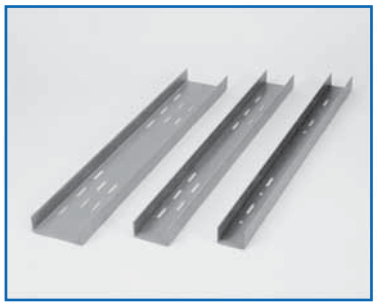




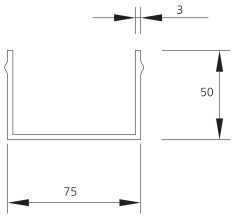
SECTION A-A

TP 600 110 C-STRAIGHT RUN

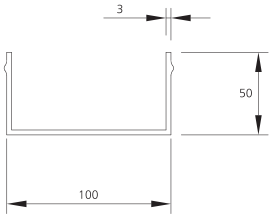
Cable Tray



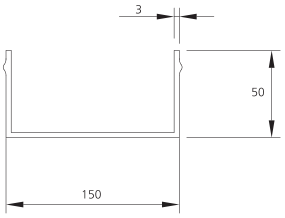
Cable Tray Pultruded Type,
"U" Shape



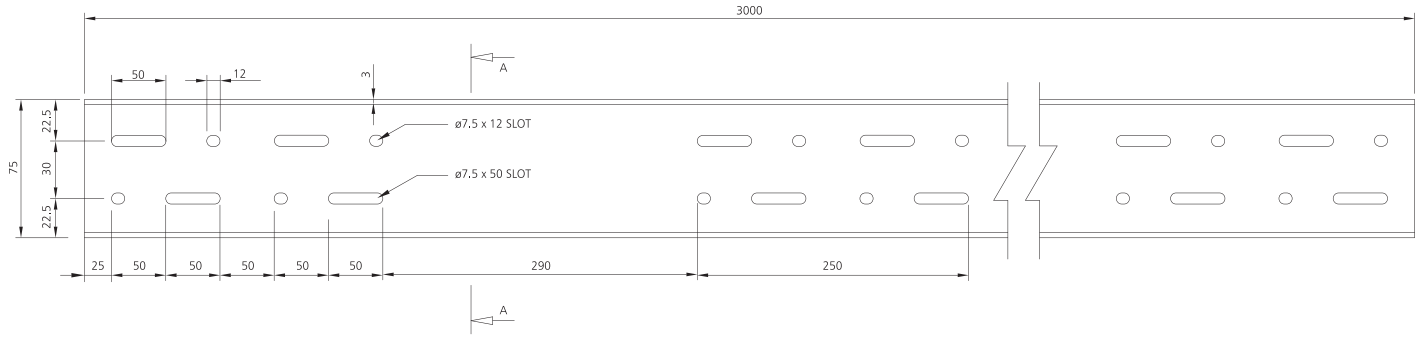
SECTION A-A



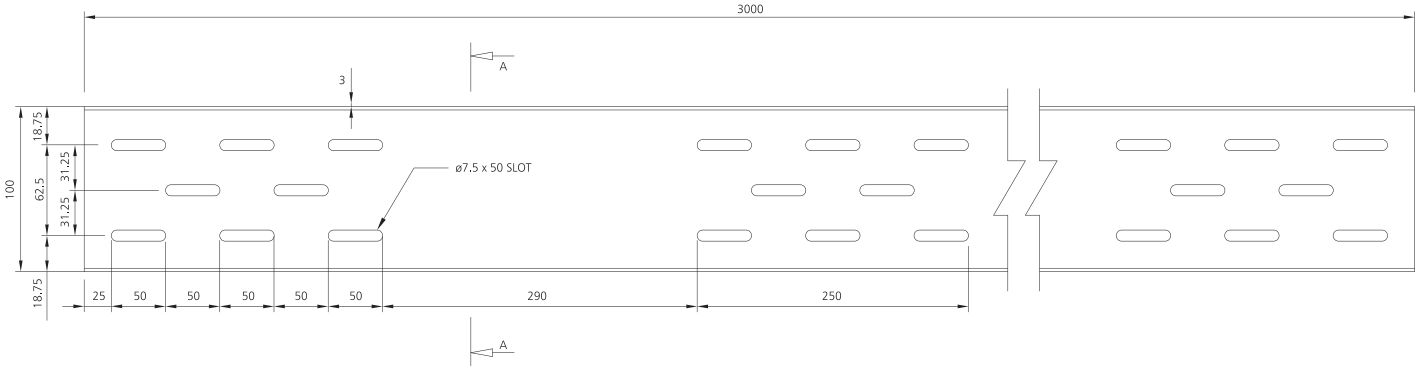
SECTION A-A



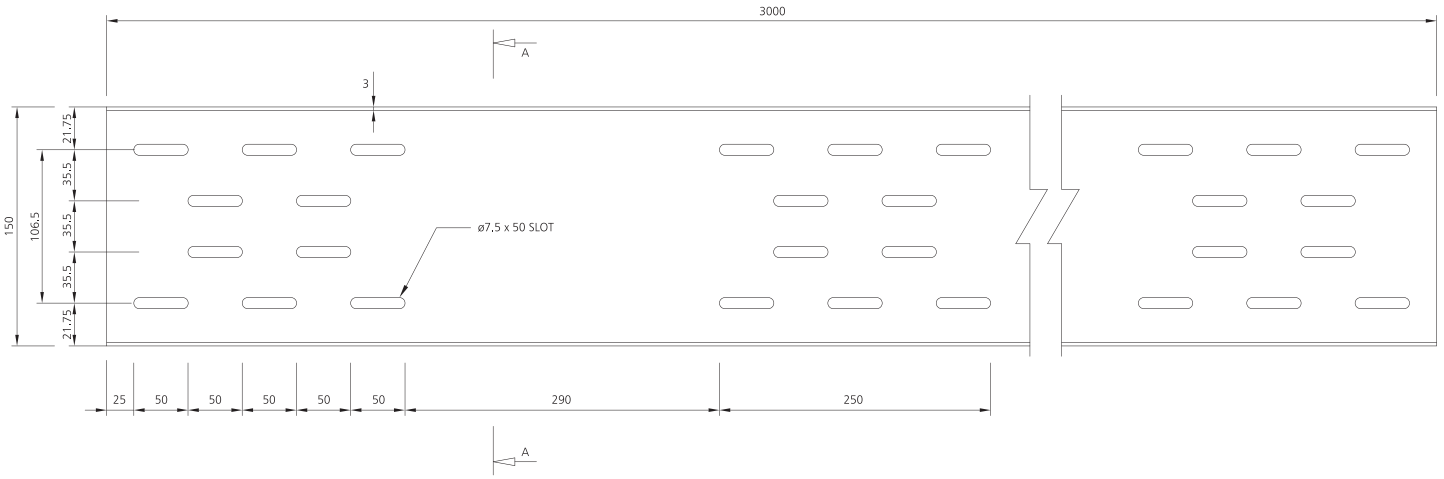
SECTION A-A



TP 075 50 U-STRAIGHT RUN

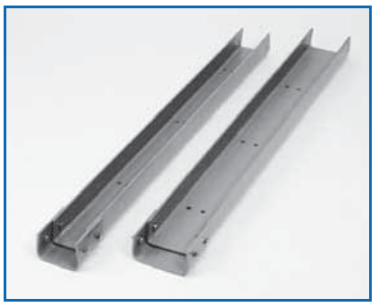


TP 100 50 U-STRAIGHT RUN

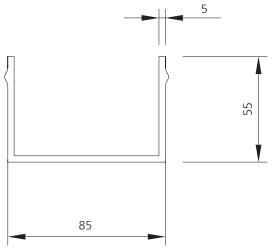


TP 150 50 U-STRAIGHT RUN

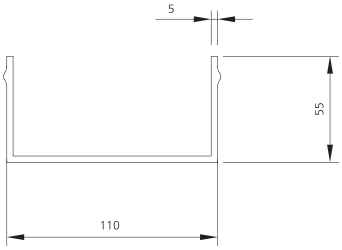
Cable Tray



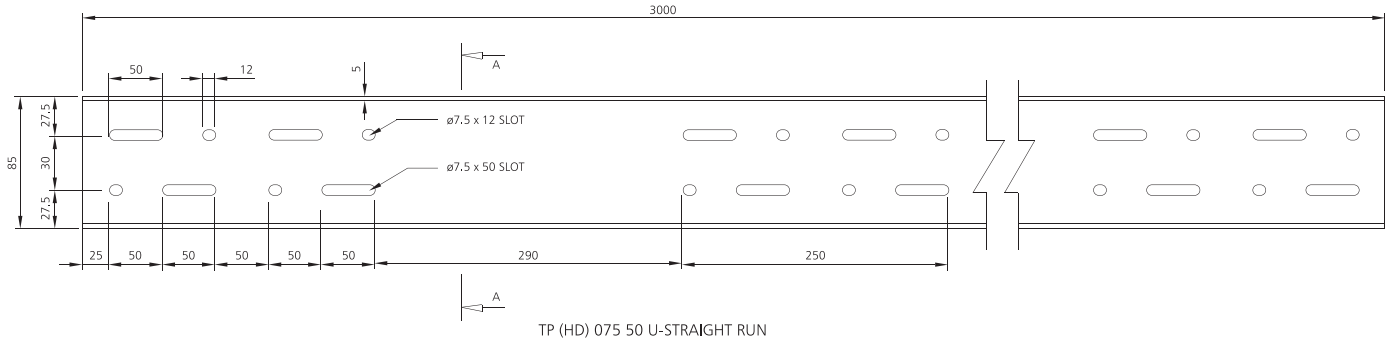
Cable Tray Pultruded Type
(Heavy Duty), "U" Shape



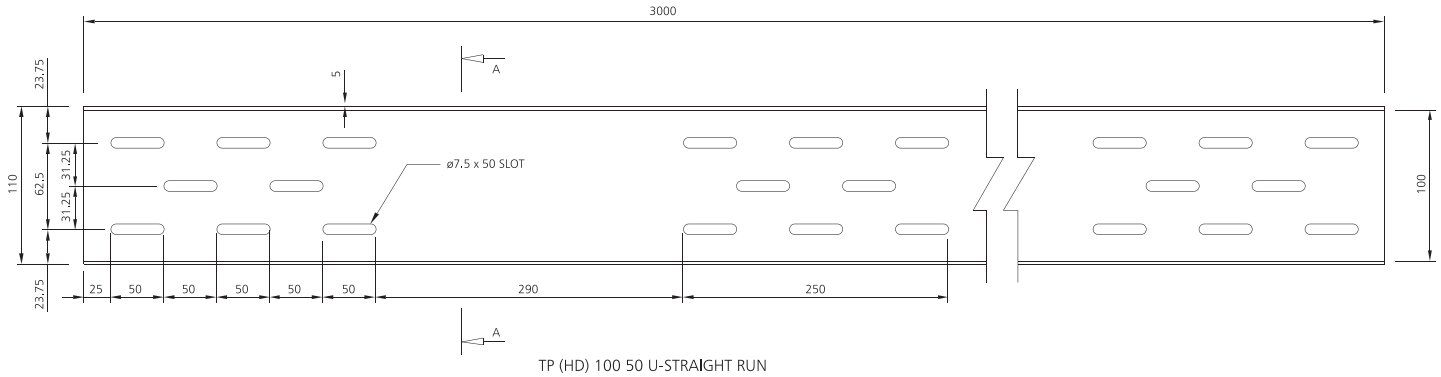
SECTION A-A



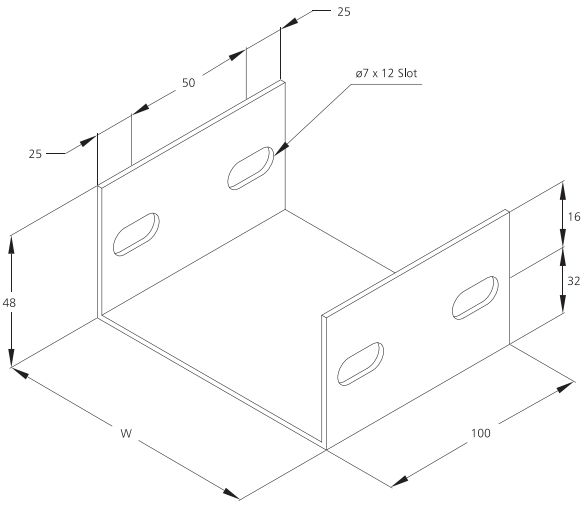
SECTION A-A



TP (HD) 075 50 U-STRAIGHT RUN



TP (HD) 100 50 U-STRAIGHT RUN



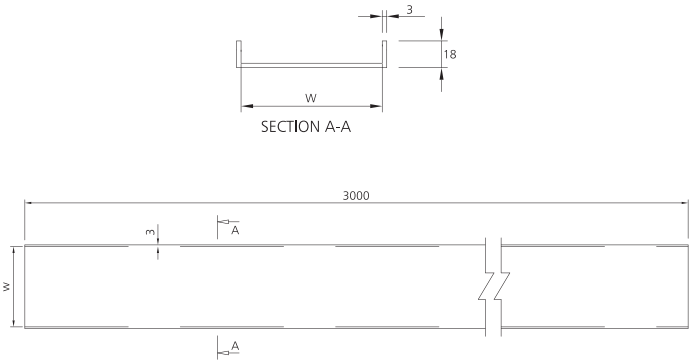
TRAY CONNECTOR PLATE

FRP CONNECTOR PLATE FOR CABLE TRAY (HEAVY DUTY)		
TRAY W :	TP (HD) 75	TP (HD) 100
CP, W :	93	118

FRP CONNECTOR THICKNESS = 4 MM

Cable Tray

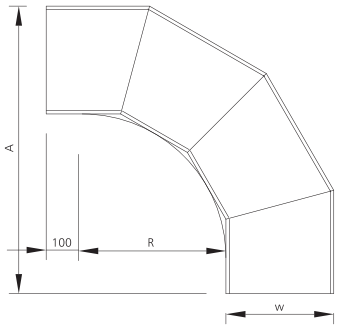
Cable Tray-C Series &
U Series-Cover



COVER TYPE	W
TP 050 50 C	50
TP 100 50 C	100
TP 150 50 C	150
TP 200 50 C	200
TP 300 50 C	300
TP 400 50 C	400
TP 600 110 C	600

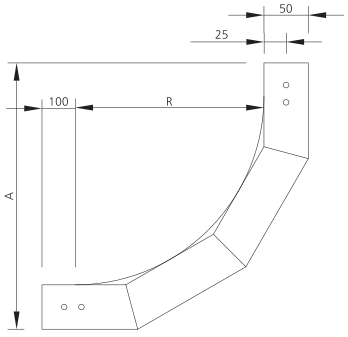
COVER TYPE	W
TP 075 50 U	75
TP 100 50 U	100
TP 150 50 U	150

Cable Tray-Horizontal Bend

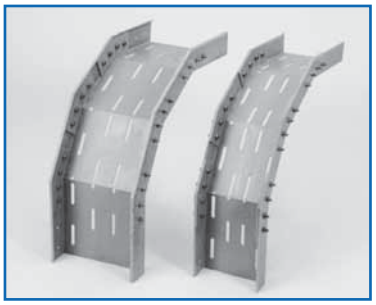


TPU/TPC 90° HB			
TRAY TYPE	W	A	R
TP 600 110 C	600	1000	300
TP 300 110 C	300	700	300
TP 400 50 C	400	800	300
TP 300 50 C	300	700	300
TP 200 50 C	200	600	300
TP 150 50 U/C	150	550	300
TP 100 50 U/C	100	500	300
TP 075 50 U	75	475	300
TP 050 50 C	50	400	300

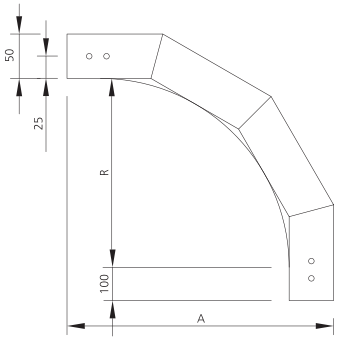
Cable Tray-Inside Vertical Bend



TPU/TPC 90° IVB			
TRAY TYPE	W	A	R
TP 600 110 C	600	510	300
TP 300 110 C	300	510	300
TP 400 50 C	400	450	300
TP 300 50 C	300	450	300
TP 200 50 C	200	450	300
TP 150 50 U/C	150	450	300
TP 100 50 U/C	100	450	300
TP 075 50 U	75	450	300
TP 050 50 C	50	450	300

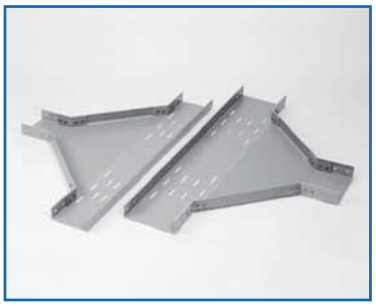


Cable Tray-Outside Vertical Bend

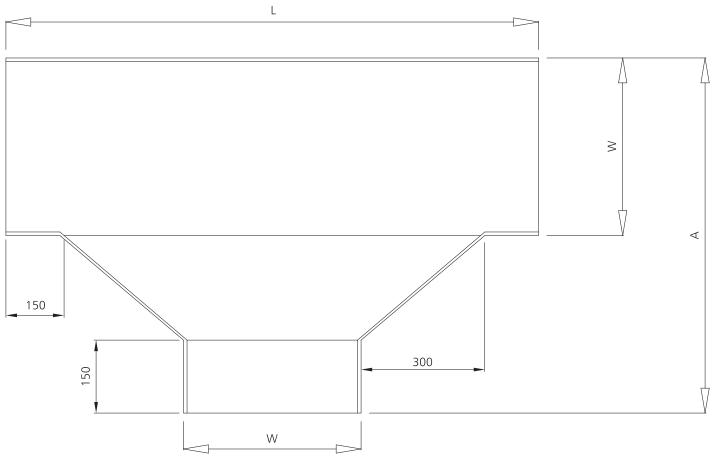


TPU/TPC 90° OVB			
TRAY TYPE	W	A	R
TP 600 110 C	600	510	300
TP 300 110 C	300	510	300
TP 400 50 C	400	450	300
TP 300 50 C	300	450	300
TP 200 50 C	200	450	300
TP 150 50 U/C	150	450	300
TP 100 50 U/C	100	450	300
TP 075 50 U	75	450	300
TP 050 50 C	50	450	300

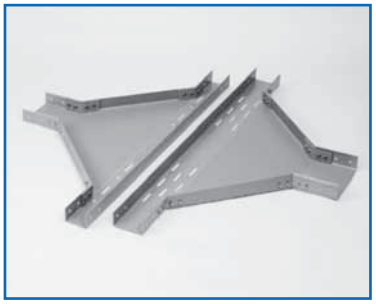
Cable Tray



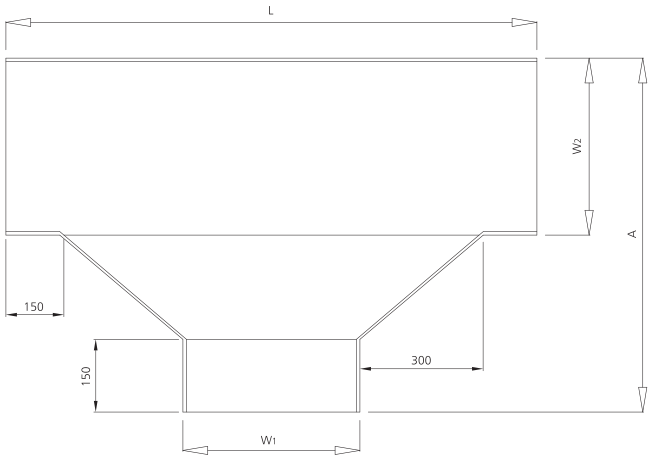
Cable Tray-Horizontal
Equal Tee



TPU/TPC 90° ET			
TRAY TYPE	W	A	L
TP 600 110 C	600	1050	1500
TP 300 110 C	300	750	1200
TP 400 50 C	400	850	1300
TP 300 50 C	300	750	1200
TP 200 50 C	200	650	1100
TP 150 50 U/C	150	600	1050
TP 100 50 U/C	100	550	1000
TP 075 50 U	75	525	975
TP 050 50 C	50	500	950



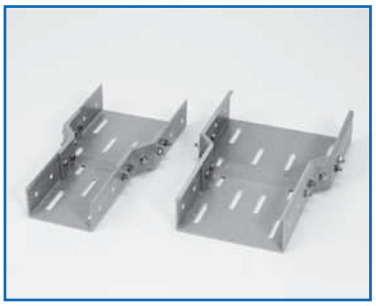
Cable Tray-Horizontal
Unequal Tee



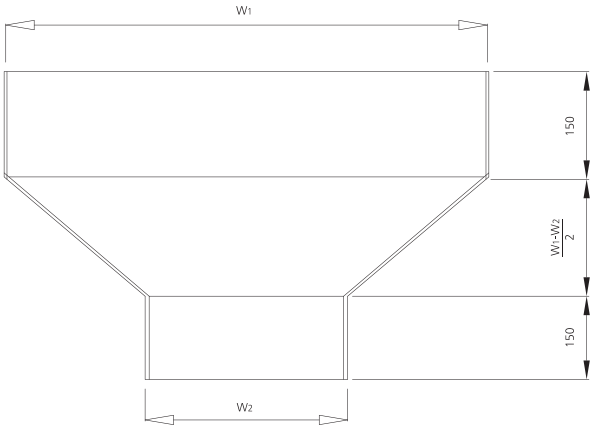
TPU/TPC 90° UET				
TRAY TYPE	W1	W2	A	L
TP 050 50/075 50 C/U	50	75	525	950
TP 050 50/100 50 C/U	50	100	550	950
TP 050 50/150 50 C/U	50	150	600	950
TP 050 50/200 50 C/U	50	200	650	950
TP 050 50/300 50 C/U	50	300	750	950
TP 050 50/400 50 C/U	50	400	850	950
TP 075 50/050 50 C/U	75	50	500	975
TP 075 50/100 50 C/U	75	100	550	975
TP 075 50/150 50 C/U	75	150	600	975
TP 075 50/200 50 C/U	75	200	650	975
TP 075 50/300 50 C/U	75	300	750	975
TP 075 50/400 50 C/U	75	400	850	975
TP 100 50/050 50 C/U	100	50	500	1000
TP 100 50/075 50 C/U	100	75	525	1000
TP 100 50/150 50 C/U	100	150	600	1000
TP 100 50/200 50 C/U	100	200	650	1000
TP 100 50/300 50 C/U	100	300	750	1000
TP 100 50/400 50 C/U	100	400	850	1000
TP 150 50/050 50 C/U	150	50	500	1050
TP 150 50/075 50 C/U	150	75	525	1050
TP 150 50/100 50 C/U	150	100	550	1050
TP 150 50/200 50 C/U	150	200	650	1050

TPU/TPC 90° UET				
TRAY TYPE	W1	W2	A	L
TP 150 50/300 50 C/U	150	300	750	1050
TP 150 50/400 50 C/U	150	400	850	1050
TP 200 50/050 50 C/U	200	50	500	1100
TP 200 50/075 50 C/U	200	75	525	1100
TP 200 50/100 50 C/U	200	100	550	1100
TP 200 50/150 50 C/U	200	150	600	1100
TP 200 50/300 50 C/U	200	300	750	1100
TP 200 50/400 50 C/U	200	400	850	1100
TP 300 50/050 50 C/U	300	50	500	1200
TP 300 50/075 50 C/U	300	75	525	1200
TP 300 50/100 50 C/U	300	100	550	1200
TP 300 50/150 50 C/U	300	150	600	1200
TP 300 50/200 50 C/U	300	200	650	1200
TP 300 50/400 50 C/U	300	400	850	1200
TP 300 110/600 110 C/U	300	600	1050	1200
TP 400 50/050 50 C/U	400	50	500	1300
TP 400 50/075 50 C/U	400	75	525	1300
TP 400 50/100 50 C/U	400	100	550	1300
TP 400 50/150 50 C/U	400	150	600	1300
TP 400 50/200 50 C/U	400	200	650	1300
TP 400 50/300 50 C/U	400	300	750	1300
TP 600 110/300 110 C/U	600	300	750	1500

Cable Tray



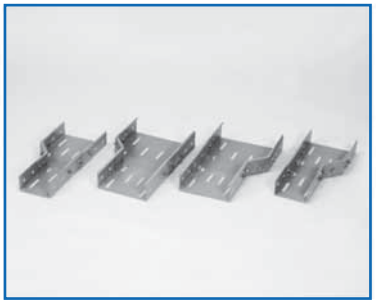
Cable Tray-Straight Reducer



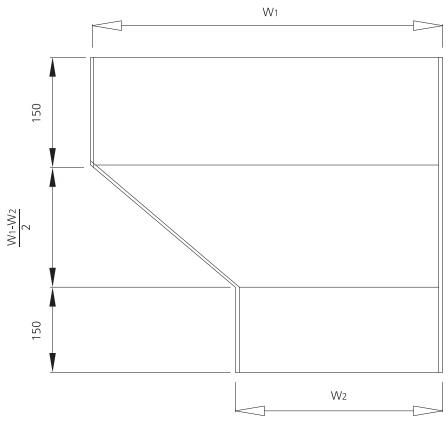
TPU, TPC, SR		
TRAY TYPE	W1	W2
TP 075 50/050 50 C/U	75	50
TP 100 50/075 50 C/U	100	75
TP 100 50/050 50 C/U	100	50
TP 150 50/100 50 C/U	150	100
TP 150 50/075 50 C/U	150	75
TP 150 50/050 50 C/U	150	50
TP 200 50/150 50 C/U	200	150
TP 200 50/100 50 C/U	200	100
TP 200 50/075 50 C/U	200	75
TP 200 50/050 50 C/U	200	50

TPU, TPC, SR		
TRAY TYPE	W1	W2
TP 300 50/200 50 C/U	300	200
TP 300 50/150 50 C/U	300	150
TP 300 50/100 50 C/U	300	100
TP 300 50/075 50 C/U	300	75
TP 300 50/050 50 C/U	300	50
TP 400 50/300 50 C/U	400	300

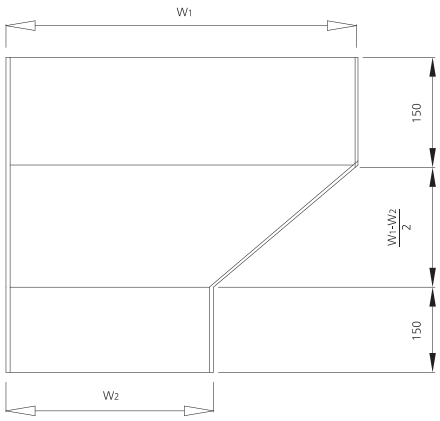
TPU, TPC, SR		
TRAY TYPE	W1	W2
TP 400 50/200 50 C/U	400	200
TP 400 50/150 50 C/U	400	150
TP 400 50/100 50 C/U	400	100
TP 400 50/075 50 C/U	400	75
TP 400 50/050 50 C/U	400	50
TP 600 110/300 110 C/U	600	300



Cable Tray-Right/Left Hand Reducer



LEFT HAND REDUCER (LHR)

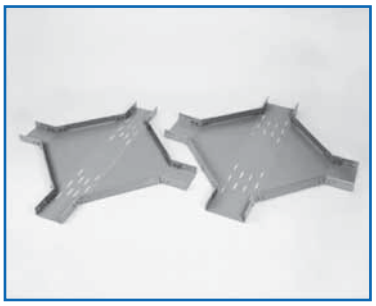


RIGHT HAND REDUCER (RHR)

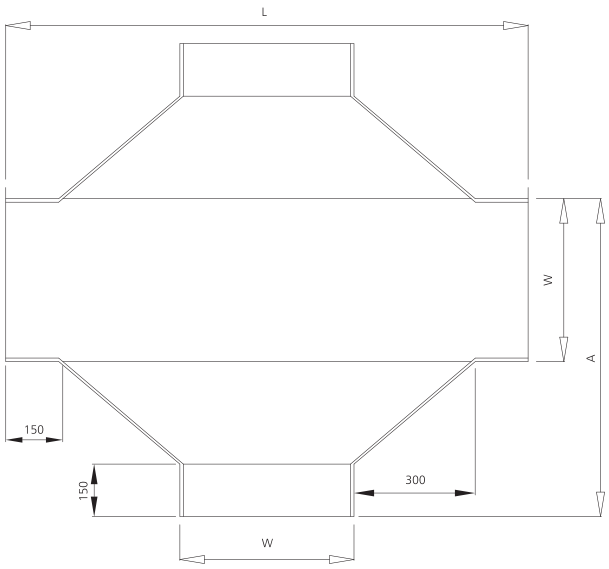
TPU, TPC, RHR/LHR		
TRAY TYPE	W1	W2
TP 075 50/050 50 C/U	75	50
TP 100 50/075 50 C/U	100	75
TP 100 50/050 50 C/U	100	50
TP 150 50/100 50 C/U	150	100
TP 150 50/075 50 C/U	150	75
TP 150 50/050 50 C/U	150	50
TP 200 50/150 50 C/U	200	150
TP 200 50/100 50 C/U	200	100
TP 200 50/075 50 C/U	200	75
TP 200 50/050 50 C/U	200	50
TP 300 50/200 50 C/U	300	200

TPU, TPC, RHR/LHR		
TRAY TYPE	W1	W2
TP 300 50/150 50 C/U	300	150
TP 300 50/100 50 C/U	300	100
TP 300 50/075 50 C/U	300	75
TP 300 50/050 50 C/U	300	50
TP 400 50/300 50 C/U	400	300
TP 400 50/200 50 C/U	400	200
TP 400 50/150 50 C/U	400	150
TP 400 50/100 50 C/U	400	100
TP 400 50/075 50 C/U	400	75
TP 400 50/050 50 C/U	400	50
TP 600 110/300 110 C/U	600	300

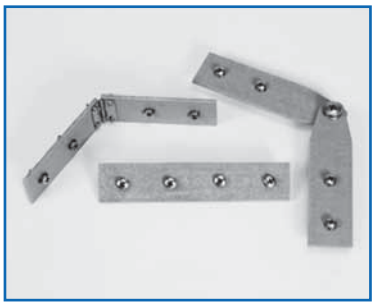
Cable Tray



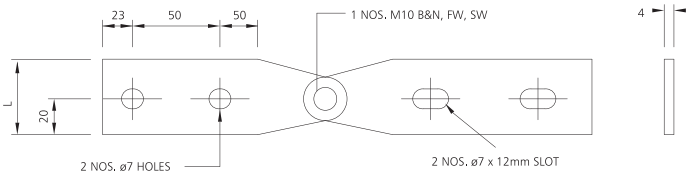
Cable Tray-Horizontal
Equal Cross



TPU, TPC, 90° EC			
TRAY TYPE	W	A	L
TP 600 110 C	600	1050	1500
TP 300 110 C	300	750	1200
TP 400 50 C	400	850	1300
TP 300 50 C	300	750	1200
TP 200 50 C	200	650	1100
TP 150 50 U/C	150	600	1050
TP 100 50 U/C	100	550	1000
TP 075 50 U	75	525	975
TP 050 50 C	50	500	950

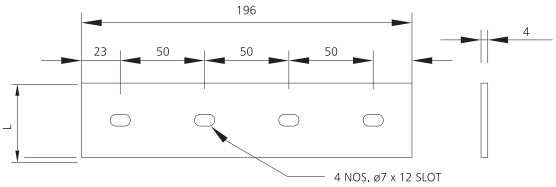


Cable Tray-Splice Plate

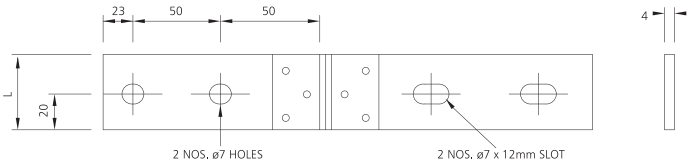


TPC &TPU VERTICAL ADJUSTABLE SPLICE PLATE-TRAY (50Ht)
(TPC, TPU VESP)

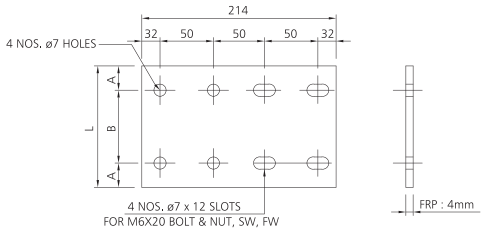
TPU / TPC SPLICE PLATE (50Ht)		
SPLICE PLATE TYPE	Ht	L
EXPANSION SPLICE PLATE, ESP	50	40
HORIZONTAL ADJUSTABLE SPLICE PLATE, HESP	50	40
VERTICAL ADJUSTABLE SPLICE PLATE, VESP	50	40



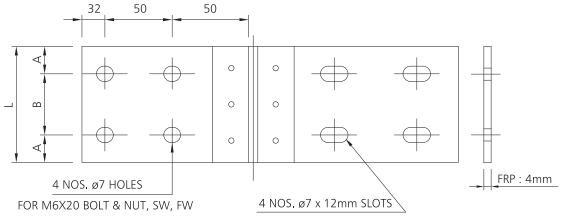
TRAY EXPANSION SPLICE PLATE (50Ht)
(TPC, TPU ESP)



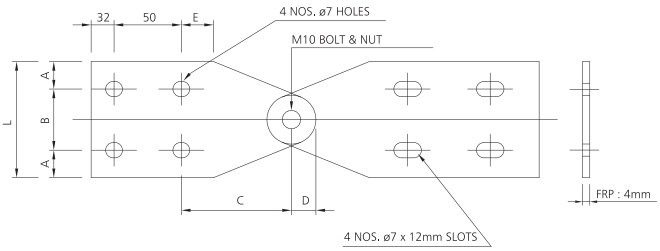
TPC & TPU HORIZONTAL ADJUSTABLE SPLICE PLATE-TRAY (50Ht)
(TPC, TPU HESP)



TRAY EXPANSION SPLICE PLATE (110Ht)
(TPC ESP)



TRAY HORIZONTAL ADJUSTABLE SPLICE PLATE (110Ht)
(TPC HESP)



TRAY VERTICAL ADJUSTABLE SPLICE PLATE (110Ht)
(TPC VESP)

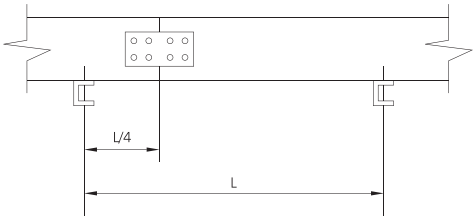
TPC ESP DIMENSIONS			
SPLICE PLATE TYPE	L	A	B
EXPANSION SPLICE PLATE	76	18	40

TPC HESP DIMENSIONS			
SPLICE PLATE TYPE	L	A	B
HORIZONTAL ADJUSTABLE SPLICE PLATE	76	18	40

TPC VESP DIMENSIONS						
SPLICE PLATE TYPE	L	A	B	C	D	E
VERTICAL ADJUSTABLE SPLICE PLATE	76	18	40	75	16	15

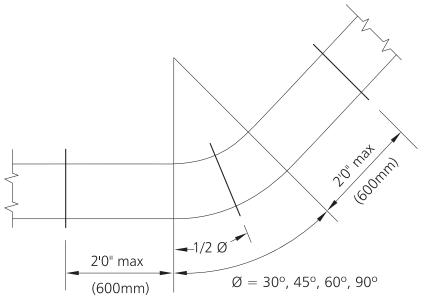
Recommended Support As Per NEMA Standard

SPLICE PLATE LOCATION

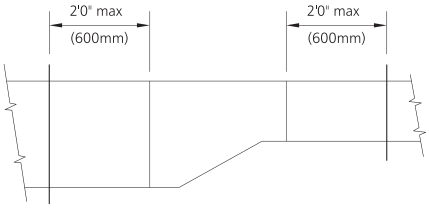


As per NEMA FG1, splice plate is recommended to be located at 1/4 of the span from the support, where the bending moment is zero.

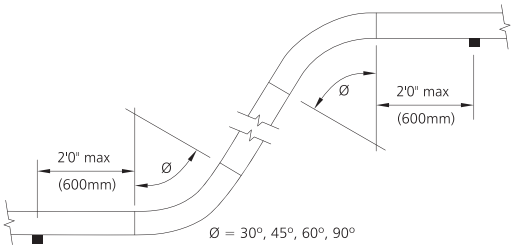
SUPPORT LOCATION



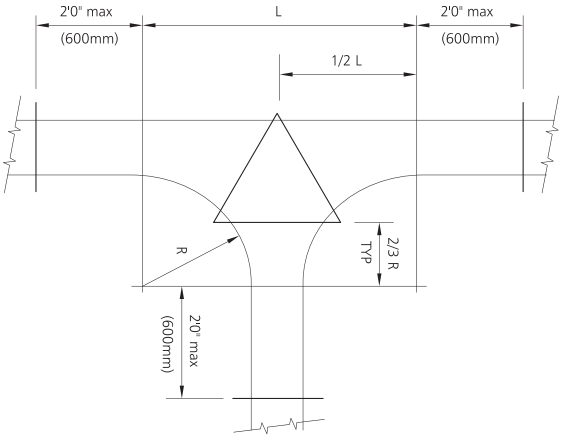
Horizontal Elbows



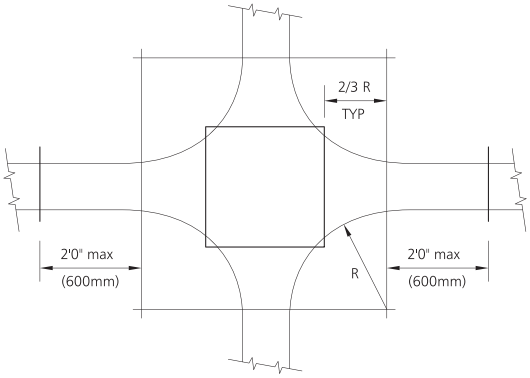
Offset Reducer



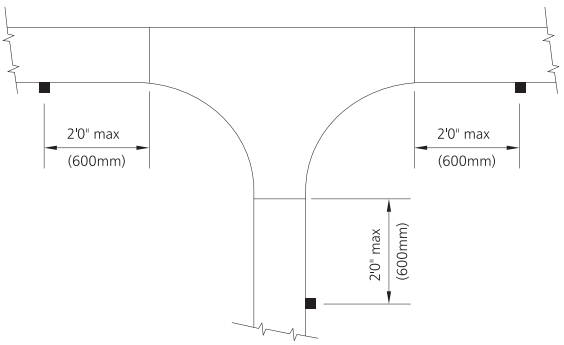
Vertical Elbows



Horizontal Tee



Horizontal Cross



Vertical Tee

Chemical Resistance Data

Up to temperature °C	Vinylester 49°	Vinylester 99°	Isophthalic Polyester 49°	Isophthalic Polyester 99°
Acetaldehyde	R	N	N	N
Acetaldehyde, aq. 40%	N	N	N	N
Acetic Acid, glacial	L	N	N	N
Acetic Acid, 20% (25)	R	R	R	N
Acetic Acid, 80%	R	R	N	N
Acetic Anhydride	L	N	N	N
Acetone, 10%	R	N	N	N
Adipic Acid	R	N		
Alcohol, allyl	N	N	N	N
Alcohol, benzyl	L	N	N	N
Alcohol, butyl (n-butanol)	R	N	N	N
Alcohol, butyl (2-butanol)	R	N	N	N
Alcohol, ethyl	L	N	R	N
Alcohol, hexyl	R	L	N	N
Alcohol, isopropyl (2-propanal)	R	N	N	N
Alcohol, methyl	L	N	L	N
Alcohol, propyl (1-propanaol)	R	N	N	N
Allyl chloride	N	N	N	N
Alum	R	R	R	R
Ammonia, gas	L	N	R	N
Ammonia, liquid	N	N	N	N
Ammonia, aq. 20%	R	N	N	N
Ammonia salts, except fluoride	R	R	R	R
Ammonium fluoride, 25%	R	N	N	N
Amlyl acetate	R	N	N	N
Amyl chloride	R	N	N	N
Aniline	N	N	N	N
Aniline hydrochloride	R	N	N	N
Antimony trichloride			R	N
Aqua regia			N	N
Arsenic Acid, 80%	L	N		N
Aryl-sulfonic acid	R	R	N	N
Barium salts	R	R	R	N
Beet sugar liquor	R	N		
Benzaldehyde, 10%			N	N
Benzaldehyde, 10 - 100%	N	N	N	N
Benzene (Benzoil)	L	N	N	N
Benzene sulfonic acid, 10%	R	R	R	N
Benzene sulfonic acid, 50%	R	N	N	N
Benzonic acid	R	R	R	N
Black liquor - paper	R	R	N	N
Bleach, 12.5% active chlorine	R	N	N	N
Bleach, 5.5% active chlorine	R	N	R	N
Borax	R	R	R	N
Boric Acid	R	N	R	N
Brine	R	N	R	R
Bromic acid, < 50%	R	N		N
Bromine, liquid	N	N	N	N
Bromine, gas 25%	N	N	N	N
Bromine, aq	R	N		
Butane	R	R	R	R
Butanediol (eythriol)	R	R	R	R
Butanediol	R	R	N	N
Butyl Acetate	N	N		
Butyl phenol	N	N	N	N
Butyric acid, < 50%	R	R	N	N
Calsium hypochlorite	R	N	R	N
Calcium hypochlorite	R	N	R	N
Calcium hydroxide, 100%	R	R	R	N
Cane sugar liquors	R	L		
Carbon disulfide	N	N	N	N
Carbon dioxide	R	R	R	N
Carbon dioxide, aq.	R	R	R	R
Carbon monoxide	R	R	R	R
Carbon tetrachloride	R	N	N	N
Casein	R	R	R	R
Castor oil	R	N		
Caustic potash (KOH)	R	N	N	N
Caustic soda (NaOH)	R	N	N	N
Chlorine, gas, dry	R	R	R	N
Chlorine, gas, wet	R	R	N	N
Chlorine, liquid	N	N	N	N
Chlorine, water	R	R	N	N
Chlorocetic acid	R	N	N	N
Chlorobenzene	L	N	N	N
Chloroform	N	N	N	N
Chlorosulfonic acid, 10%	N	N	N	N
Chromic acid, 10%	R	N		
Chromic acid, 30%	N	N	N	N
Chromic acid, 40%	N	N	N	N
Chromic acid, 50%	N	N	N	N
Citric acid	R	R	R	N
Coconut oil	R	R	R	N
Copper salts, aq.	R	R	R	R
Cottonseed oil	R	R	R	R
Cresylic acid, 50%	N	N	N	N

Up to temperature °C	Vinylester 49°	Vinylester 99°	Isophthalic Polyester 49°	Isophthalic Polyester 99°
Cyclohexane	R	N	R	R
Cyclohexanol	R	N	R	N
Cyclohexanone			N	N
Diesel fuels	R	R	R	N
Diethyl amine	N	N	N	N
Dioctyl phthalate	R	R	N	N
Dioxane - 1, 4			N	N
Dimethylamine	N	N	N	N
Dimethyl formamide	N	N	N	N
Detergents, aq	R	R	R	R
Didutylphthalate	R	R	N	N
Didutylsebacate	R	N	R	R
Dichlorobenzene	R	N	N	N
Dichlorethylene	N	N	N	N
Ether (diethyl)	N	N	N	N
Ethyl halides	N	N	N	N
Ethylene halides	N	N	N	N
Ethylene glycol	R	R	R	R
Ethylene oxide	N	N	N	N
Fatty acids	R	R	R	R
Ferric salts	R	R	R	R
Fluorine, gas, dry	N	N	N	N
Fluorine, gas, wet	N	N	N	N
Fluoroboric acid, 25%	R	R	N	N
Fluorosilicic acid, 10%	R	N	N	N
Formaldehyde	R	N	R	N
Formic acid	L	N	N	N
Freon, F11, F12, 113, 114	N	N	N	N
Freon, F21, F22	N	N	N	N
Fruit Juices and pulps	N	N	R	N
Fuel oil	R	R	R	N
Furfural	N	N	N	N
Gas, natural, methane	R	N	R	N
Gasoline	R	L	R	N
Gelatin	R	L	R	N
Glycerine (glycerol)	R	R	R	N
Glycols	R	R	R	R
Glycolic acid	L	N	R	N
Green Liquor - paper	R	N	N	N
Heptane	R	R	R	N
Hexane	R	N	R	N
Hydrobromic acid, 25%	R	N	R	N
Hydrochloric acid	R	R	R	N
Hydrofluoric acid, 10%	R	N	L	N
Hydrofluoric acid, 60%	N	N	N	N
Hydrofluoric acid, 100%	N	N	N	N
Hydrocyanic acid	R	R	N	N
Hydrogen peroxide, 50%			N	N
Hydrogen peroxide, 90%			N	N
Hydrogen sulfide, dry	R	R	R	N
Hydrazine	N	N	N	N
Hypochlorous acid, 10%	R	L	N	N
Jet fuels, JP 4 and JP 5	R	N	N	N
Kerosense	R	N	R	N
Lactic acid, 25%	R	R	R	N
Lauric acid	R	R	R	N
Lauryl chloride	R	R	R	N
Laurlyl sulfate	R	R	R	N
Lead salth	R	R	R	R
Linoleic acid	R	R	R	N
Linseed oil	R	R	R	N
Lithium salth	R	R	R	N
Lubricating oils	R	N	R	N
Machine oil	R	N	R	N
Magnesium salts	R	R	R	R
Maleic acid	R	R	N	N
Manganese sulfate	R	R	R	N
Mercuric salts	R	R	R	N
Mercury	R	R	R	R
Methane	R	R	R	R
Methyl acetate	N	N	N	N
Methyl bromide (gas)	N	N	N	N
Methyl cellosolve			R	N
Methyl chloride	N	N	N	N
Methyl chloroform	N	N	N	N
Methyl cyclohexanone	N	N	N	N
Methyl methacrylate	N	N	N	N
Methylene bromide	N	N	N	N
Methylene chloride	N	N	N	N
Methylene iodide	N	N	N	N
Mineral oil	R	R	R	N
Molasses	R	N	R	N
Monochlorobenzene	L	N	N	N
Monoethanolamine	N	N	N	N
Motor oil	R	R	R	R
Naphtha	R	R	R	N
Napthalene	R	R	R	N
Nickel salts	R	R	R	R
Nitric acid, 0 to 20%	R	N	N	N

Up to temperature °C	Vinylester 49°	Vinylester 99°	Isophthalic Polyester 49°	Isophthalic Polyester 99°
Nitric acid 21 to 100%	N	N	N	N
Nitric acid, fuming	N	N	N	N
Nitrobenzene	L	N	N	N
Nitrous acid	R	N	R	N
Oleic acid	R	R	R	R
Oleum	N	N	N	N
Olive oil	R	R	R	R
Oxalic acid		R	R	R
Ozone, gas, 5%	R	N	N	N
Palmitic acid, 10%	R	R	R	R
Palmitic acid, 70%	R	R	R	R
Paraffin	R	R	R	R
Pentane	R	N	R	N
Perchloric acid, 10%	R	N	N	N
Perchloric acid, 70%	R	N	N	N
Perchloroethylene	R	N	N	N
Petroleum, sour	R	R	R	N
Petroleum, refined	R	R	R	N
Phenol, 88%	N	N	N	N
Phenylcarbinol	N	N	N	N
Phenylhydrazine	N	N	N	N
Phosphoric acid	R	R	R	L
Phosphorous, yellow	N	N	N	N
Phosphorous, red	N	N	N	N
Phosphorous, trichloride	N	N	N	N
Phthalic acid	R	R		
Potassium salts, aq.	R	R	R	R
Potassium permanganate 25%	R	R	R	N
Propane	R	R	R	R
Propylene dichloride	N	N	N	N
Propylene glycol	R	R	R	N
Propylene oxide	N	N		
Pyridine	N	N	N	N
Rayon coagulating bath	R	N	N	N
Sea water	R	R	R	R
Salicylic acid	R	N	R	N
Sewage, residential	R	L	R	N
Silicic acid	R	R	R	N
Silicone oil	R	R	R	R
Silver salts	R	R	R	R
Soaps	R	R	R	R
Sodium hydroxide			N	N
Sodium salts, aq. except	R	R	R	R
Sodium chlorite 10%	R	N		
Sodium chlorate	R	R		
Sodium dichromate, acid	R	R		
Stannic chloride	R	R	R	N
Stannous chloride	R	R	R	R
Stearic acid	R	R	R	R
Sulfite liquor	R	R	R	N
Sulfur	R	R	R	N
Sugars, aq.			R	R
Sulfur dioxide, dry	R	R	R	R
Sulfur dioxide, wet	R	R	R	R
Sulfur trioxide, gas, dry	R	R	N	N
Sulfur trioxide, wet	N	N	N	N
Sulfuric acid, < 26%	R	R	R	N
Sulfuric acid, 26% to 80%	R	N	N	N
Sulfuric acid, 81% to 100%	N	N	N	N
Sulfurous acid, 10%	R	N	N	N
Tall oil	R	R	R	N
Tannic acid	R	R	R	R
Tartaric acid	R	R	R	R
Tetrachloroethane	R	N	N	N
Tetrahydrofuran	N	N	N	N
Thionyl chloride	N	N	N	N
Thread cutting oil	R	N	R	N
Terpineol	R	R	R	R
Toluene	R	N	N	N
Tributyl phosphate	R	N	N	N
Tricresyl phosphate	R	N	N	N
Trichloracetic acid	R	R	N	N
Trichloroethylene	N	N	N	N
Triethanolamine	R	N	N	N
Triethylamine	R	N	N	N
Turpentine	R	R	N	N
Urea, 50%	R	N	R	N
Vaseline	R	R	R	R
Vegetable oils	R	R	R	R
Vinegar	R	R	R	N
Vinyl acetate	N	N	N	N
Water, distilled	R	R	R	N
Water, fresh	R	R	R	R
Water, mine	R	R	R	N
Water, salt	R	N	R	R
Water, tap	R	R	R	R
Whiskey	R	N	R	N
Wines	R	N	R	N
Xylene	R	N	N	N
Zinc salts	R	R	R	R

R=Resistant, N=Not resistant, L=Less resistant than R, but still suitable for some conditions

Comparison of Intech and Subsitude Products

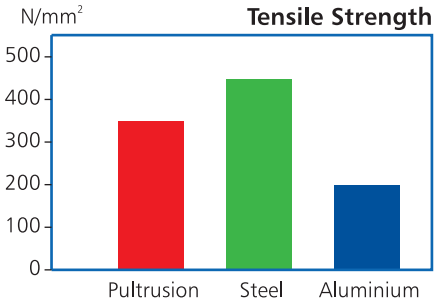
Comparison of Intech Pultruded FRP Products vs others Products

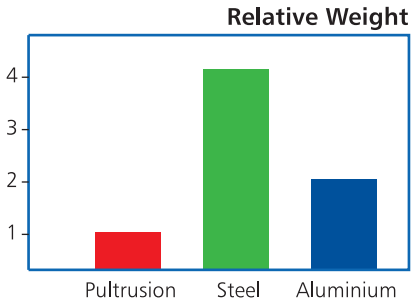
PROPERTY	INTECH Pultruded FRP PRODUCTS	Other FRP PRODUCTS	Mild Steel	Stainless Steel	ALUMINUM PRODUCTS.
Cost Effective	Extremely long life compare to other materials. Maintenance free.	Long life compare to other materials. Maintenance free.	Maintenance required.	Depend on application and grade.	Depend on application.
Flatness & Thickness Consistency	Pultusion is pultruded from heated die, therefore flatness is consistence even cut into smaller sizes. Thickness is even and consistent.	Production of FRP hand-lay products is based on the workmanship and has a high probability of uneven surfaces due to the production process.	Flatness and thickness is even and consistent.	Flatness and thickness is even and consistent.	Flatness and thickness is even and consistent.
Impact Resistance	Continuous strand glass mat in FRP Products distributes the impact load to prevent surface damage even under sub-zero temperature and will not permanently deform and stay flat for the life of the product under closed mold pultrusion processing. High in mechanical strength.	Chopped strand mat used in FRP hand-lay products will probably deform or crack under impact without going under the closed mold processing and pultrusion system. Low in mechanical strength.	Will permanently deform under impact and take a permanent set (dishing in trench application due to overloading). High in mechanical strength.	Will permanently deform under impact and take a permanent set (dishing in trench application due to overloading). High in mechanical strength.	Will permanently deform under impact and take a permanent set (dishing in trench application due to overloading). Low in mechanical strength.
Corrosion Resistant	Corrosion resistant under the most aggressive conditions	Corrosion resistant.	Non-corrosion resistant	Depends on grade. SS304 not recommended in off-shore. SS316 better corrosive resistant.	Corrosion resistant.
Safety	Electrically non-conductive and non-magnetic. Low in thermal conductivity. No sharp edges after cutting.	Electrically non-conductive. Low in thermal conductivity. No sharp edges after cutting.	Conductive. Grounding potential around electrical equipment. High in thermal conductivity. Sharp edges after cutting.	Conductive. Grounding potential around electrical equipment. High in thermal conductivity. Sharp edges after cutting.	Conductive. Grounding potential around electrical equipment. High in thermal conductivity. Sharp edges after cutting.
Fabrication	Produced in light weight and it can be shipped to the site or fabricated and installed on site with simple carpenter tools.	Produced in light weight and it can be shipped to the site or fabricated and installed on site with simple carpenter tools.	Require special blade, torch, and harder to cut it. Sometimes requires more manpower to move and place.	Require special blade, torch, and harder to cut it. Sometimes requires more manpower to move and place.	Require special blade, torch, and harder to cut it. Sometimes requires more manpower to move and place.
Vandalism	Totally no recycle value, and this will not encourage any theft or vandalism.	Totally no recycle value, and this will not encourage any theft or vandalism.	Mild steel products carry good recycle value.	Stainless steel products carry good recycle value.	Aluminum Products carry good recycle value.

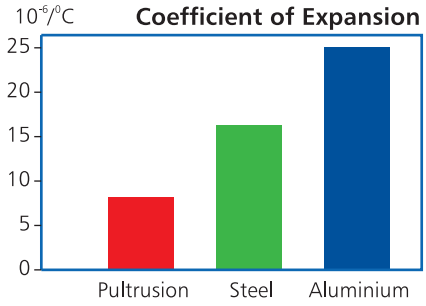
Typical Properties of Pultrusion FRP Products

The information given is a guide to the typical properties of Pultruded Glass Reinforced Plastic sections. The pultruded profiles are made from a combination of continuous Logitudinal Rovings, Continuous Filament Mats and Resin, thus properties will vary depending on reinforcement and resin choice.

COMPARISONS







PROPERTIES

Mechanical:

Tensile Strength, Longitudinal:	250 - 350	N/mm^2
Flexural Stress, Longitudinal:	250 - 350	N/mm^2
Elastic Modulus, Flexural, Longitudinal:	15,000 - 30,000	N/mm^2
Compressive Strength:	150 - 300	N/mm^2
Impact Strength:	1 - 2	kJ/M
Elongation at Rupture	2	%
Hardness (Barcol 934-1):	40 - 60	
Specific Gravity:	1.7 - 1.9	

Electrical:

Dielectric Strength:	12	kV/mm
Volume Resistivity:	10^{10} - 10^{12}	Ω/cm^2

Thermal:

Coefficient of Thermal Expansion:	8 - 10	$10^{-6}/^0K$
Thermal Conductivity:	0.2 - 0.3	$W/^0K.M$
Operating Temperature Range (Resin dependent):	-70 to +120	°C

Fire:

B.S.476	Class 1
ASTM E84	Class A (FSI < 25)
IEC 60695	960°C Max
UL 94	VO

Smoke:

ASTM E662	Ds at 1.5 min = 0.68
ASTM E84	Class A (SDI < 450)

Antistatic (optional)

BS EN 50014	2.27 MΩ

Typical Applications

FRP Cable Ladder & Tray For Chemical Complex

FRP Cable Ladder & Tray For Offshore Platform

FRP Cable Ladder For Gas Processing Plant

FRP Cable Ladder & Tray For Offshore Platform

TYPICAL APPLICATIONS

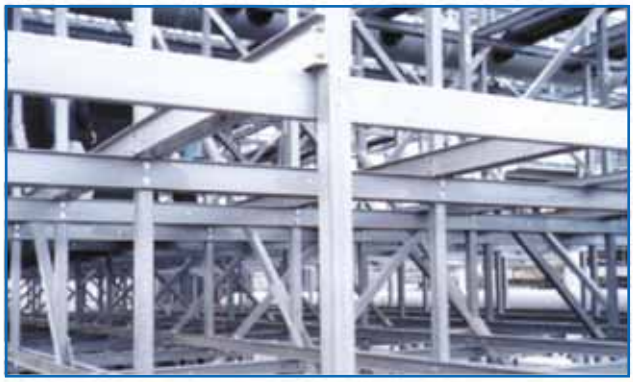
ARGOS FRP products can be used in either new application or for replacing existing application which is exposed to corrosive environment. The application can be found in all type of industrial such as:-

- Offshore and Onshore
- Food
- Power Plants
- Electrical
- Pollution Control
- Water / Waste Treatment
- Recreation
- Public Facilities
- Government Properties
- Oil & Gas
- Chemical
- Marine
- District Cooling System

FRP cable ladder and tray for power station

Applications of other ARGOS FRP Pultruded Products

FRP Grating For Recreation Park (Malaysia)

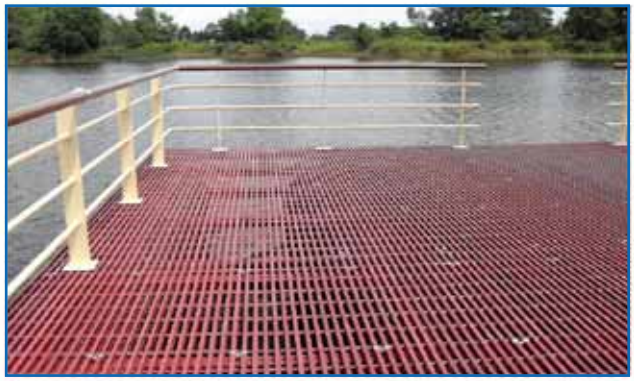


FRP Profiles For Cooling Tower Structure (Singapore)

FRP Grating For Perimeter Drain (Malaysia)

FRP Grating & Handrails For FPSO (Brazil)

FRP Road side grating (Malaysia)



FRP grating used at wetland jetty (Malaysia)

FRP Grating For Chemical Plant (Malaysia)

Installation Of FRP Grating On Offshore Platform (Brunei)

ARGOS FRP - FULL RANGE OF FRP PRODUCTS:

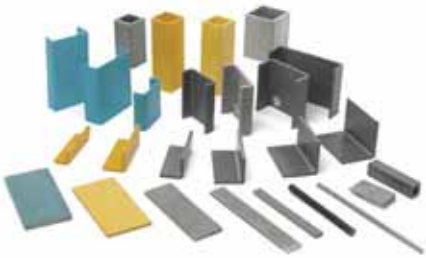
Assisting you to make a better choice from the best for your successful project with ARGOS FRP composite industrial products.

GRATING & STAIRTREAD

CABLE LADDER & CABLE TRAY

INTECH HANDRAIL & CAGED LADDER SYSTEM

STRUCTURAL SUPPORT SYSTEM



STRUCT CHANNEL

OTHER ARCHITECTURAL HAND-LAY UP PRODUCTS

ARGOS FRP PTY LTD
26 HOWE STREET
OSBORNE PARK
WA 6017
AUSTRALIA
info@argosfrp.com.au (or) yokesh@argosfrp.com.au www.argosfrp.com.au
Phone: 08 6363 5894
Mobile: 0438 581 223

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SOLUTIONS FOR CORROSIVE ENVIRONMENTS