



E-LINE KCA GRP CTA GRP

Non-metallic Cable Management System | Pultruded Fiberglass Reinforced Polyester



E-LINE
KCA-CTA GRP



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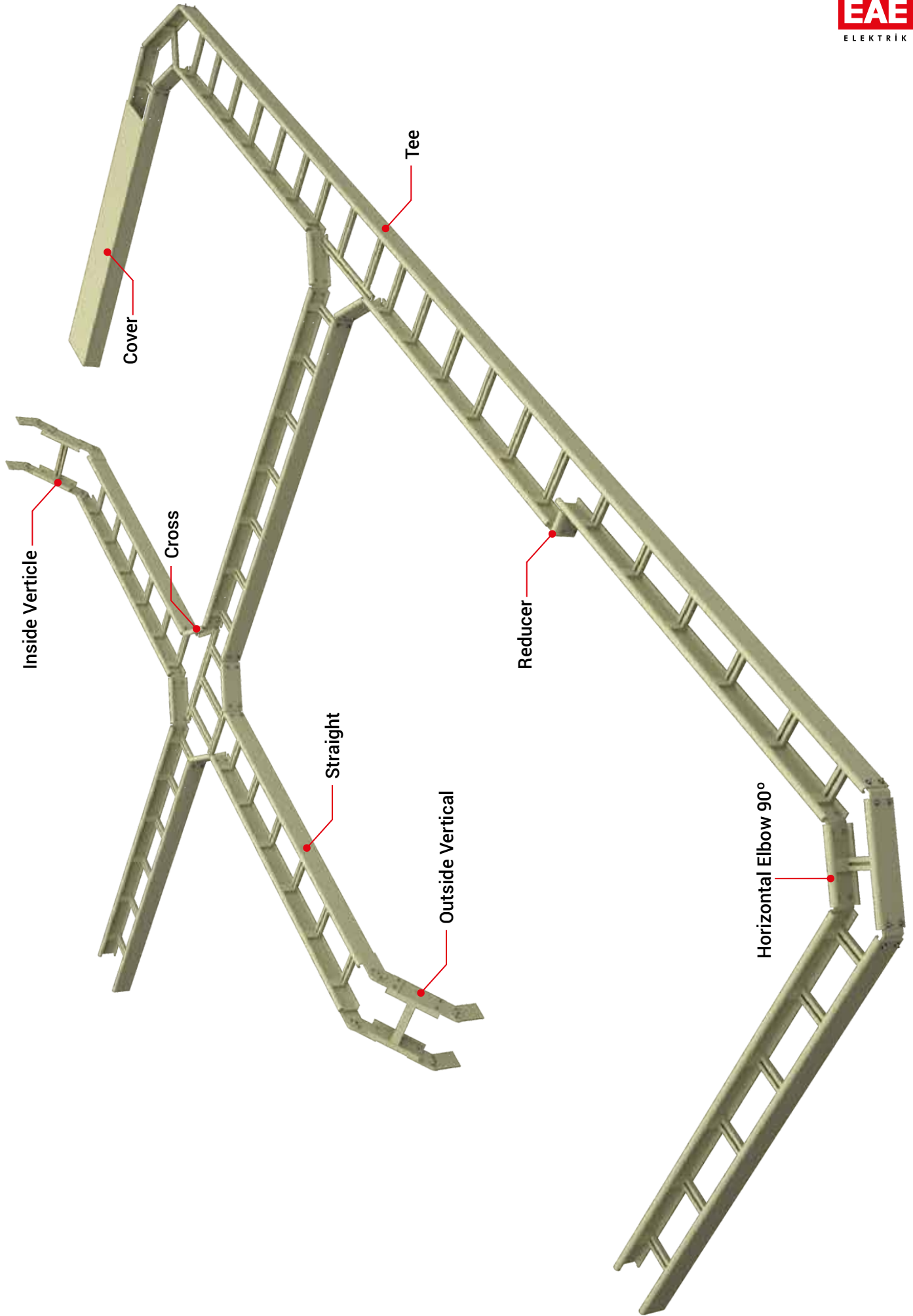
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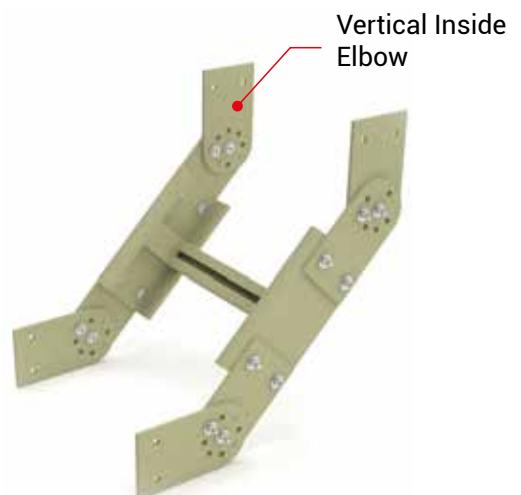
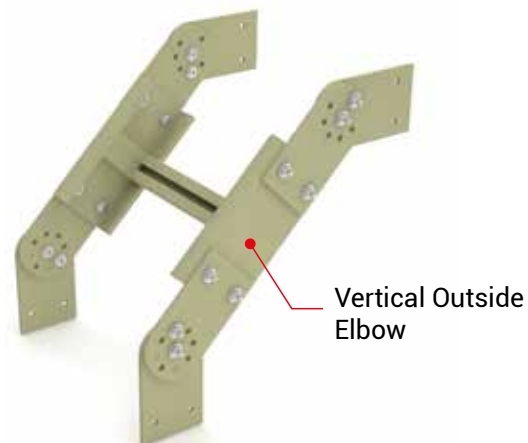
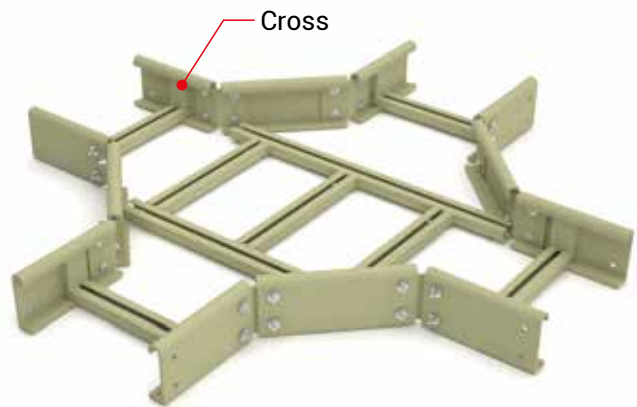
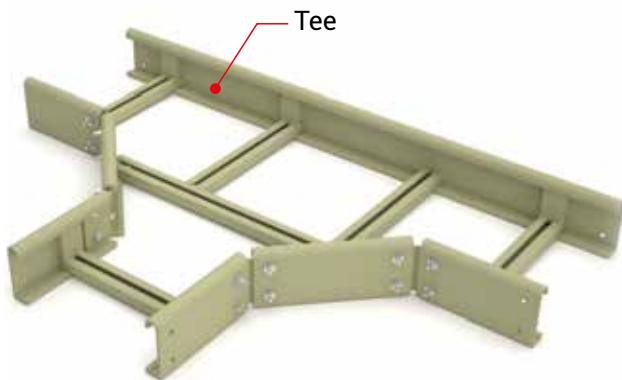
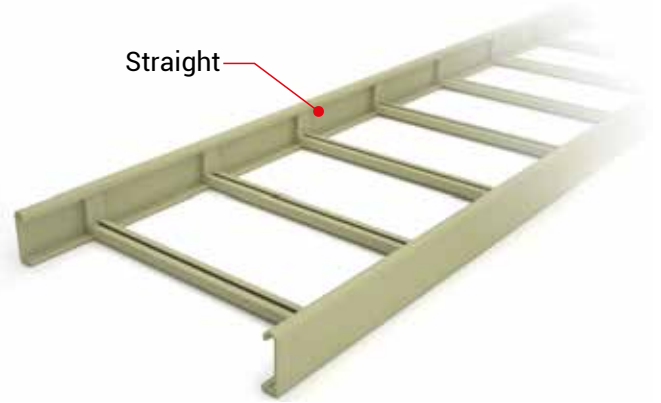
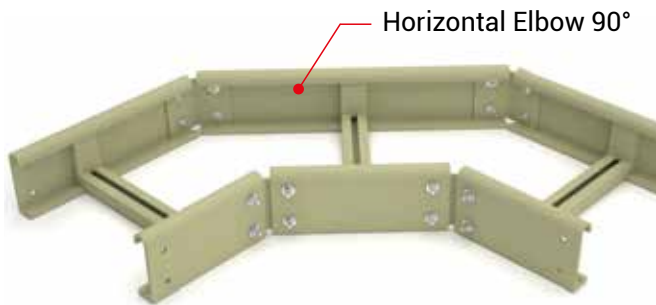
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ADVANTAGES of E-LINE GRP

Engineers, designers, contractors, installers and end users have many reasons to choose E-LINE GRP/FRP cable tray for their power, signal and control distribution support requirements. E-LINE FRP pultrude cable ladder system is well adapted to extremely harsh chemical environments where high-corrosion resistance is required. Pultruded fiberglass Reinforced Polyester material as standard and exhibits below-mentioned performance characteristics.

- Self-extinguishing**
- UV resistance**
- Halogen-free**
- No need to earth**
- Without toxic fumes**

High Chemical Resistance. Chemically resistance for severely corrosive environments. Life-cycle cost is dramatically reduced by the extended life expectancy of this product.

High Weather Resistance. GRP is extremely resistant to low temperatures and exhibits well performance even in harsh climates.

High Mechanical Resistance. Pultruded profiles have been classified and approved NEMA 12°C and NEMA 20°C classification. Pultruded profiles can be supported up to 6M span, which reduce both the number of supports used.

Light-Weight. High strength-to-weight ratio as compared to metallic systems. Density is around. 1,75 gr/cm³ and 40% lighter than conventional metallic systems.

Low-Maintenance Cost. Continuous maintenance and cleaning are eliminated and cost effective-long term solution is provided.

High Dielectric Strength / Insulating. Low electrical conductivity properties and high dielectric strength. Conductivity can be increased upon request by enhancing anti-static properties.

Quick & Easy Installation. E-LINE GRP cable tray is strong and lightweight, allowing durable system to be installed quickly and easily.

Secure for Cables. There are no sharp edges or burrs, long runs of armored cable can be installed with less chance for cable damage. Cable bundles can be laid in the tray from either side.



WIDE RANGE of PRODUCTS

Heights are 100 mm and 150 mm; Widths are from 150 mm up to 900 mm, supplied lengths are 3 Meters and 6 Meters with pre-drilled holes on both edges as standard. Horizontal and vertical fittings can be delivered pre-assembled with radius options 250 mm, 300 mm and 600 mm with pre-drilled holes as standard.

- Available heights: 100 mm, 150 mm
- Available widths: 150 mm, 200 mm, 300 mm, 400 mm, 450 mm, 500 mm, 600 mm, 750 mm, 900 mm
- Rung spacing: 300 mm
- Straight Lengths: 3 Meters / 6 Meters
- Fitting radius: R300-R450-R600
- Covers
- Joint and fixing accessories

APPLICATION AREAS

- Wastewater treatment plant
- Power plants
- Mine industry
- Chemical plants
- Onshore/offshore installations
- Tunnels
- Farms and food production
- Solar and photovoltaic applications

REASONS to CHOOSE COMPOSITES:

1. Resistance to corrosion
2. Extremely light-weight
3. Excellent fire characteristics
4. Excellent load capacity
5. Insulating
6. Long-life span

EXTREME LOAD CAPACITY

- 149 kg/m at 3,6 m single span (NEMA 12C) for H100
- 149 kg/m at 6,0 m single span (NEMA 20C) for H150

WIDE RANGE of PRODUCTS

Standard Delivered Dimensions

- ↔ 150-200-3000-400-450-500-600-750-900 mm as standard
- ↑↓ 100 mm and 150 mm heights as standard
- 3M and 6M length as standard

REASONS to CHOOSE COMPOSITES:

- Under fire conditions
- Non-flammable material (Class I – ASTM E84)
- Self-extinguishing (UL 94 "V0" Classified)
- No toxic fumes
- Zero halogen
- Low flame spread index
- Low smoke densit



INSULATING

- Extremely insulating material (>7kV/m)
- No need to earth

MAINTANANCE FREE

- No corrosion
- No electrolytic corrosion
- No need for painting and protective varnishes

CODES & STANDARDS & CERTIFICATES (Con't)

EAE ELEKTRIK has carried out third party laboratory tests on all range of KCA GRP products. Details and results of the test is published and could be seen below. Please contact us for more support about test requirements.

UL 94 V-0 / (ASTM D-635) UL 94 V-0 / (ASTM D-635): Flammability Test

Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances:

That is a standard test method for measuring the rate of burning and duration of burning in plastic products. Our KCA GRP material self-extinguished within 10 seconds which means product achieved UL94 V-0 certification.

IEC 60695-2: Glow Wire Test

Glowing/hot-wire based test methods-Glow-wire flammability test method for end-products (GWEPT):

The sample is intended to simulate effects of thermal stress produced by an electrically heated source to represent a fire hazard. Our material achieved to resist a hot with 950 oC which is the highest possible value.

BS 476 Part-7: Surface Flammability

Standard Flammability Testing Equipment Surface Flame Spread Apparatus

This is a vertical flame spread test. Sample material is exposed to a high intensity flame for a predetermined amount of time. The heat source is then removed, and the test begins, after 10 minutes the flame spread, and rate is measured. Our resin system achieved the highest level possible.

ASTM E84: Surface Burning Characteristics

Standard Test Method for Surface Burning Characteristics of Building Materials:

Tests determine the rate of flame spread and smoke emission index of materials. The material is placed in a test box with a gas burner at one end and a smoke measurement device at the exhaust end. Our KCA GRP material achieved the highest level of certification in this test. Class-1.

ISO 4589-2: LIMITING OXYGEN INDEX

Determination of burning behavior by oxygen index:

specifies methods for determining the minimum volume fraction of oxygen, in admixture with nitrogen, that will support combustion of small vertical test specimens under specified test conditions. The results are defined as oxygen index (OI) values. Our KCA GRP system has achieved 23% (OI)

DIN 4102-1: Fire behavior of Building Elements

Fire behavior of building materials and elements Part 1: Classification of building materials requirements and testing

A test specimen is hung vertically in a test cabinet with a burner in it. It is subjected simultaneously to a flame for 10 minutes and a constant flow of air from below. The temperature of the smoke and the undamaged length of the specimen are measured.

IEC 60754-1: HALOGEN-FREE

Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content

Specifies the apparatus and procedure for the determination of the amount of halogen acid gas, The method specified in this standard is intended for the testing of individual components used in a cable construction. A simple test that ensures the material has zero halogen content. Halogens are a toxic group of elements that are sometimes used as flame retardants. All our products are halogen free.

ISO 527: TENSILE TEST

Tensile Strength and Elastic Modulus Testing:

The methods are used to investigate the tensile behavior of the test specimens and for determining the tensile strength, tensile modulus and other aspects of the tensile stress/strain relationship under the conditions defined. EAE KCA GRP Cable ladder has 325 MPa tensile strength.

CODES & STANDARDS & CERTIFICATES (Con't)

EAE ELEKTRIK has carried out third party laboratory tests on all range of KCA GRP products. Details and results of the test is published and could be seen below. Please contact us for more support about test requirements.

EN 60068-2-75: IMPACT TEST

Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests

It is used to demonstrate an acceptable level of robustness when assessing the safety of a product and is primarily intended for the testing of electrotechnical items. EAE KCA GRP Cable ladder is classified 10J impact resistance.

ISO 4892-2: UV TEST

Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps

ISO 4892-2:2013 specifies methods for exposing specimens to xenon-arc light in the presence of moisture to reproduce the weathering effects (temperature, humidity and/or wetting) that occur when materials are exposed in actual end-use environments to daylight or to daylight filtered through window glass.

NEMA FG-1: Single-Span Load Test

According to single-span, single-straight product load test, EAE KCA GRP Cable Ladder straight lengths are classified 12C and 20C.

IEC 61537: Multi-span Load Test

According to multi-span, spliced two straight product load tests, load capacity vs. span is drawn and could be seen on related straight length catalog pages.

IEC 60079-0 / (ASTM D-257): Surface resistivity (Anti-static property)

Explosive atmospheres - Part 0: Equipment - General requirements

specifies the general requirements for construction, testing and marking of Ex Equipment and Ex Components intended for use in explosive atmospheres. EAE KCA GRP Cable ladder is highly insulating material that has $>10^{12}$ ohm, which can be enhanced to $<10^8$ ohm with additional carbon filler.

IEC 60243-1/ (ASTM D-149): Dielectric Strength

Electrical strength of insulating materials – Test methods Part 1: Test at power frequencies

provides test methods for the determination of short-time electric strength of solid insulating materials. EAE KCA GRP Cable ladder has 7,2 kV/mm dielectric strength with 39 kV breaking voltage which is satisfied result.

IEC 60112: Proof Tracking Index

Method for the determination of the proof and the comparative tracking indices of solid insulating materials

provides test methods for the determination of short-time electric strength of solid insulating materials. EAE KCA GRP Cable ladder has 7,2 kV/mm dielectric strength with 39 kV breaking voltage which is satisfied result.

MATERIAL TECHNICAL DATASHEET (Glassfiber Reinforced Polyester Resin)

E-Line KCA GRP/GRP Fiberglass Cable Ladder systems are manufactured from glass fiber-reinforced plastic shapes that meet ASTM E-84 / UL 723, Class 1 Flame Rating and self-extinguishing requirements of ASTM D-635/ UL 94 V0. A surface veil is applied during pultrusion to insure a resin-rich surface and ultraviolet resistance.

The cable trays and accessories comply with the requirements of latest revision of following standards:

TECHNICAL DATA SHEET / POLYESTER RESIN / HALOGEN-FREE / RAL 7032			
PROPERTIES	TEST METHOD	RESULT / VALUE	COUNTRY
FIRE BEHAVIOUR			
Flammability	UL 94 / (ASTM D-635)	UL 94 - V0	TR
Flammability	IEC 60695-2-11 (GWT: Glow Wire test)	960°C	TR/FR
Flammability & Smoke Index	NF F 16-101	I0 / F0 (Dm: 239 / VOF4: 30) (accord. NF X 10-702) (ITC: 2.18) (accord. NF X 70-100)	FR
Flame Spread & Smoke developed index	ASTM E-84 / UL 723	Class-1 (FSI Flame Spread Index:15) (SD: Smoke Density:250)	TR
Flammability	BS 476 Part-7	Class-1	TR
Fire Behavior	DIN 4102-1	B1	TR
Halogen Content	IEC 60754-1	Halogen-free	TR
Limiting Oxygen Index	ISO 4589-2 / (ASTM D-2863)	28% (>45% upon request)	TR/FR
Fire Behavior	EN 45545-2 Fire Behavior of Railway vehicles, Number: R6 ISO 5660-1: Parameter MARHE EN ISO 5659-2: Parameter DS (4) EN ISO 5659-2: Parameter VOF4 EN ISO 5659-2: Parameter CITG	42,97 116,48 172,91 0,79	TR
MECHANICAL BEHAVIOUR			
Tensile Strength	ISO 527 / (ASTM D-638)	325 Mpa	TR
Accelerated Aging Test by UV exposure	ISO 4892-2 / (ASTM G-154)	Good mechanical and chromatic behavior	TR
Impact Resistance	EN 60068-2-75	10 J	TR
Load Capacity	NEMA FG-1	12C (149 kg/m on 3,6 Meters span) 20C (149 kg/m on 6,0 Meters span)	TR
ELECTRICAL BEHAVIOUR			
Surface Resistivity		>1012Ω(<109 Ω FRP with anti-static properties)	TR
Dielectric Strength (Breaking Voltage)		7,2 kV/mm	TR
Proof Tracking Index		575 V	TR
PHYSICAL BEHAVIOUR			
Density	ISO 1183 / (ASTM D-1505)	1,73 gr/cm3	TR
Water Absorption	ISO 62 / (ASTM D-570)	0,28% max	TR
Coefficient of Thermal Expansion	ISO 11359-2 / (ASTM D-696)	10 x 10 ⁻⁶ cm/cm/K	TR



GRP Typical Coupon Properties

Coupon tests are performed in accordance with designed ASTM Tests.

Mechanical Properties	ASTM	UNITS	VALUE (PE)	UNITS	VALUE
Tensile Strength, LW	D-638	psi	30,000	Mpa	206
Tensile Strength, CW	D-638	psi	7,000	MPa	48
Tensile Modulus, LW	D-638	106 psi	2.5	GPa	17
Tensile Modulus, CW	D-638	106 psi	0.8	GPa	5
Compressive Strength, LW	D-695	psi	30,000	MPa	206
Compressive Strength, CW	D-695	psi	15,000	MPa	103
Compressive Modulus, LW	D-695	106 psi	2.5	GPa	17
Compressive Modulus, CW	D-695	106 psi	1.0	GPa	0.6
Flexural Strength, LW	D-790	psi	30,000	MPa	206
Flexural Strength, CW	D-790	psi	10,000	MPa	102
Flexural Modulus, LW	D-790	106 psi	1.8	GPa	11
Flexural Modulus, CW	D-790	106 psi	0.8	GPa	5
Modulus of Elasticity, E	Full Section	106 psi	2.8	Gpa	17
Shear Modulus	-----	106 psi	0.450		
Short Beam Shear	D-2344	psi	4,500		
Punch Shear	D-732	psi	10,000		
Bearing Strength, LW	D-953	psi	30,000		
Notched Izod Impact, LW	D-256	ft-lbs./in	25		
Notched Izod Impact, CW	D-256	ft-lbs./in	4		
Physical Properties	ASTM	UNITS	VALUE (PE)		
Barcol Hardness	D-2583	-----	45		
24 Hour Water Absorption	D-570	% max	0.45		
Density	D-792	lbs./in ³	.062-0.70		
Coefficient of Thermal Expansion, LW	D-696	10 ⁻⁶ in/in/°C	8		
Electrical Properties	ASTM	UNITS	VALUE (PE)		
Electrical Properties	ASTM	UNITS	VALUE		
Arc Resistance, LW	D-495	seconds	120		
Dielectric Strength, LW	D-149	kV/in	35		
Dielectric Strength, PF	D-149	volts/mil	200		
Dielectric Constant, PF	D-150	@60hz	5		

LW = Lengthwise

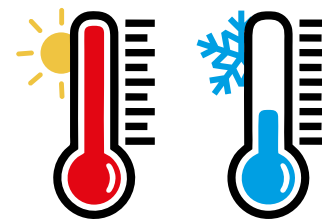
CW = Crosswise

PF = Perpendicular to Laminate Face

EFFECT of TEMPERATURE on Strength

Strength properties of reinforced plastics are reduced when continuously exposed to elevated temperatures. Working loads shall be reduced based on the following:

TEMPERATURE		Polyester Resin %of Strength	Vinyl Ester %of Strength
(°F)	(°C)		
75	24	100 %	100 %
100	38	90 %	100 %
125	52	78 %	100 %
150	65	68 %	90 %
175	79	60 %	90 %
200	94	52 %	70 %



*Freezing temperatures do not effect the load rating of cable ladders and the cable management system as the FRP material does not become fragile. Special consideration is required when service temperatures are over 200° Fahrenheit / 94° Celsius.

THERMAL EXPANSION & CONTRACTION

Strength properties of reinforced plastics are reduced when continuously exposed to elevated temperatures. Working loads shall be reduced based on the following:

Temperature Differential		Max. distance between expansion connector For 1 in. (25mm) expansion	
(°F)	(°C)	(feet)	meters
25	14	667	203
50	28	333	101
75	42	222	67
100	56	167	50
125	70	133	40
150	83	111	33
175	97	95	28

CORROSION GUIDE – Chemical Exposure Chart

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max. Wt. %	Max. Oper. Temp. F (C)	Max. Wt. %	Max. Oper. Temp. F (C)
Acetic Acid	10	190 (88)	10	210 (99)
Acetic Acid	50	125 (52)	50	180 (82)
Acetone	N/R	N/R	100	75 (24)
Aluminum Chloride	SAT	170 (77)	SAT	200 (93)
Aluminum Hydroxide	SAT	160 (71)	SAT	170 (77)
Aluminum Nitrate	SAT	150 (66)	SAT	170 (77)
Aluminum Sulfate	SAT	180 (82)	SAT	200 (93)
Ammonium Chloride	SAT	170 (77)	SAT	190 (88)
Ammonium Hydroxide	1	100 (38)	10	150 (66)
Ammonium Hydroxide	28	N/R	28	100 (38)
Ammonium Carbonate	N/R	N/R	SAT	150 (66)
Ammonium Bicarbonate	15	125 (52)	SAT	130 (54)
Ammonium Nitrate	SAT	160 (71)	SAT	190 (88)
Ammonium Persulfate	SAT	N/R	SAT	150 (66)
Ammonium Sulfate	SAT	170 877)	SAT	200 (93)
Amyl Alcohol	ALL	N/R	ALL	90 (32)
Amyl Alcohol Vapor	-	140 (60)	-	120 (49)
Benzene	N/R	N/R	100	140 (60)
Benzene Sulfonic Acid	25	110 (43)	SAT	200 (93)
Benzoic Acid	SAT	150 (66)	SAT	200 (93)
Benzoyl Alcohol	100	N/R	100	N/R
Borax	SAT	170 (77)	SAT	200 (93)
Calcium Carbonate	SAT	170 (77)	SAT	200 (93)
Calcium Chloride	SAT	170 (77)	SAT	200 (93)
Calcium Hydroxide	25	70 (21)	25	165 (74)
Calcium Nitrate	SAT	180 (82)	SAT	200 (93)
Calcium Sulfate	SAT	180 (82)	SAT	200 (93)
Carbon Disulfide	N/R	N/R	N/R	N/R
Carbonic Acid	SAT	130 (54)	SAT	180 (82)
Carbon Dioxide Gas	-	200 (93)	-	200 (93)
Carbon Monoxide Gas	-	200 (93)	-	200 (93)
Carbon Tetrachloride	N/R	N/R	100	75 (24)
Chlorine, Dry Gas	-	140 (60)	-	170 877)
Chlorine, Wet Gas	-	N/R	-	180 (82)
Chlorine Water	SAT	80 (27)	SAT	180 (82)
Chromic Acid	5	70 (21)	10	120 (49)
Citric Acid	SAT	170 (77)	SAT	200 (93)
Copper Chloride	SAT	170 (77)	SAT	200 (93)
Copper Nitrate	SAT	170 (77)	SAT	200 (93)

SAT: Saturated
N/R: Not Recommended

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max. Wt. %	Max. Oper. Temp. F (C)	Max. Wt. %	Max. Oper. Temp. F (C)
Crude Oil, Sour	100	170 (77)	100	200 (93)
Cyclohexane	N/R	N/R	N/R	N/R
Cyclohexane, Vapor	ALL	100 (38)	ALL	130 (54)
Diesel Fuel	100	160 (71)	100	180 (82)
Diethyl Ether	N/R	N/R	N/R	N/R
Dimethyl Phthalate	N/R	N/R	N/R	N/R
Ethanol	50	75 (24)	50	90 (32)
Ethyl Acetate	N/R	N/R	N/R	N/R
Ethylene Chloride	N/R	N/R	N/R	N/R
Ethylene Glycol	100	90 (32)	100	200 (93)
Fatty Acids	SAT	180 (82)	SAT	200 (93)
Ferric Chloride	SAT	170 (77)	SAT	200 (93)
Ferric Nitrate	SAT	170 (77)	SAT	200 (93)
Ferric Sulfate	SAT	170 (77)	SAT	200 (93)
Ferrous Chloride	SAT	170 (77)	SAT	200 (93)
Fluoboric Acid	N/R	N/R	SAT	165 (74)
Fluosilicic Acid	N/R	N/R	SAT	70 (21)
Formaldehyde	50	75 (24)	50	100 (38)
Formic Acid	N/R	N/R	50	100 (38)
Gasoline	100	80 (27)	100	150 (66)
Glucose	100	170 (77)	100	200 (93)
Glycerine	100	150 (66)	100	200 (93)
Heptane	100	110 (43)	100	200 (93)
Hexane	100	90 (32)	100	130 (54)
Hydrobromic Acid	50	120 (49)	50	120 (49)
Hydrochloric Acid	10	150 (66)	10	200 (93)
Hydrochloric Acid	20	140 (60)	20	190 (88)
Hydrochloric Acid	37	75 (24)	37	95 (35)
Hydrochloric Acid	N/R	N/R	15	80 (27)
Hydrogen Bromide, Dry	100	190 (88)	100	200 (93)
Hydrogen Bromide, Wet	100	75 (24)	100	130 (54)
Hydrogen Chloride	-	120 (49)	-	200 (93)
Hydrogen Peroxide	5	100 (38)	30	100 (38)
Hydrogen Sulfide, Dry	100	170 (77)	100	210 (99)
Hydrogen Sulfide, Wet	100	170 (77)	100	210 (99)
Hypochlorous Acid	20	80 (27)	20	150 (66)
Isopropyl Alcohol	N/R	N/R	15	80 (27)
Kerosene	100	140 (60)	100	80 (27)
Lactic Acid	SAT	170 (77)	SAT	200 (93)

CORROSION GUIDE – Cont'

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max. Wt. %	Max. Oper. Temp. F (C)	Max. Wt. %	Max. Oper. Temp. F (C)
Lead Acetate	SAT	170 (77)	SAT	200 (93)
Lead Chloride	SAT	140 (60)	SAT	200 (93)
Lead Nitrate	SAT	-	SAT	200 (93)
Linseed Oil	100	150 (66)	100	190 (88)
Lithium Chloride	SAT	150 (66)	SAT	190 (88)
Magnesium Carbonate	SAT	140 (60)	SAT	170 (77)
Magnesium Chloride	SAT	170 (77)	SAT	200 (93)
Magnesium Hydroxide	SAT	150 (66)	SAT	190 (88)
Magnesium Nitrate	SAT	140 (60)	SAT	180 (82)
Magnesium Sulfate	SAT	170 (77)	SAT	190 (88)
Mercuric Chloride	SAT	150 (66)	SAT	190 (88)
Mercurous Chloride	SAT	140 (60)	SAT	180 (82)
Methyl Ethyl ketone	N/R	N/R	N/R	N/R
Mineral Oils	100	170 (77)	100	200 (93)
Monochlorobenzene	N/R	N/R	N/R	N/R
Naphtha	100	140 (60)	100	170 (77)
Nickel Chloride	SAT	170 (77)	SAT	200 (93)
Nickel Nitrate	SAT	170 (77)	SAT	200 (93)
Nickel Sulfate	SAT	170 (77)	SAT	200 (93)
Nitric Acid	5	140 (60)	5	150 (66)
Nitric Acid	20	70 (21)	20	100 (38)
Oleic Acid	100	170 (77)	100	90 (32)
Oxalic Acid	ALL	75 (24)	ALL	120 (49)
Paper Mill Liquors	-	100 (38)	-	120 (49)
Perchloroethylene	100	N/R	100	N/R
Perchloric Acid	N/R	N/R	10	150 (66)
Perchloric Acid	N/R	N/R	30	80 (27)
Phosphoric Acid	10	160 (71)	10	200 (93)
Phosphoric Acid	100	120 (49)	100	200 (93)
Potassium Alum. Sulfate	SAT	170 (77)	SAT	200 (93)
Potassium Bicarbonate	50	80 (27)	50	140 (60)
Potassium Bichromate	SAT	170 (77)	SAT	200 (93)
Potassium Carbonate	10	N/R	10	120 (49)
Potassium Chloride	SAT	170 (77)	SAT	200 (93)
Potassium Hydroxide	N/R	N/R	25	150 (66)
Potassium Nitrate	SAT	170 (77)	SAT	200 (93)
Potassium Permanganate	100	80 (27)	100	210 (99)
Potassium Sulfate	SAT	170 (77)	SAT	200 (93)
Propylene Glycol	ALL	170 (77)	ALL	200 (93)

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max. Wt. %	Max. Oper. Temp. F (C)	Max. Wt. %	Max. Oper. Temp. F (C)
Phthalic Acid	-	-	SAT	200 (93)
Sodium Acetate	SAT	160 (71)	SAT	200 (93)
Sodium Benzoate	SAT	170 (77)	SAT	200 (93)
Sodium Bicarbonate	SAT	160 (71)	SAT	175 (79)
Sodium Bisulfate	ALL	170 (77)	ALL	200 (93)
Sodium Bromide	ALL	170 (77)	ALL	200 (93)
Sodium Carbonate	10	80 (27)	35	160 (71)
Sodium Chloride	SAT	170 (77)	SAT	200 (93)
Sodium Cyanide	SAT	170 (77)	SAT	200 (93)
Sodium Hydroxide	N/R	N/R	50	150 (66)
Sodium Hydroxide	N/R	N/R	25	80 (27)
Sodium Hypochloride	N/R	N/R	10	150 (66)
Sodium Monophosphate	SAT	170 (77)	SAT	200 (93)
Sodium Nitrate	SAT	170 (77)	SAT	200 (93)
Sodium Sulfate	SAT	170 (77)	SAT	200 (93)
Sodium Thiosulfate	ALL	100 (38)	ALL	120 (49)
Stannic Chloride	SAT	160 (71)	SAT	190 (88)
Styrene	N/R	N/R	N/R	N/R
Sulfated Detergent	0/50	170 (77)	0/50	200 (93)
Sulfur Dioxide	100	80 (27)	100	200 (93)
Sulfur Trioxide	100	80 (27)	100	200 (93)
Sulfuric Acid	93	N/R	93	N/R
Sulfuric Acid	50	N/R	50	180 (82)
Sulfuric Acid	25	75 (24)	25	190 (88)
Sulfurous Acid	SAT	80 (27)	N/R	N/R
Tartaric Acid	SAT	170 (77)	SAT	200 (93)
Tetrachloroethylene	N/R	N/R	FUM	75 (24)
Toluene	N/R	N/R	N/R	N/R
Trisodium Phosphate	N/R	N/R	SAT	175 (79)
Urea	SAT	130 (54)	SAT	140 (60)
Vinegar	100	170 (77)	100	200 (93)
Water, Distilled	100	170 (77)	100	190 (88)
Water, Tap	100	170 (77)	100	190 (88)
Water, Sea	SAT	170 (77)	SAT	190 (88)
Xylene	N/R	N/R	N/R	N/R
Zinc Chloride	SAT	170 (77)	SAT	200 (93)
Zinc Nitrate	SAT	170 (77)	SAT	200 (93)
Zinc Sulfate	SAT	170 (77)	SAT	200 (93)

SAT: Saturated
N/R: Not Recommended

MECHANICAL LOADING SPECIFICATIONS

NEMA FG-1 is a U.S.A. / CANADA based testing standard of non-metallic cable ladders. Specification occurs with a combination of numeric and alphabetic scales. Single cable ladder is lay on two supports with a distance of L, then loaded until collapse (kg). The load is than divided to 1,5 safety factor and safe working load is noted as kg/m at tested support span.

Numeric refers to span distance in Imperial units;

- 8 ft. (2,4 meters)
- 10 ft. (3,0 meters)
- 12 ft. (3,6 meters)
- 16 ft. (4,8 meters)
- 20 ft. (6,0 meters)

Alphabetic scales refer to safe working load;

- A (75kg/m)
- B (111 kg/m)
- C (149 kg/m)

12C: Safe working load of 149 kg/m with 3,6 meters support span

20C: Safe working load of 149 kg/m with 6,0 meters support span

NEMA FG-1 SPAN/LOAD CLAS DESIGNATION - USA

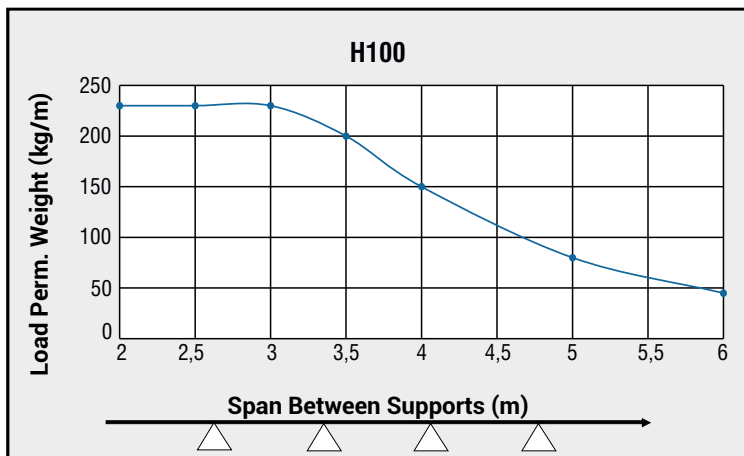
LOAD Kg/m (lb./ft.)	Support Span				
	2,4 m (8 ft.)	2,4 m (8 ft.)	3,6 m (12 ft.)	4,8 m (16 ft.)	6,0 m (20 ft.)
74 (50)	8A	10A	12A	16A	20A
112 (75)	8B	10B	12B	16B	20B
149 (100)	8C	10C	12C	16C	20C

IEC 61537 is an international testing standard of non-metallic cable trays ladders. Two runs of Cable ladder are joint and lay on at least three supports with a distance L and unsupported cantilever span 0,4L, then loaded until deflection limit L/100 reached. Loading is continued up to 1,7 safety factor. Then, the load capacity is noted as kg/m at tested support span.

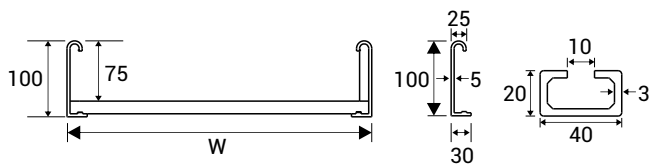
NEMA FG-1	IEC 61537
<ul style="list-style-type: none"> ·Uniformly Distributed Load ·Single-span configuration ·Loading Until Collapse ·x1,5 Safety Factor ·No Splice Plate Usage 	<ul style="list-style-type: none"> ·Uniformly Distributed Load ·Multi-span configuration ·Loading Until Deflection Limit (max. L/100) ·x1,7 Safety Factor ·Splice Plate is used

100 GRP NEMA 12C Series GLASS REINFORCED POLYESTER Cable Ladder

- Side Rail Height (H) : 100mm
- Widths (W) : 150mm, 200mm, 300mm, 400mm, 450mm, 500mm, 600mm, 750mm, 900mm
- Standard Rung Spacing : 300mm
- Standard Lengths (L) : 3 meter/6 meter



- Safe working load values are based on continuous beam test according to IEC 61537 standard.
- Please check Page-10 for effect of temperature on strength.

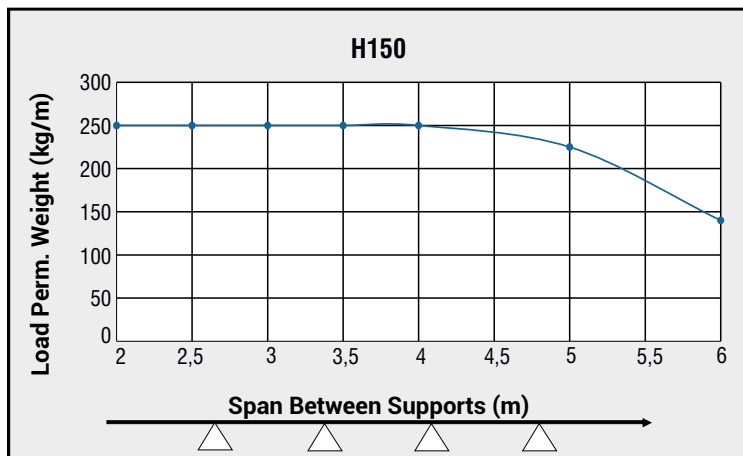


3M Length		6M Length		Height (mm)	Width (mm)	Thickness (mm)	Weight (mm)
Code	Description	Code	Description				
3177379	100 KCA GRP 150 / 3M	3203076	100 KCA GRP 150 / 6M	100	150	5	3,16
3177380	100 KCA GRP 200 / 3M	3203077	100 KCA GRP 200 / 6M	100	200	5	3,24
3177381	100 KCA GRP 300 / 3M	3203078	100 KCA GRP 300 / 6M	100	300	5	3,42
3177382	100 KCA GRP 400 / 3M	3203079	100 KCA GRP 400 / 6M	100	400	5	3,59
3177383	100 KCA GRP 450 / 3M	3203080	100 KCA GRP 450 / 6M	100	450	5	3,68
3177384	100 KCA GRP 500 / 3M	3203081	100 KCA GRP 500 / 6M	100	500	5	3,78
3177385	100 KCA GRP 600 / 3M	3203082	100 KCA GRP 600 / 6M	100	600	5	3,94
3177386	100 KCA GRP 750 / 3M	3203083	100 KCA GRP 750 / 6M	100	750	5	4,21
3177387	100 KCA GRP 900 / 3M	3203084	100 KCA GRP 900 / 6M	100	900	5	4,47

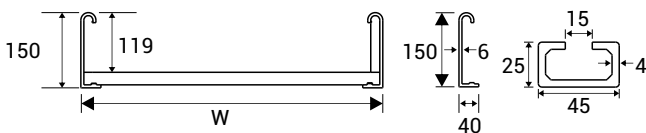
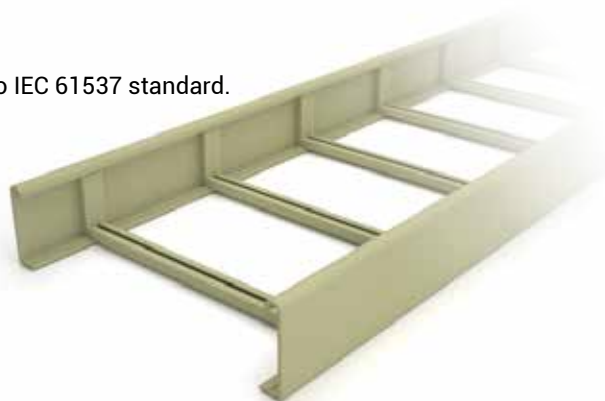
- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Rung spacing** : 300 mm as standard. (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available upon request. Page-36-37)
- **Fasteners** : 4 sets M8x25 SS316 (Page-42)
- **Covers** : Available upon request (Page-27)

150 GRP NEMA 20C Series GLASS REINFORCED POLYESTER Cable Ladder

- Side Rail Height (H) : 150mm
- Widths (W) : 150mm, 200mm, 300mm, 400mm, 450mm, 500mm, 600mm, 750mm, 900mm
- Standard Rung Spacing: 300mm
- Standard Lengths (L) : 3 meter/6 meter



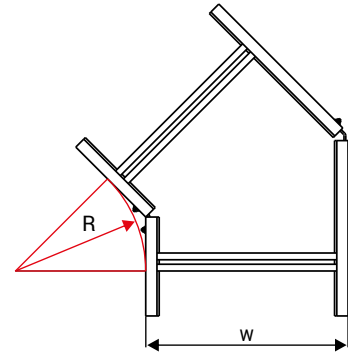
- Safe working load values are based on continuous beam test according to IEC 61537 standard.
- Please check Page-10 for effect of temperature on strength.



3M Length		6M Length		Height	Width	Thickness	Weight
Code	Description	Code	Description	(mm)	(mm)	(mm)	(mm)
3177388	150 KCA GRP 150 / 3M	3203085	150 KCA GRP 150 / 6M	150	150	6	5,38
3177389	150 KCA GRP 200 / 3M	3203086	150 KCA GRP 200 / 6M	150	200	6	5,51
3177390	150 KCA GRP 300 / 3M	3203087	150 KCA GRP 300 / 6M	150	300	6	5,77
3177391	150 KCA GRP 400 / 3M	3203088	150 KCA GRP 400 / 6M	150	400	6	6,31
3177392	150 KCA GRP 450 / 3M	3203089	150 KCA GRP 450 / 6M	150	450	6	6,17
3177393	150 KCA GRP 500 / 3M	3203090	150 KCA GRP 500 / 6M	150	500	6	6,28
3177394	150 KCA GRP 600 / 3M	3203091	150 KCA GRP 600 / 6M	150	600	6	6,56
3177395	150 KCA GRP 750 / 3M	3203092	150 KCA GRP 750 / 6M	150	750	6	6,96
3177396	150 KCA GRP 900 / 3M	3203093	150 KCA GRP 900 / 6M	150	900	6	7,35

- Material : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- Color : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- Rung spacing : 300 mm as standard. (Others available upon request)
- Connectors : GRP as standard. (SS 316 grade available upon request. Page-36-37)
- Fasteners : 4 sets M8x25 SS316 (Page-42)
- Covers : Available upon request (Page-27)

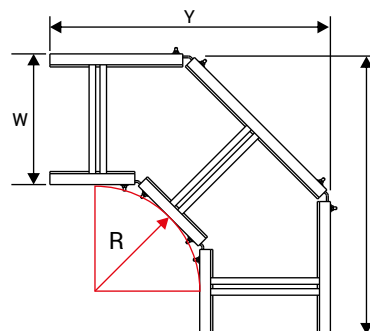
YD45 Horizontal Elbow Pultruded, delivered assembled



Width (mm)	Radius	Description	Code		Weight (kg/pcs)		Y (mm)
			↓100	↓150	↓100	↓150	
150	300	KCA GRP 150/YD45/R300	3193237	3193264	2,1	3,5	495
	450	KCA GRP 150/YD45/R450	3193246	3193273	2,5	4,1	525
	600	KCA GRP 150/YD45/R600	3193255	3193282	2,9	4,8	740
200	300	KCA GRP 200/YD45/R300	3193238	3193265	2,2	3,7	545
	450	KCA GRP 200/YD45/R450	3193247	3193274	2,6	4,3	575
	600	KCA GRP 200/YD45/R600	3193256	3193283	3,0	4,9	790
300	300	KCA GRP 300/YD45/R300	3193239	3193266	2,5	4,0	645
	450	KCA GRP 300/YD45/R450	3193248	3193275	2,9	4,7	675
	600	KCA GRP 300/YD45/R600	3193257	3193284	3,2	5,3	890
400	300	KCA GRP 400/YD45/R300	3193240	3193267	2,7	4,3	745
	450	KCA GRP 400/YD45/R450	3193249	3193276	3,1	5,0	775
	600	KCA GRP 400/YD45/R600	3193258	3193285	3,5	5,7	990
450	300	KCA GRP 450/YD45/R300	3193241	3193268	2,8	4,6	795
	450	KCA GRP 450/YD45/R450	3193250	3193277	3,2	5,3	825
	600	KCA GRP 450/YD45/R600	3193259	3193286	3,6	5,9	1040
500	300	KCA GRP 500/YD45/R300	3193242	3193269	2,9	4,8	845
	450	KCA GRP 500/YD45/R450	3193251	3193278	3,3	5,5	875
	600	KCA GRP 500/YD45/R600	3193260	3193287	3,7	6,1	1090
600	300	KCA GRP 600/YD45/R300	3193243	3193270	3,2	5,1	945
	450	KCA GRP 600/YD45/R450	3193252	3193279	3,6	5,8	975
	600	KCA GRP 600/YD45/R600	3193261	3193288	4,0	6,4	1190
750	300	KCA GRP 750/YD45/R300	3193244	3193271	3,6	5,8	1095
	450	KCA GRP 750/YD45/R450	3193253	3193280	4,0	6,4	1125
	600	KCA GRP 750/YD45/R600	3193262	3193289	4,3	7,0	1340
900	300	KCA GRP 900/YD45/R300	3193245	3193272	3,9	6,3	1245
	450	KCA GRP 900/YD45/R450	3193254	3193281	4,3	7,0	1275
	600	KCA GRP 900/YD45/R600	3193263	3193290	4,7	7,6	1490

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37).
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-28 for order.

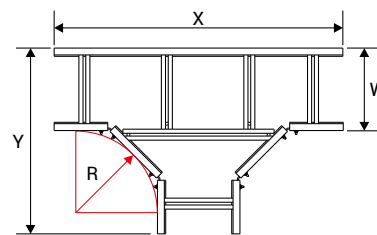
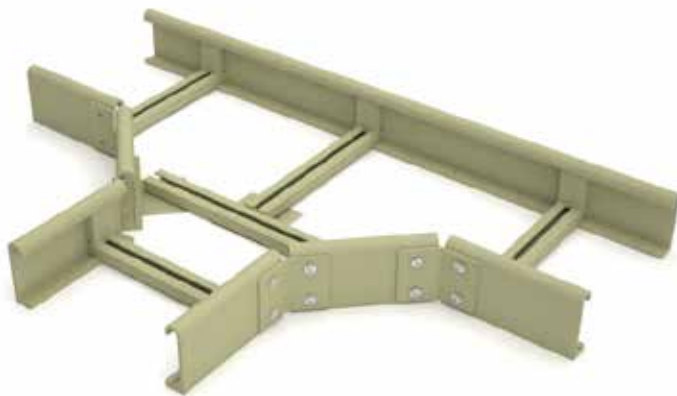
YD90 Horizontal Elbow Pultruded, delivered assembled



Width (mm)	Radius	Description	Code		Weight (kg/pcs)		Y (mm)
			↑100	↑150	↑100	↑150	
150	300	KCA GRP 150 YD90 DON. R300	3177591	3177600	3,1	5,0	495
	450	KCA GRP 150 YD90 DON. R450	3177397	3177406	3,6	5,8	525
	600	KCA GRP 150 YD90 DON. R600	3177672	3177681	4,2	6,7	740
200	300	KCA GRP 200 YD90 DON. R300	3177592	3177601	3,3	5,3	545
	450	KCA GRP 200 YD90 DON. R450	3177398	3177407	3,8	6,1	575
	600	KCA GRP 200 YD90 DON. R600	3177673	3177682	4,4	7,0	790
300	300	KCA GRP 300 YD90 DON. R300	3177593	3177602	3,7	5,8	645
	450	KCA GRP 300 YD90 DON. R450	3177399	3177408	4,3	6,7	675
	600	KCA GRP 300 YD90 DON. R600	3177674	3177683	4,9	7,6	890
400	300	KCA GRP 400 YD90 DON. R300	3177594	3177603	4,4	6,7	745
	450	KCA GRP 400 YD90 DON. R450	3177400	3177409	4,9	7,5	775
	600	KCA GRP 400 YD90 DON. R600	3177675	3177684	5,4	8,2	990
450	300	KCA GRP 450 YD90 DON. R300	3177595	3177604	4,6	7,0	795
	450	KCA GRP 450 YD90 DON. R450	3177401	3177410	5,1	7,8	825
	600	KCA GRP 450 YD90 DON. R600	3177676	3177685	5,6	8,5	1040
500	300	KCA GRP 500 YD90 DON. R300	3177596	3177605	4,9	7,3	845
	450	KCA GRP 500 YD90 DON. R450	3177402	3177411	5,3	8,1	875
	600	KCA GRP 500 YD90 DON. R600	3177677	3177686	5,8	8,9	1090
600	300	KCA GRP 600 YD90 DON. R300	3177597	3177606	5,3	7,9	945
	450	KCA GRP 600 YD90 DON. R450	3177403	3177412	5,8	8,7	975
	600	KCA GRP 600 YD90 DON. R600	3177678	3177687	6,3	9,5	1190
750	300	KCA GRP 750 YD90 DON. R300	3177598	3177607	6,0	8,9	1095
	450	KCA GRP 750 YD90 DON. R450	3177404	3177413	6,5	9,7	1125
	600	KCA GRP 750 YD90 DON. R600	3177679	3177688	7,0	10,4	1340
900	300	KCA GRP 900 YD90 DON. R300	3177599	3177608	6,7	9,9	1245
	450	KCA GRP 900 YD90 DON. R450	3177405	3177414	7,2	10,6	1275
	600	KCA GRP 900 YD90 DON. R600	3177680	3177689	7,7	11,4	1490

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37).
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-29 for order.

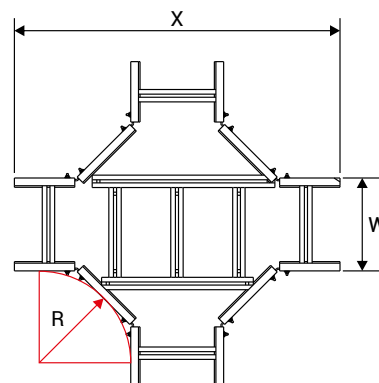
YT Horizontal Cross Pultruded, delivered assembled



Width (mm)	Radius	Description	Code		Weight (kg/pcs)		Y (mm)	X (mm)
			↓100	↓150	↓100	↓150		
150	300	KCA GRP 150/YT/R300	3177609	3177618	4,8	7,7	495	840
	450	KCA GRP 150/YT/R450	3177433	3177442	5,4	8,8	525	900
	600	KCA GRP 150/YT/R600	3177690	3177699	6,1	9,8	740	1330
200	300	KCA GRP 200/YT/R300	3177610	3177619	5,0	7,9	545	890
	450	KCA GRP 200/YT/R450	3177434	3177443	5,7	9,0	575	950
	600	KCA GRP 200/YT/R600	3177691	3177700	6,3	10,2	790	1380
300	300	KCA GRP 300/YT/R300	3177611	3177620	5,4	8,5	645	990
	450	KCA GRP 300/YT/R450	3177435	3177444	6,2	9,6	675	1050
	600	KCA GRP 300/YT/R600	3177692	3177701	6,9	10,8	890	1480
400	300	KCA GRP 400/YT/R300	3177612	3177621	6,1	9,3	745	1090
	450	KCA GRP 400/YT/R450	3177436	3177445	6,9	10,5	775	1150
	600	KCA GRP 400/YT/R600	3177693	3177702	7,7	11,8	990	1580
450	300	KCA GRP 450/YT/R300	3177613	3177622	6,4	9,6	795	1140
	450	KCA GRP 450/YT/R450	3177437	3177446	7,1	10,8	825	1200
	600	KCA GRP 450/YT/R600	3177694	3177703	7,9	12,0	1040	1630
500	300	KCA GRP 500/YT/R300	3177614	3177623	6,6	9,9	845	1190
	450	KCA GRP 500/YT/R450	3177438	3177447	7,4	11,1	875	1250
	600	KCA GRP 500/YT/R600	3177695	3177704	8,2	12,3	1090	1680
600	300	KCA GRP 600/YT/R300	3177615	3177624	7,1	10,5	945	1290
	450	KCA GRP 600/YT/R450	3177439	3177448	7,9	11,7	975	1350
	600	KCA GRP 600/YT/R600	3177696	3177705	8,7	13,0	1190	1780
750	300	KCA GRP 750/YT/R300	3177616	3177625	8,3	11,9	1095	1440
	450	KCA GRP 750/YT/R450	3177440	3177449	9,2	13,2	1125	1500
	600	KCA GRP 750/YT/R600	3177697	3177706	10,0	14,5	1340	1930
900	300	KCA GRP 900/YT/R300	3177617	3177626	9,2	12,9	1245	1590
	450	KCA GRP 900/YT/R450	3177441	3177450	10,1	14,3	1275	1650
	600	KCA GRP 900/YT/R600	3177698	3177707	11,1	15,7	1490	2080

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37)
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-30 for order.

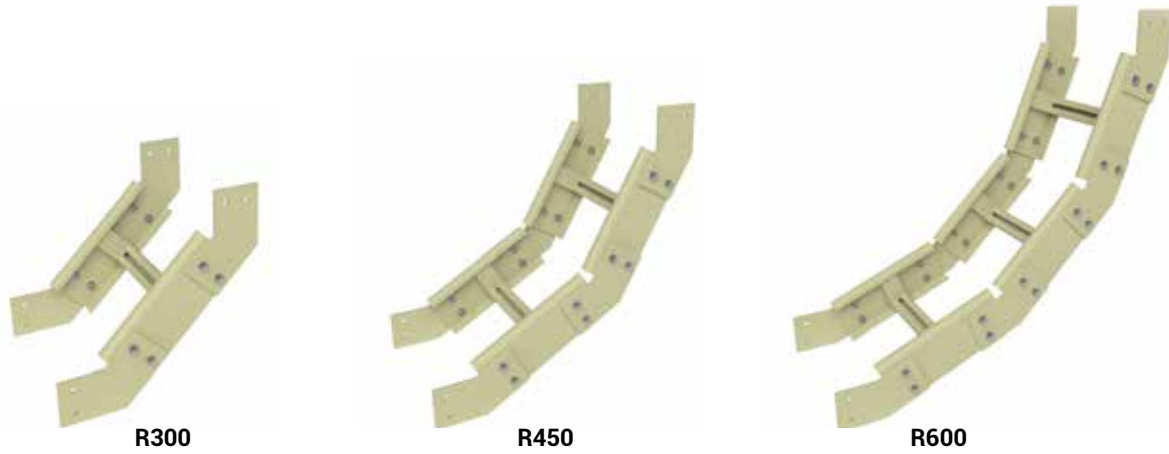
AD Horizontal Cross Pultruded, delivered assembled



Width (mm)	Radius	Description	Code		Weight (kg/pcs)		X (mm)
			↑100	↑150	↑100	↑150	
150	300	KCA GRP 150/AD/R300	3177627	3177636	2,1	9,8	840
	450	KCA GRP 150/AD/R450	3177451	3177460	2,5	11,0	900
	600	KCA GRP 150/AD/R600	3177708	3177717	2,9	12,3	1330
200	300	KCA GRP 200/AD/R300	3177628	3177637	2,2	10,0	890
	450	KCA GRP 200/AD/R450	3177452	3177461	2,6	11,2	950
	600	KCA GRP 200/AD/R600	3177709	3177718	3,0	12,5	1380
300	300	KCA GRP 300/AD/R300	3177629	3177638	2,5	10,4	990
	450	KCA GRP 300/AD/R450	3177453	3177462	2,9	11,8	1050
	600	KCA GRP 300/AD/R600	3177710	3177719	3,2	13,2	1480
400	300	KCA GRP 400/AD/R300	3177630	3177639	2,7	10,8	1090
	450	KCA GRP 400/AD/R450	3177454	3177463	3,1	12,2	1150
	600	KCA GRP 400/AD/R600	3177711	3177720	3,5	13,7	1580
450	300	KCA GRP 450/AD/R300	3177631	3177640	2,8	11,0	1140
	450	KCA GRP 450/AD/R450	3177455	3177464	3,2	12,4	1200
	600	KCA GRP 450/AD/R600	3177712	3177721	3,6	13,9	1630
500	300	KCA GRP 500/AD/R300	3177632	3177641	2,9	11,2	1190
	450	KCA GRP 500/AD/R450	3177456	3177465	3,3	12,7	1250
	600	KCA GRP 500/AD/R600	3177713	3177722	3,7	14,1	1680
600	300	KCA GRP 600/AD/R300	3177633	3177642	3,2	12,0	1290
	450	KCA GRP 600/AD/R450	3177457	3177466	3,6	13,3	1350
	600	KCA GRP 600/AD/R600	3177714	3177723	4,0	14,6	1780
750	300	KCA GRP 750/AD/R300	3177634	3177643	3,6	12,7	1440
	450	KCA GRP 750/AD/R450	3177458	3177467	4,0	14,3	1500
	600	KCA GRP 750/AD/R600	3177715	3177724	4,3	15,9	1930
900	300	KCA GRP 900/AD/R300	3177635	3177644	3,9	14,0	1590
	450	KCA GRP 900/AD/R450	3177459	3177468	4,3	15,7	1650
	600	KCA GRP 900/AD/R600	3177716	3177725	4,7	17,3	2080

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37)
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-31 for order.

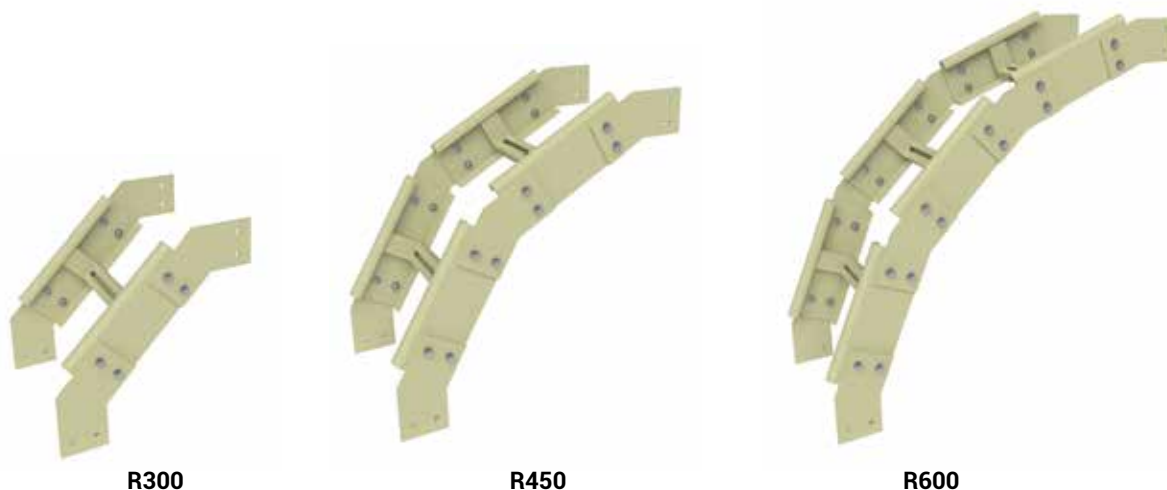
ID90 Inside Vertical Fitting Pultruded, delivered assembled



Width (mm)	Radius	Description	Code		Weight (kg/pcs)	
			↑100	↑150	↑100	↑150
150	300	KCA GRP 150/ID90/R300	3193516	3193543	1,45	2,45
	450	KCA GRP 150/ID90/R450	3193525	3193552	2,65	4,25
	600	KCA GRP 150/ID90/R600	3193534	3193561	3,85	6,05
200	300	KCA GRP 200/ID90/R300	3193517	3193544	1,50	2,50
	450	KCA GRP 200/ID90/R450	3193526	3193553	2,75	4,30
	600	KCA GRP 200/ID90/R600	3193535	3193562	4,00	6,20
300	300	KCA GRP 300/ID90/R300	3193518	3193545	1,55	2,55
	450	KCA GRP 300/ID90/R450	3193527	3193554	2,85	4,45
	600	KCA GRP 300/ID90/R600	3193536	3193563	4,15	6,40
400	300	KCA GRP 400/ID90/R300	3193519	3193546	1,60	2,65
	450	KCA GRP 400/ID90/R450	3193528	3193555	2,95	4,65
	600	KCA GRP 400/ID90/R600	3193537	3193564	4,30	6,65
450	300	KCA GRP 450/ID90/R300	3193520	3193547	1,65	2,70
	450	KCA GRP 450/ID90/R450	3193529	3193556	3,05	4,70
	600	KCA GRP 450/ID90/R600	3193538	3193565	4,45	6,75
500	300	KCA GRP 500/ID90/R300	3193521	3193548	1,70	2,75
	450	KCA GRP 500/ID90/R450	3193530	3193557	3,15	4,80
	600	KCA GRP 500/ID90/R600	3193539	3193566	4,60	6,90
600	300	KCA GRP 600/ID90/R300	3193522	3193549	1,75	2,85
	450	KCA GRP 600/ID90/R450	3193531	3193558	3,25	4,95
	600	KCA GRP 600/ID90/R600	3193540	3193567	4,75	7,10
750	300	KCA GRP 750/ID90/R300	3193523	3193550	1,80	2,90
	450	KCA GRP 750/ID90/R450	3193532	3193559	3,35	5,20
	600	KCA GRP 750/ID90/R600	3193541	3193568	4,90	7,45
900	300	KCA GRP 900/ID90/R300	3193524	3193551	1,85	3,05
	450	KCA GRP 900/ID90/R450	3193533	3193560	3,45	5,40
	600	KCA GRP 900/ID90/R600	3193542	3193569	5,05	7,80

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37).
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-32 for order.

DD90 Outside Vertical Fitting Pultruded, delivered assembled



R300

R450

R600

Width (mm)	Radius	Description	Code		Weight (kg/pcs)	
			↑100	↑150	↑100	↑150
150	300	KCA GRP 150/DD90/R300	3193570	3193597	1,45	2,45
	450	KCA GRP 150/DD90/R450	3193579	3193606	2,65	4,25
	600	KCA GRP 150/DD90/R600	3193588	3193615	3,85	6,05
200	300	KCA GRP 200/DD90/R300	3193571	3193598	1,50	2,50
	450	KCA GRP 200/DD90/R450	3193580	3193607	2,75	4,30
	600	KCA GRP 200/DD90/R600	3193589	3193616	4,00	6,20
300	300	KCA GRP 300/DD90/R300	3193572	3193599	1,55	2,55
	450	KCA GRP 300/DD90/R450	3193581	3193608	2,85	4,45
	600	KCA GRP 300/DD90/R600	3193590	3193617	4,15	6,40
400	300	KCA GRP 400/DD90/R300	3193573	3193600	1,60	2,65
	450	KCA GRP 400/DD90/R450	3193582	3193609	2,95	4,65
	600	KCA GRP 400/DD90/R600	3193591	3193618	4,30	6,65
450	300	KCA GRP 450/DD90/R300	3193574	3193601	1,65	2,70
	450	KCA GRP 450/DD90/R450	3193583	3193610	3,05	4,70
	600	KCA GRP 450/DD90/R600	3193592	3193619	4,45	6,75
500	300	KCA GRP 500/DD90/R300	3193575	3193602	1,70	2,75
	450	KCA GRP 500/DD90/R450	3193584	3193611	3,15	4,80
	600	KCA GRP 500/DD90/R600	3193593	3193620	4,60	6,90
600	300	KCA GRP 600/DD90/R300	3193576	3193603	1,75	2,85
	450	KCA GRP 600/DD90/R450	3193585	3193612	3,25	4,95
	600	KCA GRP 600/DD90/R600	3193594	3193621	4,75	7,10
750	300	KCA GRP 750/DD90/R300	3193577	3193604	1,80	2,90
	450	KCA GRP 750/DD90/R450	3193586	3193613	3,35	5,20
	600	KCA GRP 750/DD90/R600	3193595	3193622	4,90	7,45
900	300	KCA GRP 900/DD90/R300	3193578	3193605	1,85	3,05
	450	KCA GRP 900/DD90/R450	3193587	3193614	3,45	5,40
	600	KCA GRP 900/DD90/R600	3193596	3193623	5,05	7,80

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37)
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-32 for order.

Vertical Adjustable Fitting Pultruded, delivered assembled

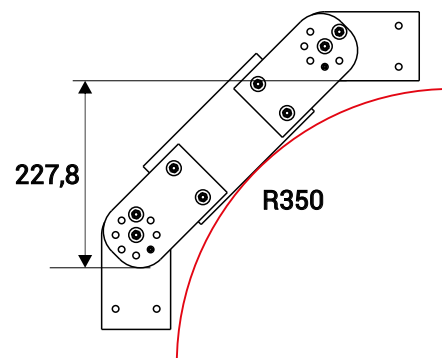
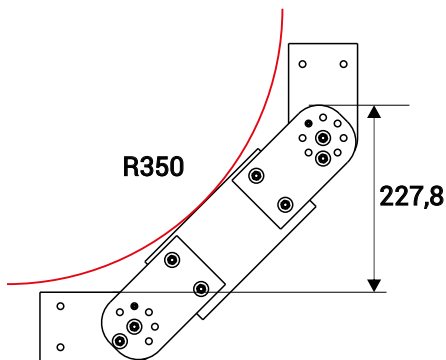


ID (INSIDE VERTICAL)



DD (OUTSIDE VERTICAL)

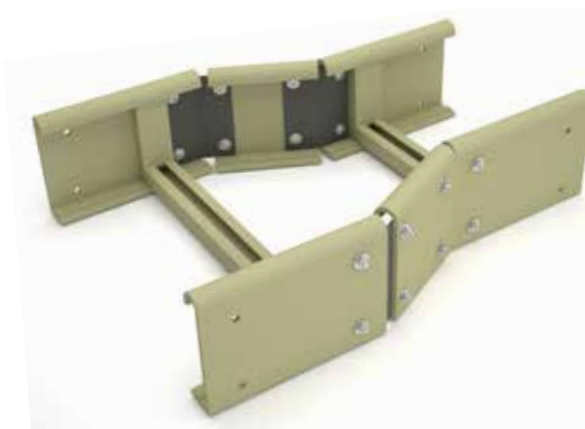
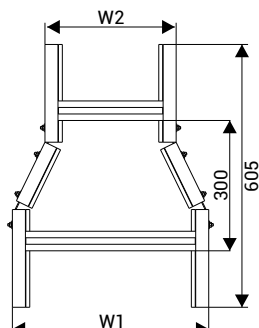
Description	Width (mm)	Thickness (mm)	Order Code		Weight (kg/pcs)	
			↑100	↑150	↑100	↑150
KCA GRP 150 SDM	150	5	3177415	3177424	2,3	3,6
KCA GRP 200 SDM	200	5	3177416	3177425	2,4	3,7
KCA GRP 300 SDM	300	5	3177417	3177426	2,6	3,9
KCA GRP 400 SDM	400	5	3177418	3177427	2,8	4,1
KCA GRP 450 SDM	450	5	3177419	3177428	2,9	4,2
KCA GRP 500 SDM	500	5	3177420	3177429	3,0	4,3
KCA GRP 600 SDM	600	5	3177421	3177430	3,2	4,5
KCA GRP 750 SDM	750	5	3177422	3177431	3,5	4,8
KCA GRP 900 SDM	900	5	3177423	3177432	3,8	5,1



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37).
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-32 for order.

Reducer Middle

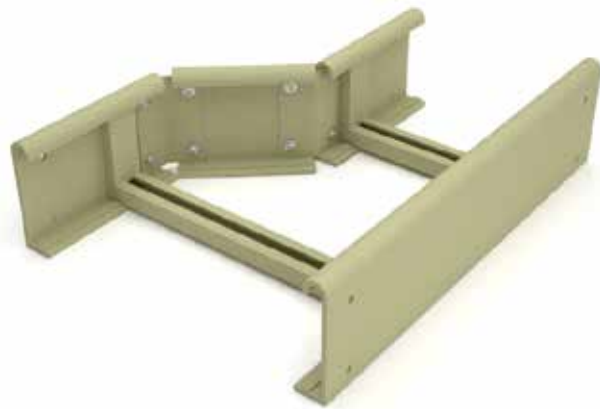
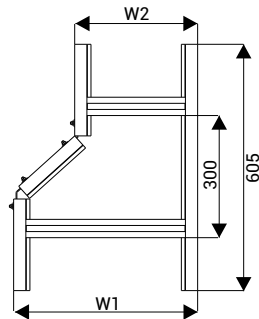
Pultruded, delivered assembled



W1 (mm)	W2 (mm)	Description	Code		Weight (kg/pcs)	
			↓100	↓150	↓100	↓150
300	150	KCA GRP 300/150/ MR	3193291	3193324	3,2	5,0
400		KCA GRP 400/150/ MR	3193292	3193325	3,3	5,1
450		KCA GRP 450/150/ MR	3193293	3193326	3,4	5,2
500		KCA GRP 500/150/ MR	3193294	3193327	3,4	5,3
600		KCA GRP 600/150/ MR	3193295	3193328	3,6	5,5
750		KCA GRP 750/150/ MR	3193296	3193329	3,9	6,1
900		KCA GRP 900/150/ MR	3193297	3193330	4,2	6,5
300		200	KCA GRP 300/200/ MR	3193298	3193331	3,2
400	KCA GRP 400/200/ MR		3193299	3193332	3,3	5,1
450	KCA GRP 450/200/ MR		3193300	3193333	3,4	5,2
500	KCA GRP 500/200/ MR		3193301	3193334	3,4	5,3
600	KCA GRP 600/200/ MR		3193302	3193335	3,6	5,5
750	KCA GRP 750/200/ MR		3193303	3193336	3,9	5,9
900	KCA GRP 900/200/ MR		3193304	3193337	4,1	6,4
400	300		KCA GRP 400/300/ MR	3193305	3193338	3,2
450		KCA GRP 450/300/ MR	3193306	3193339	3,3	5,1
500		KCA GRP 500/300/ MR	3193307	3193340	3,5	5,4
600		KCA GRP 600/300/ MR	3193308	3193341	3,6	5,5
750		KCA GRP 750/300/ MR	3193309	3193342	3,8	5,8
900		KCA GRP 900/300/ MR	3193310	3193343	4,1	6,3
500	400	KCA GRP 500/400/ MR	3193311	3193344	3,4	5,3
600		KCA GRP 600/400/ MR	3193312	3193345	3,5	5,4
750		KCA GRP 750/400/ MR	3193313	3193346	3,7	5,7
900		KCA GRP 900/400/ MR	3193314	3193347	4,0	6,2
600	450	KCA GRP 600/450/ MR	3193315	3193348	3,5	5,4
750		KCA GRP 750/450/ MR	3193316	3193349	3,7	5,7
900		KCA GRP 900/450/ MR	3193317	3193350	3,9	6,1
600	500	KCA GRP 600/500/ MR	3193318	3193351	3,6	5,5
750		KCA GRP 750/500/ MR	3193319	3193352	3,7	5,7
900		KCA GRP 900/500/ MR	3193320	3193353	3,9	6,1
750	600	KCA GRP 750/600/ MR	3193321	3193354	3,7	5,7
900		KCA GRP 900/600/ MR	3193322	3193355	3,9	5,9
900	750	KCA GRP 900/750/ MR	3193323	3193356	3,9	5,9

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37)
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-33 for order.

Reducer Right Pultruded, delivered assembled

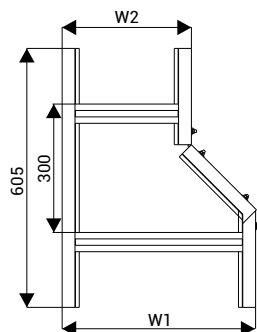


W1 (mm)	W2 (mm)	Description	Code		Weight (kg/pcs)	
			↑100	↑150	↑100	↑150
300	150	KCA GRP 300/150/ RR	3193357	3193390	2,8	4,4
400		KCA GRP 400/150/ RR	3193358	3193391	2,9	4,6
450		KCA GRP 450/150/ RR	3193359	3193392	3,0	4,8
500		KCA GRP 500/150/ RR	3193360	3193393	3,1	5,1
600		KCA GRP 600/150/ RR	3193361	3193394	3,3	5,3
750		KCA GRP 750/150/ RR	3193362	3193395	3,5	5,6
900		KCA GRP 900/150/ RR	3193363	3193396	3,9	6,3
300		200	KCA GRP 300/200/ RR	3193364	3193397	2,8
400	KCA GRP 400/200/ RR		3193365	3193398	2,9	4,6
450	KCA GRP 450/200/ RR		3193366	3193399	3,0	4,7
500	KCA GRP 500/200/ RR		3193367	3193400	3,1	5,0
600	KCA GRP 600/200/ RR		3193368	3193401	3,2	5,2
750	KCA GRP 750/200/ RR		3193369	3193402	3,5	5,7
900	KCA GRP 900/200/ RR		3193370	3193403	3,9	6,2
400	300		KCA GRP 400/300/ RR	3193371	3193404	2,9
450		KCA GRP 450/300/ RR	3193372	3193405	3,0	4,7
500		KCA GRP 500/300/ RR	3193373	3193406	3,1	4,8
600		KCA GRP 600/300/ RR	3193374	3193407	3,2	5,1
750		KCA GRP 750/300/ RR	3193375	3193408	3,4	5,5
900		KCA GRP 900/300/ RR	3193376	3193409	3,7	6,1
500	400	KCA GRP 500/400/ RR	3193377	3193410	3,0	4,7
600		KCA GRP 600/400/ RR	3193378	3193411	3,1	5,0
750		KCA GRP 750/400/ RR	3193379	3193412	3,3	5,4
900		KCA GRP 900/400/ RR	3193380	3193413	3,6	5,8
600	450	KCA GRP 600/450/ RR	3193381	3193414	3,1	5,0
750		KCA GRP 750/450/ RR	3193382	3193415	3,3	5,4
900		KCA GRP 900/450/ RR	3193383	3193416	3,6	5,8
600	500	KCA GRP 600/500/ RR	3193384	3193417	3,1	5,0
750		KCA GRP 750/500/ RR	3193385	3193418	3,3	5,3
900		KCA GRP 900/500/ RR	3193386	3193419	3,5	5,7
750	600	KCA GRP 750/600/ RR	3193387	3193420	3,2	5,2
900		KCA GRP 900/600/ RR	3193388	3193421	3,5	5,6
900	750	KCA GRP 900/750/ RR	3193389	3193422	3,4	5,4

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available, upon request. Page-36-37)
- **Fasteners** : Check Page-42 for order.
- **Covers** : Check Page-34 for order.

Reducer Left

Pultruded, delivered assembled

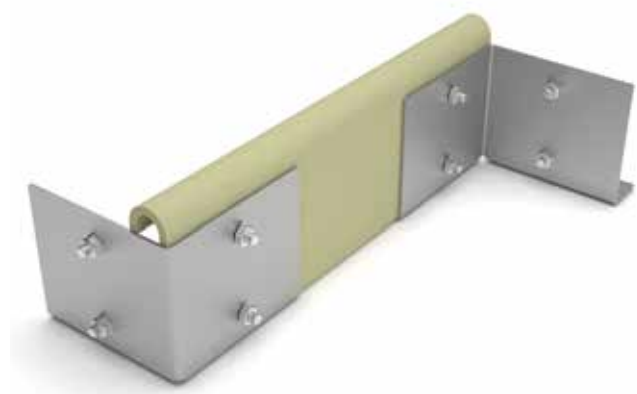
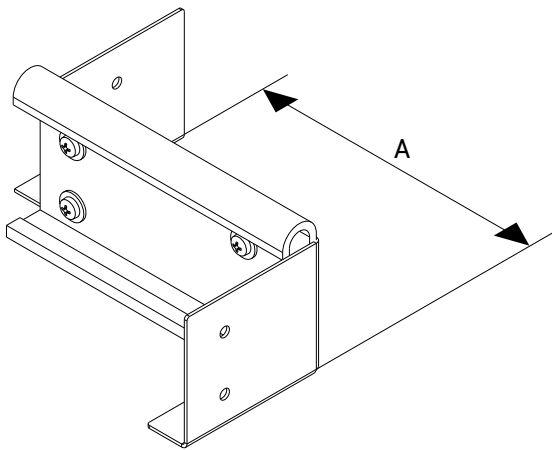


W1 (mm)	W2 (mm)	Description	Code		Weight (kg/pcs)	
			↑100	↑150	↑100	↑150
300	150	KCA GRP 300/150/ LR	3193423	3193456	2,8	4,4
400		KCA GRP 400/150/ LR	3193424	3193457	2,9	4,6
450		KCA GRP 450/150/ LR	3193425	3193458	3,0	4,8
500		KCA GRP 500/150/ LR	3193426	3193459	3,1	5,1
600		KCA GRP 600/150/ LR	3193427	3193460	3,3	5,3
750		KCA GRP 750/150/ LR	3193428	3193461	3,5	5,6
900		KCA GRP 900/150/ LR	3193429	3193462	3,9	6,3
300	200	KCA GRP 300/200/ LR	3193430	3193463	2,8	4,5
400		KCA GRP 400/200/ LR	3193431	3193464	2,9	4,6
450		KCA GRP 450/200/ LR	3193432	3193465	3,0	4,7
500		KCA GRP 500/200/ LR	3193433	3193466	3,1	5,0
600		KCA GRP 600/200/ LR	3193434	3193467	3,2	5,2
750		KCA GRP 750/200/ LR	3193435	3193468	3,5	5,7
900		KCA GRP 900/200/ LR	3193436	3193469	3,9	6,2
400	300	KCA GRP 400/300/ LR	3193437	3193470	2,9	4,6
450		KCA GRP 450/300/ LR	3193438	3193471	3,0	4,7
500		KCA GRP 500/300/ LR	3193439	3193472	3,1	4,8
600		KCA GRP 600/300/ LR	3193440	3193473	3,2	5,1
750		KCA GRP 750/300/ LR	3193441	3193474	3,4	5,5
900		KCA GRP 900/300/ LR	3193442	3193475	3,7	6,1
500	400	KCA GRP 500/400/ LR	3193443	3193476	3,0	4,7
600		KCA GRP 600/400/ LR	3193444	3193477	3,1	5,0
750		KCA GRP 750/400/ LR	3193445	3193478	3,3	5,4
900		KCA GRP 900/400/ LR	3193446	3193479	3,6	5,8
600	450	KCA GRP 600/450/ LR	3193447	3193480	3,1	5,0
750		KCA GRP 750/450/ LR	3193448	3193481	3,3	5,4
900		KCA GRP 900/450/ LR	3193449	3193482	3,6	5,8
600	500	KCA GRP 600/500/ LR	3193450	3193483	3,1	5,0
750		KCA GRP 750/500/ LR	3193451	3193484	3,3	5,3
900		KCA GRP 900/500/ LR	3193452	3193485	3,5	5,7
750	600	KCA GRP 750/600/ LR	3193453	3193486	3,2	5,2
900		KCA GRP 900/600/ LR	3193454	3193487	3,5	5,6
900	750	KCA GRP 900/750/ LR	3193455	3193488	3,4	5,4

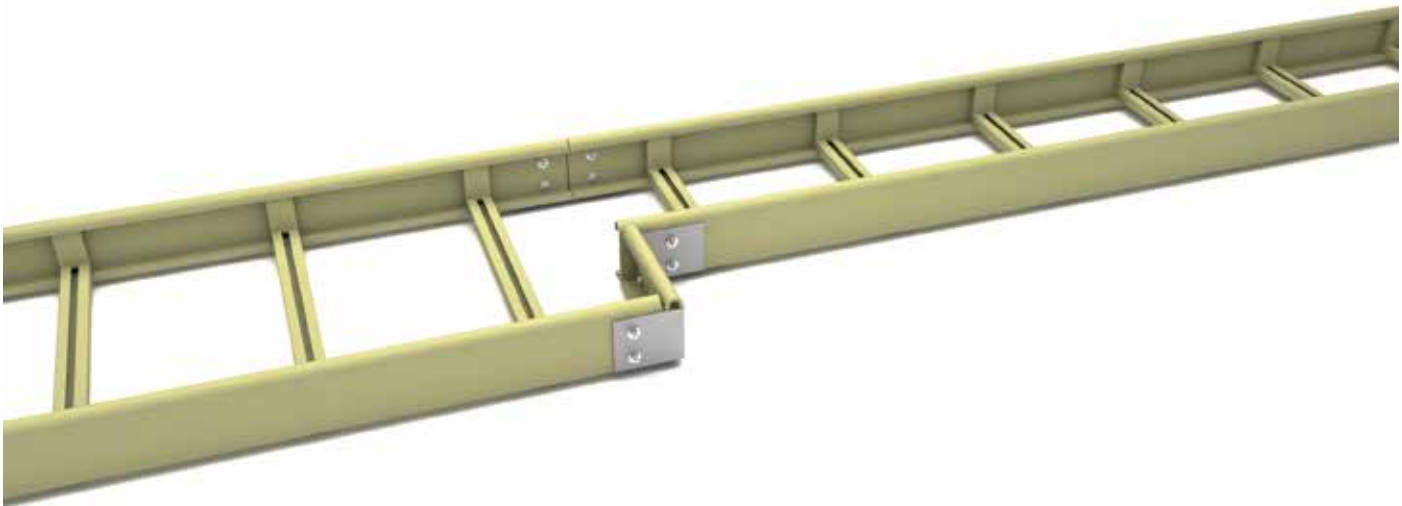
- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Rung spacing** : 300 mm as standard. (Others available upon request)
- **Connectors** : GRP as standard. (SS 316 grade available upon request. Page-36-37)
- **Fasteners** : 4 sets M8x25 SS316 (Page-42)
- **Covers** : Available upon request (Page-34)

Reducer Connector

Pultruded, Straight + Stainless Steel Flange, delivered assembled



Description	A (mm)	Order Code		Weight (kg/pcs)	
		↓100	↓150	↓100	↓150
KCA GRP MR 050	50	3193624	3193629	0,8	1,1
KCA GRP MR 100	100	3177469	3177476	0,9	1,3
KCA GRP MR 150	150	3177470	3177477	1,1	1,6
KCA GRP MR 200	200	3177471	3177478	1,3	1,9
KCA GRP MR 250	250	3193625	3193630	1,4	2,0
KCA GRP MR 300	300	3177472	3177479	1,5	2,1
KCA GRP MR 350	350	3193626	3193631	1,55	2,3
KCA GRP MR 400	400	3177473	3177480	1,6	2,4
KCA GRP MR 450	450	3193627	3193632	1,65	2,5
KCA GRP MR 500	500	3177474	3177481	1,7	2,6
KCA GRP MR 600	600	3177475	3177482	1,9	2,9
KCA GRP MR 750	750	3193628	3193633	2,1	3,3



- For Reducer fitting, main body available in GRP, flanged edges are in stainless steel 316.
- 4 bolts M8x25 SS316 should be ordered per splice plate.
- Also, 8 bolts per splice plate is available upon request.

Straight Cover



Description	Height (mm)	Width (mm)	Length (m)	Thickness (mm)	Weight (kg/m)	Code
KCA/CTA GRP K 050 / L3M	15	50	3 M	3	0,45	3191138
KCA/CTA GRP K 100 / L3M	15	100	3 M	3	0,70	3191139
KCA/CTA GRP K 150 / L3M	15	150	3 M	3	0,95	3177489
KCA/CTA GRP K 200 / L3M	15	200	3 M	3	1,20	3177490
KCA/CTA GRP K 250 / L3M	15	250	3 M	3	1,50	3191142
KCA/CTA GRP K 300 / L3M	15	300	3 M	3	1,75	3177491
KCA/CTA GRP K 400 / L3M	15	400	3 M	3	2,25	3177492
KCA/CTA GRP K 450 / L3M	15	450	3 M	3	2,55	3177493
KCA/CTA GRP K 500 / L3M	15	500	3 M	3	2,80	3177494
KCA/CTA GRP K 600 / L3M	15	600	3 M	3	3,30	3177495
KCA/CTA GRP K 750 / L3M	15	750	3 M	3	4,10	3177496
KCA/CTA GRP K 900 / L3M	15	900	3 M	3	4,90	3177497

Recommended number of cover clamps;

	Quantity of Standard Cover Clamps Required	
	Standard Cover Clamp	Heavy Duty Cover Clamp
Straight Sections (3M)	6 pcs (2 pcs per meter)	3 pcs (1 pcs per meter)
Horizontal/Vertical Bends	4 pcs	2 pcs
Tees	6 pcs	3 pcs
Crosses	8 pcs	4 pcs

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : For standard installation, 2 pcs "Standard cover clamp" should be ordered per meter. (Page-39)
For windy conditions, 1 pcs "Heavy duty cover clamp" should be ordered per meter. (Page-40)

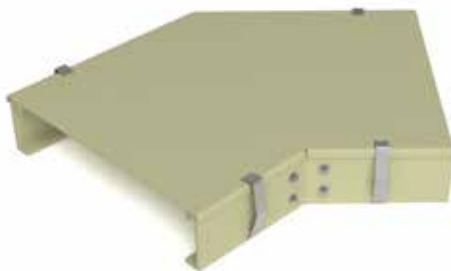
Fitting Cover YD45



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
KCA GRP K 150 YD45 / R	15	150	3	3193634	3193643	3193652	0,5	0,7	0,8
KCA GRP K 200 YD45 / R	15	200	3	3193635	3193644	3193653	0,7	0,8	1,0
KCA GRP K 300 YD45 / R	15	300	3	3193636	3193645	3193654	1,0	1,3	1,5
KCA GRP K 400 YD45 / R	15	400	3	3193637	3193646	3193655	1,4	1,7	2,0
KCA GRP K 450 YD45 / R	15	450	3	3193638	3193647	3193656	1,6	2,0	2,3
KCA GRP K 500 YD45 / R	15	500	3	3193639	3193648	3193657	1,9	2,2	2,6
KCA GRP K 600 YD45 / R	15	600	3	3193640	3193649	3193658	2,3	2,8	3,2
KCA GRP K 750 YD45 / R	15	750	3	3193641	3193650	3193659	3,1	3,7	4,2
KCA GRP K 900 YD45 / R	15	900	3	3193642	3193651	3193660	4,0	4,7	5,3

Assembly

• Standard Cover Clamp



• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : Check Page-39-40 for order.

Fitting Cover YD90



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
KCA GRP K 150 YD90 / R	15	150	3	3177645	3177498	3177726	0,9	1,0	1,1
KCA GRP K 200 YD90/ R	15	200	3	3177646	3177499	3177727	1,1	1,3	1,5
KCA GRP K 300 YD90/ R	15	300	3	3177647	3177500	3177728	1,7	2,0	2,3
KCA GRP K 400 YD90/ R	15	400	3	3177648	3177501	3177729	2,4	2,8	3,2
KCA GRP K 450 YD90/ R	15	450	3	3177649	3177502	3177730	2,8	3,2	3,7
KCA GRP K 500 YD90/ R	15	500	3	3177650	3177503	3177731	3,2	3,7	4,2
KCA GRP K 600 YD90/ R	15	600	3	3177651	3177504	3177732	4,1	4,7	5,2
KCA GRP K 750 YD90/ R	15	750	3	3177652	3177505	3177733	5,6	6,3	7,0
KCA GRP K 900 YD90/ R	15	900	3	3177653	3177506	3177734	7,3	8,2	8,7

Assembly

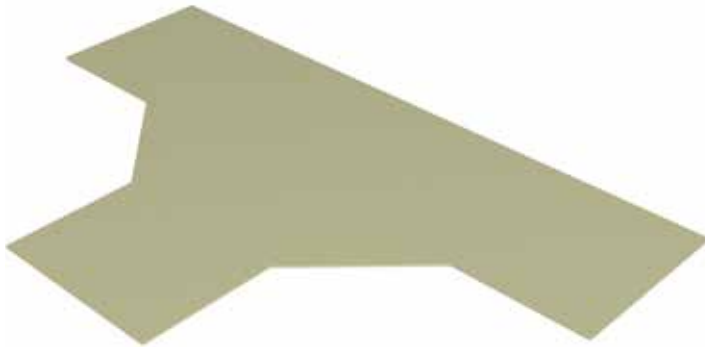
• Standard Cover Clamp

• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : Check Page-39-40 for order.

Fitting Cover YT

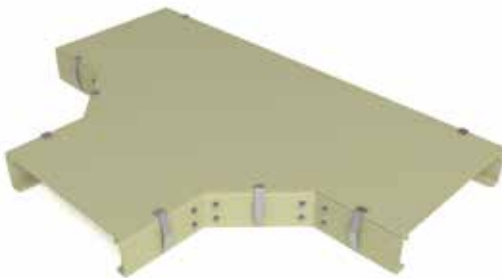


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
KCA GRP K 150 YT / R	15	150	3	3177654	3177516	3177735	1,5	2,0	2,6
KCA GRP K 200 YT / R	15	200	3	3177655	3177517	3177736	1,9	2,5	3,2
KCA GRP K 300 YT / R	15	300	3	3177656	3177518	3177737	2,8	3,6	4,5
KCA GRP K 400 YT / R	15	400	3	3177657	3177519	3177738	3,8	4,8	5,9
KCA GRP K 450 YT / R	15	450	3	3177658	3177520	3177739	4,4	5,5	6,6
KCA GRP K 500 YT / R	15	500	3	3177659	3177521	3177740	5,0	6,2	7,4
KCA GRP K 600 YT / R	15	600	3	3177660	3177522	3177741	6,2	7,6	9,0
KCA GRP K 750 YT / R	15	750	3	3177661	3177523	3177742	8,3	10,0	11,6
KCA GRP K 900 YT / R	15	900	3	3177662	3177524	3177743	10,7	12,6	14,5

Assembly

• Standard Cover Clamp

• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : Check Page-39-40 for order.

Fitting Cover AD



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
KCA GRP K 150 AD / R	15	150	3	3177663	3177525	3177744	2,0	2,9	3,8
KCA GRP K 200 AD / R	15	200	3	3177664	3177526	3177745	2,5	3,5	4,6
KCA GRP K 300 AD / R	15	300	3	3177665	3177527	3177746	3,6	4,9	6,2
KCA GRP K 400 AD / R	15	400	3	3177666	3177528	3177747	4,9	6,4	7,9
KCA GRP K 450 AD / R	15	450	3	3177667	3177529	3177748	5,5	7,2	8,8
KCA GRP K 500 AD / R	15	500	3	3177668	3177530	3177749	6,2	8,0	9,7
KCA GRP K 600 AD / R	15	600	3	3177669	3177531	3177750	7,7	9,7	11,7
KCA GRP K 750 AD / R	15	750	3	3177670	3177532	3177751	10,1	12,4	14,8
KCA GRP K 900 AD / R	15	900	3	3177671	3177533	3177752	12,7	15,5	18,1

Assembly

• Standard Cover Clamp

• Heavy Duty Cover Clamp



Fitting Cover ID90 Inside Vertical / DD90 Outside Vertical)



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
KCA GRP K 150 ID90/DD90 / R	15	150	3	3193661	3193670	3193679	0,3	0,60	0,9
KCA GRP K 200 ID90/DD90 / R	15	200	3	3193662	3193671	3193680	0,4	0,8	1,2
KCA GRP K 300 ID90/DD90 / R	15	300	3	3193663	3193672	3193681	0,5	1,0	1,5
KCA GRP K 400 ID90/DD90 / R	15	400	3	3193664	3193673	3193682	0,6	1,2	1,8
KCA GRP K 450 ID90/DD90 / R	15	450	3	3193665	3193674	3193683	0,7	1,4	2,1
KCA GRP K 500 ID90/DD90 / R	15	500	3	3193666	3193675	3193684	0,8	1,6	2,4
KCA GRP K 600 ID90/DD90 / R	15	600	3	3193667	3193676	3193685	0,9	1,8	2,7
KCA GRP K 750 ID90/DD90 / R	15	750	3	3193668	3193677	3193686	1,1	2,2	3,3
KCA GRP K 900 ID90/DD90 / R	15	900	3	3193669	3193678	3193687	1,3	2,6	3,9

Please order ;

- 1 pcs for R300
- 2 pcs for R450
- 3 pcs for R600

Fitting Cover SDM Verticle Adjustable

Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight
					(kg/pcs)
KCA GRP K 150 SDM	15	150	3	3177507	0,5
KCA GRP K 200 SDM	15	200	3	3177508	0,7
KCA GRP K 300 SDM	15	300	3	3177509	1,0
KCA GRP K 400 SDM	15	400	3	3177510	1,4
KCA GRP K 450 SDM	15	450	3	3177511	1,6
KCA GRP K 500 SDM	15	500	3	3177512	1,9
KCA GRP K 600 SDM	15	600	3	3177513	2,3
KCA GRP K 750 SDM	15	750	3	3177514	3,1
KCA GRP K 900 SDM	15	900	3	3177515	4,0

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : Check Page-39-40 for order.

MR Middle Reducer



W1 (mm)	W2 (mm)	Description	Code	Weight (kg/pcs)
300	150	KCA GRP K 300/150/ MR	3193688	0,80
400		KCA GRP K 400/150/ MR	3193689	1,00
450		KCA GRP K 450/150/ MR	3193690	1,10
500		KCA GRP K 500/150/ MR	3193691	1,20
600		KCA GRP K 600/150/ MR	3193692	1,40
750		KCA GRP K 750/150/ MR	3193693	1,60
900		KCA GRP K 900/150/ MR	3193694	1,90
300	200	KCA GRP K 300/200/ MR	3193695	0,90
400		KCA GRP K 400/200/ MR	3193696	1,10
450		KCA GRP K 450/200/ MR	3193697	1,20
500		KCA GRP K 500/200/ MR	3193698	1,30
600		KCA GRP K 600/200/ MR	3193699	1,40
750		KCA GRP K 750/200/ MR	3193700	1,70
900		KCA GRP K 900/200/ MR	3193701	2,00
400	300	KCA GRP K 400/300/ MR	3193702	1,30
450		KCA GRP K 450/300/ MR	3193703	1,40
500		KCA GRP K 500/300/ MR	3193704	1,50
600		KCA GRP K 600/300/ MR	3193705	1,60
750		KCA GRP K 750/300/ MR	3193706	1,90
900		KCA GRP K 900/300/ MR	3193707	2,10
500	400	KCA GRP K 500/400/ MR	3193708	1,60
600		KCA GRP K 600/400/ MR	3193709	1,80
750		KCA GRP K 750/400/ MR	3193710	2,10
900		KCA GRP K 900/400/ MR	3193711	2,30
600	450	KCA GRP K 600/450/ MR	3193712	1,90
750		KCA GRP K 750/450/ MR	3193713	2,10
900		KCA GRP K 900/450/ MR	3193714	2,40
600	500	KCA GRP K 600/500/ MR	3193715	2,00
750		KCA GRP K 750/500/ MR	3193716	2,20
900		KCA GRP K 900/500/ MR	3193717	2,50
750	600	KCA GRP K 750/600/ MR	3193718	2,40
900		KCA GRP K 900/600/ MR	3193719	2,70
900		750	KCA GRP K 900/750/ MR	3193720

Assembly

- Standard Cover Clamp

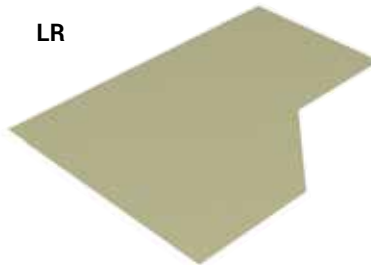


- Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : Check Page-39-40 for order.

RR (Right Reducer) / LR (Left Reducer)



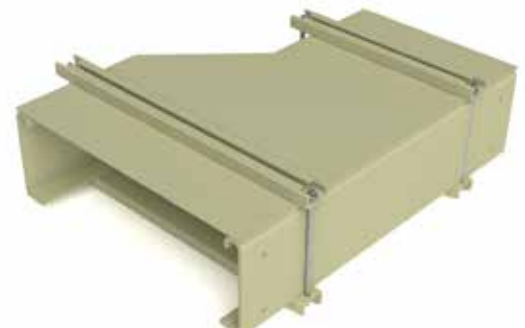
W1 (mm)	W2 (mm)	Description	Code	Weight (kg/pcs)
300	150	KCA GRP K 300/150/ RR/LR	3193721	0,80
400		KCA GRP K 400/150/ RR/LR	3193722	1,00
450		KCA GRP K 450/150/ RR/LR	3193723	1,10
500		KCA GRP K 500/150/ RR/LR	3193724	1,20
600		KCA GRP K 600/150/ RR/LR	3193725	1,40
750		KCA GRP K 750/150/ RR/LR	3193726	1,60
900		KCA GRP K 900/150/ RR/LR	3193727	1,90
300	200	KCA GRP K 300/200/ RR/LR	3193728	0,90
400		KCA GRP K 400/200/ RR/LR	3193729	1,10
450		KCA GRP K 450/200/ RR/LR	3193730	1,20
500		KCA GRP K 500/200/ RR/LR	3193731	1,30
600		KCA GRP K 600/200/ RR/LR	3193732	1,40
750		KCA GRP K 750/200/ RR/LR	3193733	1,70
900		KCA GRP K 900/200/ RR/LR	3193734	2,00
400	300	KCA GRP K 400/300/ RR/LR	3193735	1,30
450		KCA GRP K 450/300/ RR/LR	3193736	1,40
500		KCA GRP K 500/300/ RR/LR	3193737	1,50
600		KCA GRP K 600/300/ RR/LR	3193738	1,60
750		KCA GRP K 750/300/ RR/LR	3193739	1,90
900		KCA GRP K 900/300/ RR/LR	3193740	2,10
500	400	KCA GRP K 500/400/ RR/LR	3193741	1,60
600		KCA GRP K 600/400/ RR/LR	3193742	1,80
750		KCA GRP K 750/400/ RR/LR	3193743	2,10
900		KCA GRP K 900/400/ RR/LR	3193744	2,30
600	450	KCA GRP K 600/450/ RR/LR	3193745	1,90
750		KCA GRP K 750/450/ RR/LR	3193746	2,10
900		KCA GRP K 900/450/ RR/LR	3193747	2,40
600	500	KCA GRP K 600/500/ RR/LR	3193748	2,00
750		KCA GRP K 750/500/ RR/LR	3193749	2,20
900		KCA GRP K 900/500/ RR/LR	3193750	2,50
750	600	KCA GRP K 750/600/ RR/LR	3193751	2,40
900		KCA GRP K 900/600/ RR/LR	3193752	2,70
900	750	KCA GRP K 900/750/ RR/LR	3193753	2,90

Assembly

• Standard Cover Clamp



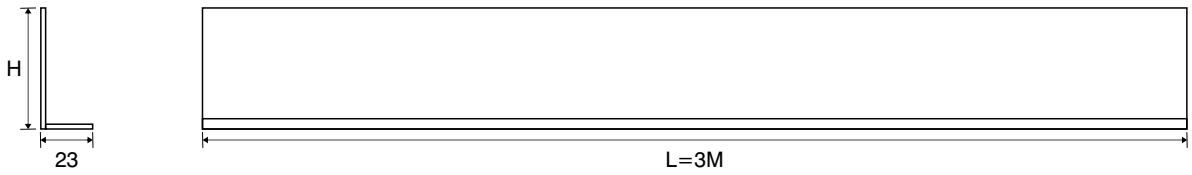
• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Cover Clamps** : Check Page-39-40 for order.

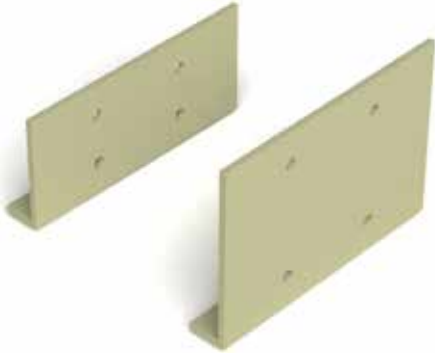
Separator

Code	Description	Height (mm)	Thickness (mm)	Weight (kg/m)
3177485	100 KCA GRP SPR L3M	65	3	0,50
3177486	150 KCA GRP SPR L3M	105	3	0,70



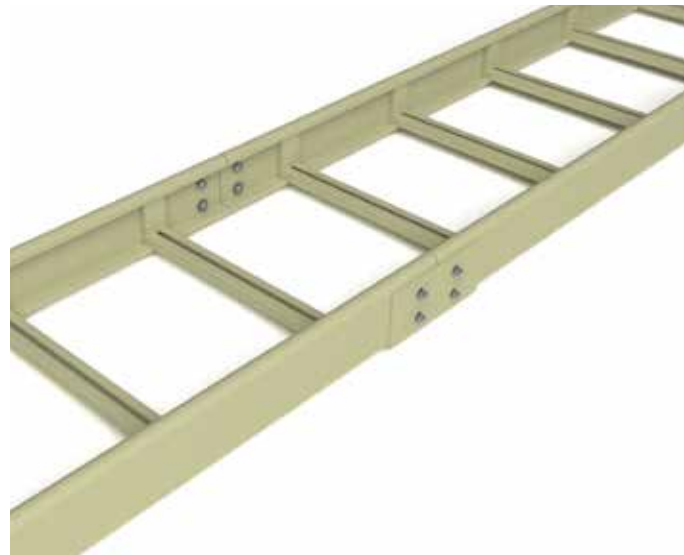
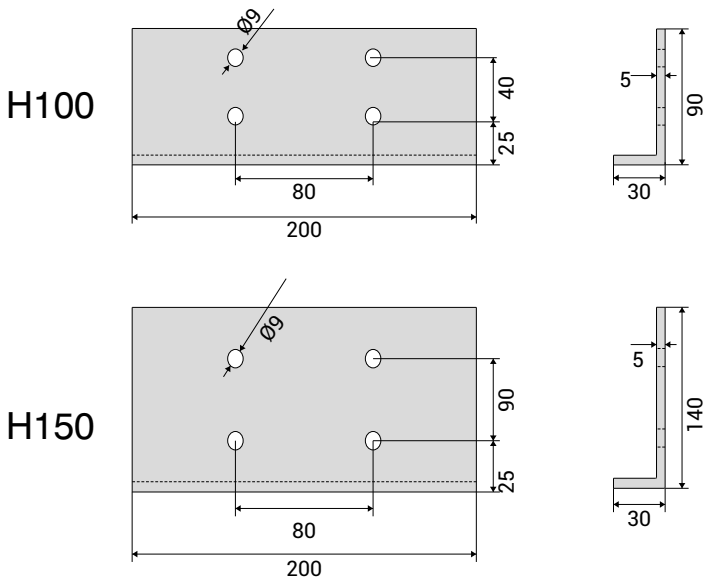
- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Fixing** : 1 set of M6x35 bolt set (SS16) should be ordered separately per meter. (Page-42)

Splice Plate (GRP) Pultruded, delivered pre-drilled holes



Description	Height (mm)	Length (mm)	Thickness (mm)	Required fixing set (SS316)	Weight (kg/pcs)	Code
100 KCA/CTA GRP Splice Plate-GRP	90	200	5,0	4 sets M8x25	0,21	3177483
150 KCA/CTA GRP Splice Plate-GRP	140	200	5,0	4 sets M8x25	0,30	3177484

Dimensions:



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Others available upon request)
- **Fixing** : 4 sets of M8x25 SS316 (Page-42) (Should be ordered separately.)

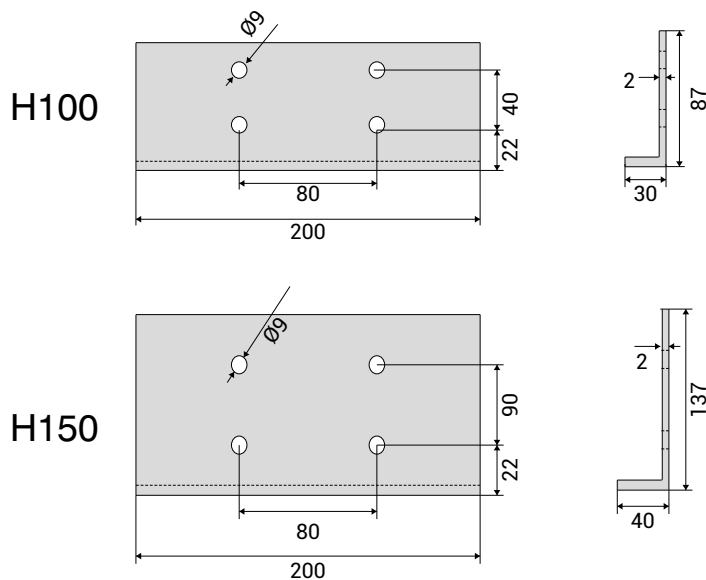
Splice Plate (GRP)

Pultruded, delivered pre-drilled holes



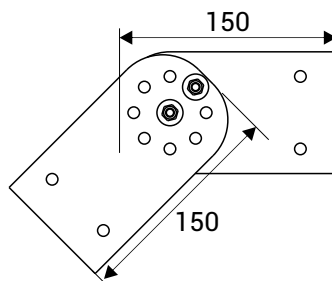
Description	Height (mm)	Length (mm)	Thickness (mm)	Required fixing set (SS316)	Weight (kg/pcs)	Code
100 KCA/CTA GRP Splice Plate-SS	87	200	2,0	4 sets M8x25	0,37	3178719
150 KCA/CTA GRP Splice Plate-SS	137	200	2,0	4 sets M8x25	0,56	3178720

Dimensions:



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL 7032) (Others available upon request)
- **Fixing** : 4 sets of M8x25 SS316 (Page-42) (Should be ordered separately.)

Vertical Adjustable Splice Plate

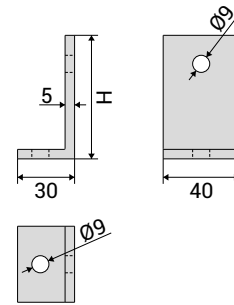


Description	Height (mm)	Thickness (mm)	Weight (kg/set)	Code
100 KCA GRP SDE	100	5	0,29	3177487
150 KCA GRP SDE	150	5	0,46	3177488

Fixing Clamp



Description	Material	Height (mm)	Weight (kg/set)	Order Code
H100 Fixing Clamp (GRP)	GRP	65	0,080	1027017
H150 Fixing Clamp (GRP)	GRP	100	0,100	1027286

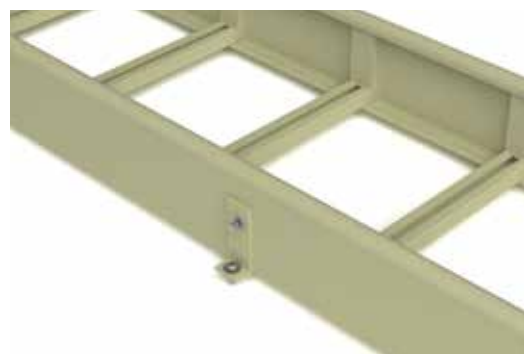


Assembly

H100



H150



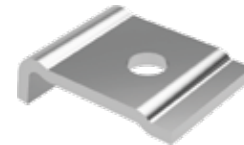
Cover Clamp - Stainless Steel

Description	Material	Order Code	Weight
50 KCA/CTA GRP Cover Clamp SS	Stainless Steel	1027009	0,020
80 KCA/CTA GRP Cover Clamp SS	Stainless Steel	1027010	0,025
100 KCA/CTA GRP Cover Clamp SS	Stainless Steel	1025642	0,030
150 KCA/CTA GRP Cover Clamp SS	Stainless Steel	1025643	0,040



Fasteners - Hold Down Clamp

Description	Material	Order Code	Weight
STK Bracket SS316	Stainless Steel	2080858	0,070



Fasteners (Stainless Steel 316) Bolt Sets

Description	Material	Order Code	Weight
M6x20 fixing set (SS 316)	SS 316 (A4)	1027011	0,016
M8x25 fixing set (SS 316)	SS 316 (A4)	1027109	0,036



Bolts (DIN 7985)

Description	Material	Order Code	Weight
M6x20 bolt (DIN 7985) (SS 316)	SS 316 (A4)	1027012	0,007
M8x25 bolt (DIN 7985) (SS 316)	SS 316 (A4)	1025647	0,019



Nuts (DIN 934)

Description	Material	Order Code	Weight
M6 Hex. Nut (DIN934) (SS 316)	SS 316 (A4)	1027013	0,003
M8 Hex. Nut (DIN 934) (SS 316)	SS 316 (A4)	1025649	0,005

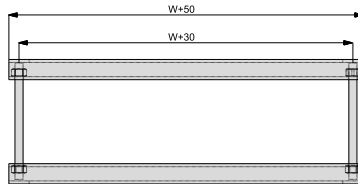


Washers (DIN 9021)

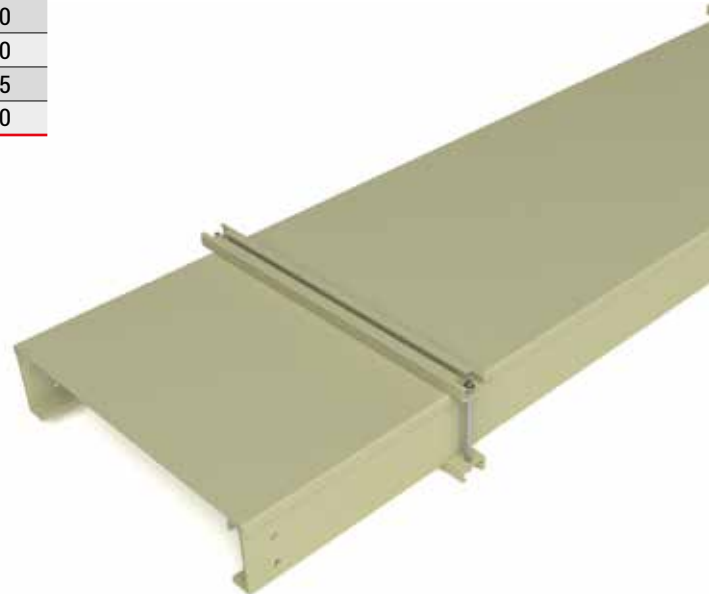
Description	Material	Order Code	Weight
M6 plain washer (DIN 9021) (SS 316)	SS 316 (A4)	1027014	0,003
M8 plain washer (DIN 9021) (SS 316)	SS 316 (A4)	1025648	0,006



Heavy Duty Cover Clamp



Description	Height (mm)	Width (mm)	Order Code	Weight (kg/pcs)
100 KCA/CTA GRP 100 Cover Clamp-HD	100	100	3210215	0,35
100 KCA/CTA GRP 150 Cover Clamp-HD	100	150	3210216	0,40
100 KCA/CTA GRP 200 Cover Clamp-HD	100	200	3210217	0,45
100 KCA/CTA GRP 250 Cover Clamp-HD	100	250	3210218	0,50
100 KCA/CTA GRP 300 Cover Clamp-HD	100	300	3210219	0,55
100 KCA/CTA GRP 400 Cover Clamp-HD	100	400	3210220	0,70
100 KCA/CTA GRP 450 Cover Clamp-HD	100	450	3210221	0,75
100 KCA/CTA GRP 500 Cover Clamp-HD	100	500	3210222	0,80
100 KCA/CTA GRP 600 Cover Clamp-HD	100	600	3210223	0,90
100 KCA/CTA GRP 750 Cover Clamp-HD	100	500	3210406	1,05
100 KCA/CTA GRP 900 Cover Clamp-HD	100	600	3210407	1,20
150 KCA/CTA GRP 150 Cover Clamp-HD	150	150	3210408	0,40
150 KCA/CTA GRP 200 Cover Clamp-HD	150	200	3210409	0,45
150 KCA/CTA GRP 250 Cover Clamp-HD	150	250	3210410	0,50
150 KCA/CTA GRP 300 Cover Clamp-HD	150	300	3210411	0,60
150 KCA/CTA GRP 400 Cover Clamp-HD	150	400	3210412	0,65
150 KCA/CTA GRP 450 Cover Clamp-HD	150	450	3210413	0,70
150 KCA/CTA GRP 500 Cover Clamp-HD	150	500	3210414	0,80
150 KCA/CTA GRP 600 Cover Clamp-HD	150	600	3210415	0,90
150 KCA/CTA GRP 750 Cover Clamp-HD	150	500	3210416	1,05
150 KCA/CTA GRP 900 Cover Clamp-HD	150	600	3210417	1,20



- **Material & QTY** : Profiles: GRP (2 pcs)
 Threaded rod: M8, SS316 (2 pcs)
 Nut: M8, SS316 (4 pcs)

NON-METALLIC CABLE TRAY

PART1 – SCOPE

This specification covers the minimum requirements for design, manufacture, testing, and supply of Fiberglass Reinforced Plastic (KCA GRP) cable trays, necessary hardware, accessories and fittings etc. suitable for indoor/outdoor installations, required for cable laying.

- KCA GRP cable trays shall be designed and manufactured meeting the requirements of NEMA FG-1 and ASTM E-84.
- All cable trays and accessories shall be corrosion/ chemical resistant, weather resistant, easy to drill and cut, lightweight, high strength and flame retardant (Class 1 Rating) in accordance with ASTM E-84. All the composite materials shall have UV light inhibiting chemical additives to resist degradation from ultra violet light. All composite materials shall have Halogen-free properties.

DESIGN & DEFLECTION

- E-Line KCA GRP/GRP Fiberglass reinforced cable ladder sections are designed and manufactured to achieve the loading requirements of the NEMA VE-1 and IEC 61537, and are available in various load and span performances up to 6 meters span.
- All reported results are based on uniformly distributed static loads, single-span configuration for NEMA VE-1 load testing and multispans configuration for IEC 61537 load testing.
- 100 mm height KCA GRP ladders are NEMA 16C classified and 150 mm height KCA GRP ladders are NEMA 20C classified.
- All cable support deflections, within this catalogue, pertain to continuous cable support systems and do not take into consideration simply supported or end bay sections.
- It should be noted that the positioning of splice joints and loading techniques can significantly impact upon the actual deflection. Refer to NEMA VE2 installation guidelines for further information.
- Special consideration should always be given to live loads resulting from cable pulling to ensure this does not exceed the static cable support load limit.
- All load results detailed in this section have been derived from testing 900mm wide sections of KCA GRP/GRP cable ladders in the various configurations.

PART 2 - PRODUCTS

SPECIFICATIONS FOR EAE CABLE LADDER E-LINE KCA GRP/GRP Series Cable Ladder

1. Cable Ladder Design

- 1.1. Cable ladder shall be designed and manufactured by EAE ELEKTRİK A.S.
- 1.2. General: They shall be complete with installation and mounting accessories of KCA GRP such as bends, tees, crosses, reducers, splices, tray covers and other necessary hardware, fastener etc. defined in the latest NEMA FG-1 standard (U.S.A/Canada) and latest IEC 61537 standard (International standard).
- 1.3. Specially designed and manufactured cable ladder allows easy installation of cables which shall be free from burrs, projections, sharp edges inside where cables can be damaged.
- 1.4. Special designed Pultruded C-shape Side Rails, Pultruded C-shape Rungs, and Pultruded Splice Plates shall be increased the strength of the cable ladder and allow support spacings up to 6 meters.

2. Manufacture and Dimensions.

- 2.1. Ladder Cable Trays shall consist of two longitudinal members (side rails) with transverse members (rungs) via using clip-in composite item to the side rails.
- 2.2. General. KCA GRP/GRP cable ladders are manufactured in metric SI units.
- 2.3. Length. Straight lengths shall be manufactured in 3-meters and 6-meters.
- 2.4. Height. (Side Rail) Overall heights shall be 100mm, and 150mm (loading depths, shall be 75mm, and 125mm, respectively)
- 2.5. Width. Overall widths shall be 150mm, 200mm, 300mm, 400mm, 450mm, 500mm, 600mm, 750mm and 900mm.
- 2.6. Rung spacing. 300mm as standard. Other rungs spacing are possible upon request; 150mm, 200mm, 225 mm, 250 mm. Special clip-in item rung to side rail with GRP/KCA GRP lock part.
- 2.7. Fittings. Various types of fittings are available for supporting horizontal and vertical directional cable route/size changes:
 - Horizontal fittings: elbows, tee, cross, middle-left-right reducers
 - Vertical fittings: inside vertical elbow, outside vertical elbow, angle adjustable elbow
 - Standard Radius: R250, R300 and R600 (250, 300 and 600mm, respectively)
 - Standard angle for horizontal and vertical elbows: 900 (Other angles are possible upon request).

3. Material Properties and Finish.

Straight section structural elements; side rails, rungs and splice plates shall be pultruded from glass fiber reinforced polyester resin as standard and, vinyl ester resin upon request.

3.1. Flame Retardant and Non-Toxic Properties.

The material of construction for Cable Trays, Cable Ladders and Fittings must possess self-extinguishing properties to meet the requirements of ASTM D635 & UL 94.

- The Cable Trays, Cable Ladders and Fittings material characteristics must comply with Class 1 flame rating when it is fire tested against BS 476 Part 7.
- The Cable Trays, Cable Ladders and Fittings must possess a flame-spread index of 25 or less when it is tested in accordance with ASTM E84 Standard.
- Cable Trays / Ladders and Fittings shall have an oxygen index of 28 or greater. The testing requirements of oxygen index shall be in accordance with ISO 4589-2.
- For indoor, accommodation modules and air-conditioned area, the complete Cable Trays / Ladders, Fittings and its constituents shall be low smoke zero halogen type in accordance with ISO 5659-2 and IEC 60754-2.

3.2. UV Resistance Properties

The Cable Trays, Cable Ladders and accessories shall be UV resistant and shall meet requirements of ISO 4582 & ISO 4892. An UV inhibitor shall be included in the resin systems to minimize UV degradation.

3.3. Chemical and Water Resistance Properties

- Cable Trays, Cable Ladders and Fittings shall be resistant to a wide range of organic, inorganic substances, Saliferous and H₂S atmosphere.
- All selected materials for construction shall provide enhanced chemical resistance under the minimum, normal and maximum conditions of temperature and corrosive environment.
- Cable Trays / Ladders and its constituent materials shall not exceed 0.7% of weight increase when subjected to water absorption test for twenty four (24) hours in accordance with ASTM D570.

3.4. Anti-Static Properties

- The resin system shall contain a graphite filler or carbon fiber interwoven matting to prevent the accumulation of static electricity. The selection of the material shall be such that surface resistance shall not exceed 10⁹ Ω in accordance with IEC 60079-0, Section 7.4.

3.5. Surface Quality

- All profiles shall be free from surface defects, which may reduce the standard mechanical properties or reduce the operational life of the material.

3.6. Color

- Pultruded shapes shall have RAL 7032 (Pebble grey) as standard. Other colors are possible upon request.

4. Covers

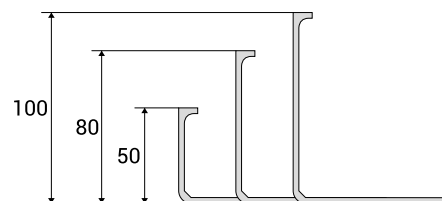
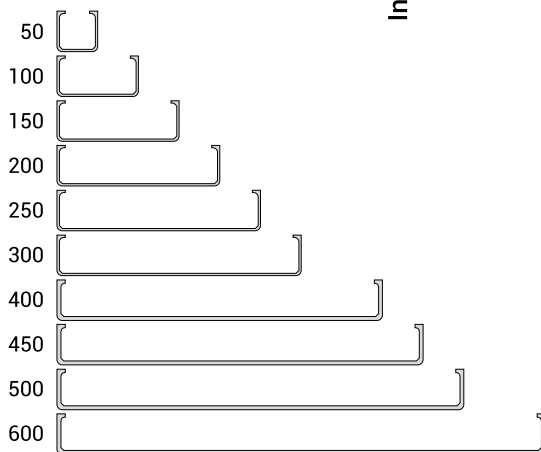
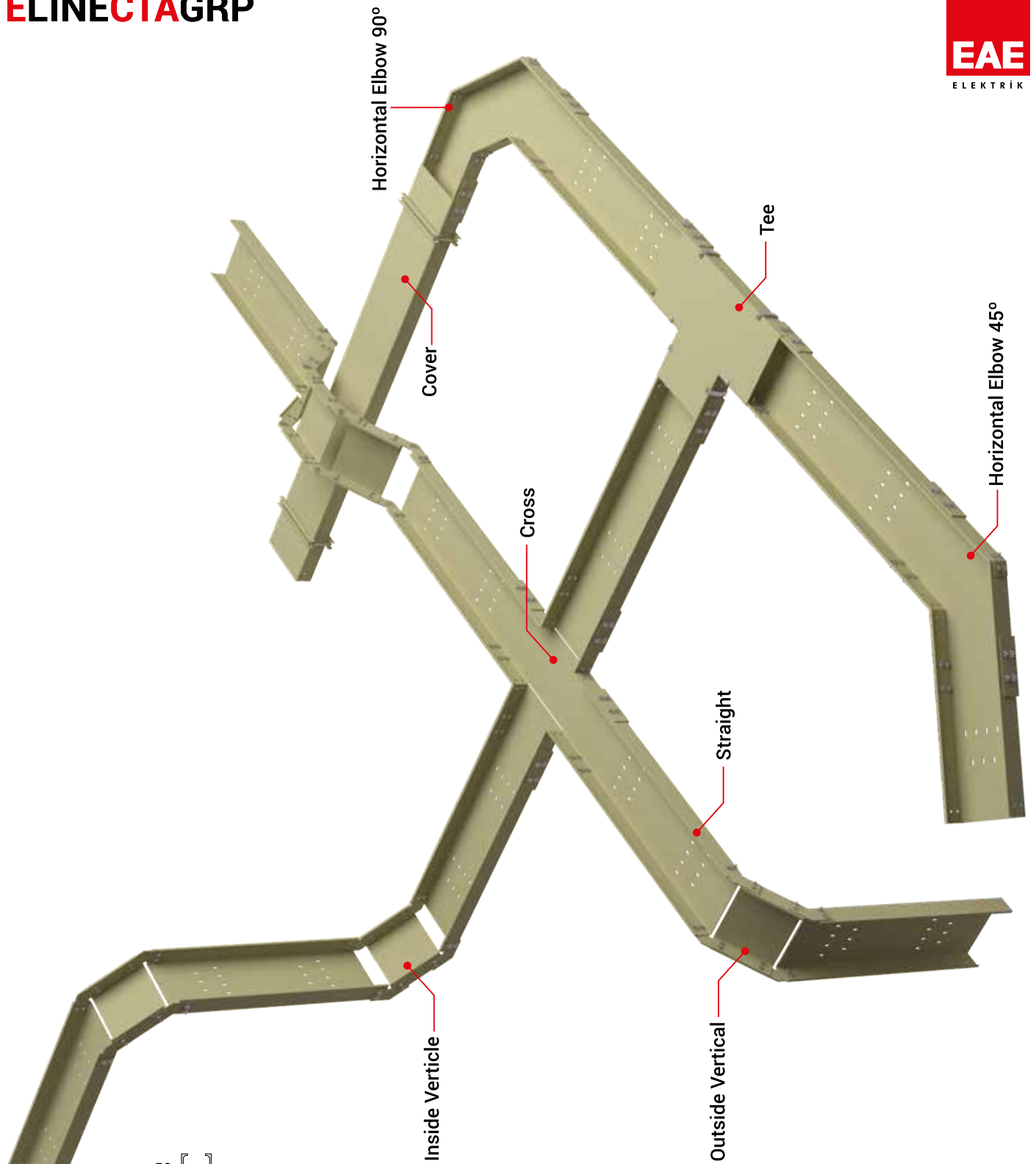
- 4.1. Covers shall be constructed KCA GRP/GRP Composite with a minimum thickness 3mm.
- 4.2. Covers shall be supplied to protect tray cables where needed.
- 4.3. All range of manufactured straight lengths and fittings shall be supplied with their covers upon request.
- 4.4. Perforated and non-perforated type flat and slope covers can be manufactured.
- 4.5. Heavy duty omega type cover clamps shall be used for outdoor applications.

5. Accessories.

- 5.1. Accessories shall be furnished as required to protect, support and install the cable ladder system.
- 5.2. Splice plates, expansion splice plates, horizontal and vertical adjustable couplers, vertical adjustable fitting, dividers, junction box plates as well as fixing fasteners are standard manufactured and supplied accessories by EAE.

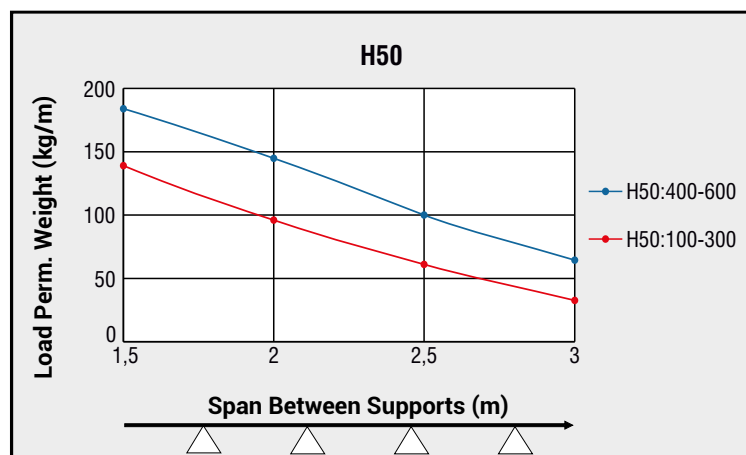
6. Splice plates.

- 6.1. Splice plates shall be fastened to the outside of the cable ladder side-rails.
- 6.2. Bolts, nuts and washers shall be supplied with splice plates. Stainless Steel 316 as standard. Composite fasteners are optional upon request.
- 6.3. Straight and expansion splice plates will be of "L" shaped lay-in design with a four-bolt or eight-bolt pattern.



50 CTA GRP FIBERGLASS REINFORCED POLYESTER Cable Tray

- Side Rail Height (H) : 50mm
- Widths (W) : 50mm, 100mm, 150mm, 200mm, 250mm, 300mm, 400mm, 450mm, 500mm, 600mm
- Standard Rung Spacing : 300mm
- Standard Lengths (L) : 3 meter



• Perforated



• Non-Perforated

- Safe working load values are based on continuous beam test according to IEC 61537 standard.
- Please check Page-10 for effect of temperature on strength.



Perforated		Non-Perforated		Height	Width	Length	Thickness	Weight
Code	Description	Code	Description	(mm)	(mm)	(m)	(mm)	(mm)
3190633	50 CTA GRP 050	3190643	50 CTA-D GRP 050	50	50	3M	3,0	0,85
3190634	50 CTA GRP 100	3190644	50 CTA-D GRP 100	50	100	3M	3,0	1,15
3190635	50 CTA GRP 150	3190645	50 CTA-D GRP 150	50	150	3M	3,0	1,40
3190636	50 CTA GRP 200	3190646	50 CTA-D GRP 200	50	200	3M	3,0	1,65
3190637	50 CTA GRP 250	3190647	50 CTA-D GRP 250	50	250	3M	3,0	1,90
3190638	50 CTA GRP 300	3190648	50 CTA-D GRP 300	50	300	3M	3,0	2,15
3190639	50 CTA GRP 400	3190649	50 CTA-D GRP 400	50	400	3M	4,5	3,95
3190640	50 CTA GRP 450	3190650	50 CTA-D GRP 450	50	450	3M	4,5	4,35
3190641	50 CTA GRP 500	3190651	50 CTA-D GRP 500	50	500	3M	4,5	4,75
3190642	50 CTA GRP 600	3190652	50 CTA-D GRP 600	50	600	3M	4,5	5,55

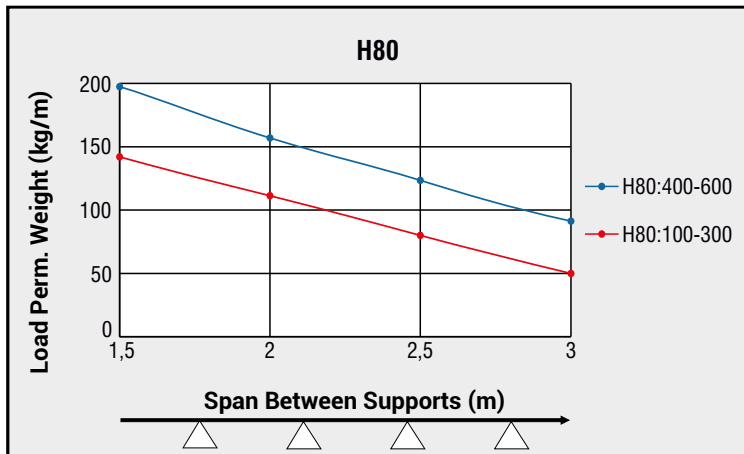
- Material : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- Color : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- Connectors : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- Fasteners : 4 sets M8x25 SS316 (Page-69)
- Covers : Available upon request (Page-57)

Straight Length

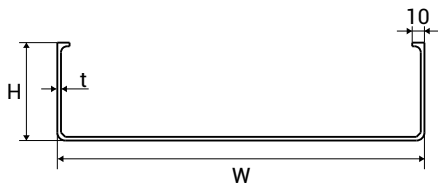
CTA GRP

80 CTA GRP FIBERGLASS REINFORCED POLYESTER Cable Tray

- Side Rail Height (H) : 80mm
- Widths (W) : 100mm, 150mm, 200mm, 250mm, 300mm, 400mm, 450mm, 500mm, 600mm
- Standard Rung Spacing : 300mm
- Standard Lengths (L) : 3 meter



- Safe working load values are based on continuous beam test according to IEC 61537 standard.
- Please check Page-10 for effect of temperature on strength.



• Perforated



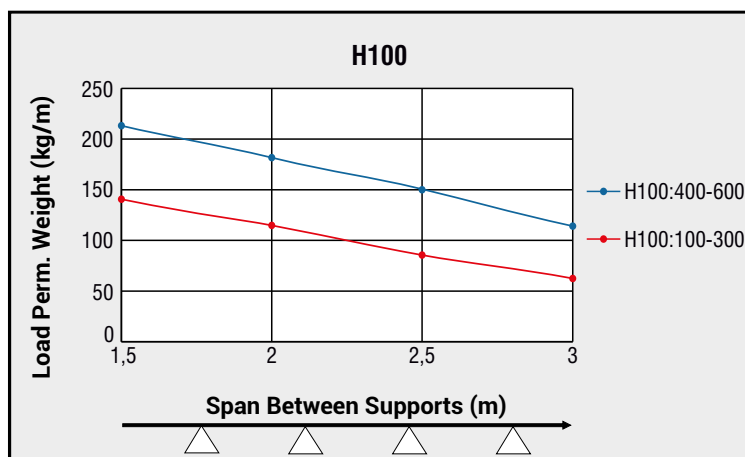
• Non-Perforated

Perforated		Non-Perforated		Height	Width	Length	Thickness	Weight
Code	Description	Code	Description	(mm)	(mm)	(m)	(mm)	(mm)
3190653	80 CTA GRP 100	3190662	80 CTA-D GRP 100	80	100	3M	3,0	1,45
3190654	80 CTA GRP 150	3190663	80 CTA-D GRP 150	80	150	3M	3,0	1,70
3190655	80 CTA GRP 200	3190664	80 CTA-D GRP 200	80	200	3M	3,0	1,95
3190656	80 CTA GRP 250	3190665	80 CTA-D GRP 250	80	250	3M	3,0	2,25
3190657	80 CTA GRP 300	3190666	80 CTA-D GRP 300	80	300	3M	3,0	2,50
3190658	80 CTA GRP 400	3190667	80 CTA-D GRP 400	80	400	3M	4,5	4,45
3190659	80 CTA GRP 450	3190668	80 CTA-D GRP 450	80	450	3M	4,5	4,85
3190660	80 CTA GRP 500	3190669	80 CTA-D GRP 500	80	500	3M	4,5	5,20
3190661	80 CTA GRP 600	3190670	80 CTA-D GRP 600	80	600	3M	4,5	6,00

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 4 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-57)

100 CTA GRP FIBERGLASS REINFORCED POLYESTER Cable Tray

- Side Rail Height (H) : 100mm
- Widths (W) : 100mm, 150mm, 200mm, 250mm, 300mm, 400mm, 450mm, 500mm, 600mm
- Standard Rung Spacing : 300mm
- Standard Lengths (L) : 3 meter



• Perforated



• Non-Perforated

- Safe working load values are based on continues beam test according to IEC 61537 standard.
- Please check Page-10 for effect of temperature on strength.

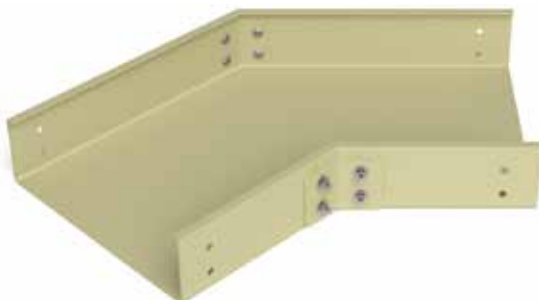


Perforated		Non-Perforated		Height	Width	Length	Thickness	Weight
Code	Description	Code	Description	(mm)	(mm)	(m)	(mm)	(mm)
3190671	100 CTA GRP 100	3190680	100 CTA-D GRP 100	100	100	3M	3,0	1,65
3190672	100 CTA GRP 150	3190681	100 CTA-D GRP 150	100	150	3M	3,0	1,90
3190673	100 CTA GRP 200	3190682	100 CTA-D GRP 200	100	200	3M	3,0	2,15
3190674	100 CTA GRP 250	3190683	100 CTA-D GRP 250	100	250	3M	3,0	2,45
3190675	100 CTA GRP 300	3190684	100 CTA-D GRP 300	100	300	3M	3,0	2,70
3190676	100 CTA GRP 400	3190685	100 CTA-D GRP 400	100	400	3M	4,5	4,75
3190677	100 CTA GRP 450	3190686	100 CTA-D GRP 450	100	450	3M	4,5	5,15
3190678	100 CTA GRP 500	3190687	100 CTA-D GRP 500	100	500	3M	4,5	5,55
3190679	100 CTA GRP 600	3190688	100 CTA-D GRP 600	100	600	3M	4,5	6,35

- Material : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- Color : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- Connectors : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- Fasteners : 4 sets M8x25 SS316 (Page-69)
- Covers : Available upon request (Page-57)

YD45 Horizontal Elbow, 45°

Delivered assembled, pre-drilled hole for connectors



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
50 CTA GRP 050 YD45 / R	50	50	3,0	3190689	3190699	3190709	0,6	0,7	0,8
50 CTA GRP 100 YD45 / R	50	100	3,0	3190690	3190700	3190710	0,7	0,9	1,0
50 CTA GRP 150 YD45 / R	50	150	3,0	3190691	3190701	3190711	0,9	1,1	1,2
50 CTA GRP 200 YD45 / R	50	200	3,0	3190692	3190702	3190712	1,1	1,3	1,5
50 CTA GRP 250 YD45 / R	50	250	3,0	3190693	3190703	3190713	1,2	1,5	1,7
50 CTA GRP 300 YD45 / R	50	300	3,0	3190694	3190704	3190714	1,4	1,7	1,9
50 CTA GRP 400 YD45 / R	50	400	4,5	3190695	3190705	3190715	2,6	3,1	3,6
50 CTA GRP 450 YD45 / R	50	450	4,5	3190696	3190706	3190716	2,9	3,5	4,1
50 CTA GRP 500 YD45 / R	50	500	4,5	3190697	3190707	3190717	3,3	3,9	4,5
50 CTA GRP 600 YD45 / R	50	600	4,5	3190698	3190708	3190718	4,1	4,8	5,4
80 CTA GRP 100 YD45 / R	80	100	3,0	3190719	3190728	3190737	0,9	1,1	1,3
80 CTA GRP 150 YD45 / R	80	150	3,0	3190720	3190729	3190738	1,1	1,3	1,5
80 CTA GRP 200 YD45 / R	80	200	3,0	3190721	3190730	3190739	1,3	1,5	1,7
80 CTA GRP 250 YD45 / R	80	250	3,0	3190722	3190731	3190740	1,5	1,7	2,0
80 CTA GRP 300 YD45 / R	80	300	3,0	3190723	3190732	3190741	1,7	2,0	2,2
80 CTA GRP 400 YD45 / R	80	400	4,5	3190724	3190733	3190742	2,9	3,5	4,0
80 CTA GRP 450 YD45 / R	80	450	4,5	3190725	3190734	3190743	3,3	3,9	4,5
80 CTA GRP 500 YD45 / R	80	500	4,5	3190726	3190735	3190744	3,6	4,3	5,0
80 CTA GRP 600 YD45 / R	80	600	4,5	3190727	3190736	3190745	4,4	5,2	5,9
100 CTA GRP 100 YD45 / R	100	100	3,0	3190746	3190755	3190764	1,1	1,3	1,5
100 CTA GRP 150 YD45 / R	100	150	3,0	3190747	3190756	3190765	1,2	1,5	1,7
100 CTA GRP 200 YD45 / R	100	200	3,0	3190748	3190757	3190766	1,4	1,7	1,9
100 CTA GRP 250 YD45 / R	100	250	3,0	3190749	3190758	3190767	1,6	1,9	2,2
100 CTA GRP 300 YD45 / R	100	300	3,0	3190750	3190759	3190768	1,8	2,1	2,4
100 CTA GRP 400 YD45 / R	100	400	4,5	3190751	3190760	3190769	3,2	3,8	4,3
100 CTA GRP 450 YD45 / R	100	450	4,5	3190752	3190761	3190770	3,5	4,2	4,8
100 CTA GRP 500 YD45 / R	100	500	4,5	3190753	3190762	3190771	3,9	4,6	5,3
100 CTA GRP 600 YD45 / R	100	600	4,5	3190754	3190763	3190772	4,7	5,5	6,3

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 4 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-58)

YD90 Horizontal Elbow, 90°

Delivered assembled, pre-drilled hole for connectors

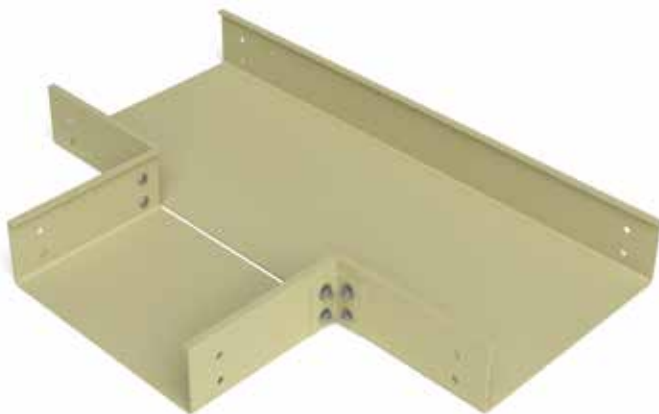


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
50 CTA GRP 050 YD90/R	50	50	3,0	3190773	3190783	3190793	1,0	1,2	1,4
50 CTA GRP 100 YD90/R	50	100	3,0	3190774	3190784	3190794	1,2	1,5	1,7
50 CTA GRP 150 YD90/R	50	150	3,0	3190775	3190785	3190795	1,5	1,8	2,1
50 CTA GRP 200 YD90/R	50	200	3,0	3190776	3190786	3190796	1,7	2,2	2,6
50 CTA GRP 250 YD90/R	50	250	3,0	3190777	3190787	3190797	2,0	2,5	3,0
50 CTA GRP 300 YD90/R	50	300	3,0	3190778	3190788	3190798	2,4	2,9	3,4
50 CTA GRP 400 YD90/R	50	400	4,5	3190779	3190789	3190799	4,4	5,4	6,4
50 CTA GRP 450 YD90/R	50	400	4,5	3190780	3190790	3190800	5,0	6,1	7,1
50 CTA GRP 500 YD90/R	50	500	4,5	3190781	3190791	3190801	5,6	6,7	8,0
50 CTA GRP 600 YD90/R	50	600	4,5	3190782	3190792	3190802	6,9	8,3	9,7
80 CTA GRP 100 YD90/R	80	100	3,0	3190803	3190812	3190821	1,5	1,9	2,2
80 CTA GRP 150 YD90/R	80	150	3,0	3190804	3190813	3190822	1,8	2,2	2,7
80 CTA GRP 200 YD90/R	80	200	3,0	3190805	3190814	3190823	2,1	2,6	3,1
80 CTA GRP 250 YD90/R	80	200	3,0	3190806	3190815	3190824	2,4	3,0	3,5
80 CTA GRP 300 YD90/R	80	300	3,0	3190807	3190816	3190825	2,8	3,4	4,0
80 CTA GRP 400 YD90/R	80	400	4,5	3190808	3190817	3190826	5,0	6,1	7,2
80 CTA GRP 450 YD90/R	80	400	4,5	3190809	3190818	3190827	5,7	6,8	8,0
80 CTA GRP 500 YD90/R	80	500	4,5	3190810	3190819	3190828	6,2	7,5	8,8
80 CTA GRP 600 YD90/R	80	600	4,5	3190811	3190820	3190829	7,6	9,1	10,6
100 CTA GRP 100 YD90/R	100	100	3,0	3190830	3190839	3190848	1,8	2,2	2,5
100 CTA GRP 150 YD90/R	100	150	3,0	3190831	3190840	3190849	2,1	2,5	3,0
100 CTA GRP 200 YD90/R	100	200	3,0	3190832	3190841	3190850	2,3	2,9	3,4
100 CTA GRP 250 YD90/R	100	250	3,0	3190833	3190842	3190851	2,7	3,3	3,9
100 CTA GRP 300 YD90/R	100	300	3,0	3190834	3190843	3190852	3,0	3,7	4,4
100 CTA GRP 400 YD90/R	100	400	4,5	3190835	3190844	3190853	5,3	6,5	7,7
100 CTA GRP 450 YD90/R	100	450	4,5	3190836	3190845	3190854	6,0	7,2	8,5
100 CTA GRP 500 YD90/R	100	500	4,5	3190837	3190846	3190855	6,6	8,0	9,4
100 CTA GRP 600 YD90/R	100	600	4,5	3190838	3190847	3190856	8,0	9,6	11,2

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 4 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-59)

YT Horizontal Tee Fitting

Delivered assembled, pre-drilled hole for connectors



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
50 CTA GRP 050 YT	50	50	3,0	3190857	0,8
50 CTA GRP 100 YT	50	100	3,0	3190858	1,0
50 CTA GRP 150 YT	50	150	3,0	3190859	1,2
50 CTA GRP 200 YT	50	200	3,0	3190860	1,5
50 CTA GRP 250 YT	50	200	3,0	3190861	1,8
50 CTA GRP 300 YT	50	300	3,0	3190862	2,1
50 CTA GRP 400 YT	50	400	4,5	3190863	4,1
50 CTA GRP 450 YT	50	400	4,5	3190864	4,7
50 CTA GRP 500 YT	50	500	4,5	3190865	5,3
50 CTA GRP 600 YT	50	600	4,5	3190866	6,7
80 CTA GRP 100 YT	80	100	3,0	3190867	1,3
80 CTA GRP 150 YT	80	150	3,0	3190868	1,5
80 CTA GRP 200 YT	80	200	3,0	3190869	1,8
80 CTA GRP 250 YT	80	200	3,0	3190870	2,1
80 CTA GRP 300 YT	80	300	3,0	3190871	2,4
80 CTA GRP 400 YT	80	400	4,5	3190872	4,5
80 CTA GRP 450 YT	80	400	4,5	3190873	5,1
80 CTA GRP 500 YT	80	500	4,5	3190874	5,8
80 CTA GRP 600 YT	80	600	4,5	3190875	7,2
100 CTA GRP 100 YT	100	100	3,0	3190876	1,5
100 CTA GRP 150 YT	100	150	3,0	3190877	1,7
100 CTA GRP 200 YT	100	200	3,0	3190878	2,0
100 CTA GRP 250 YT	100	200	3,0	3190879	2,3
100 CTA GRP 300 YT	100	300	3,0	3190880	2,6
100 CTA GRP 400 YT	100	400	4,5	3190881	4,8
100 CTA GRP 450 YT	100	400	4,5	3190882	5,4
100 CTA GRP 500 YT	100	500	4,5	3190883	6,1
100 CTA GRP 600 YT	100	600	4,5	3190884	7,5

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 4 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-60)

AD Horizontal Cross Fitting

Delivered assembled, pre-drilled hole for connectors

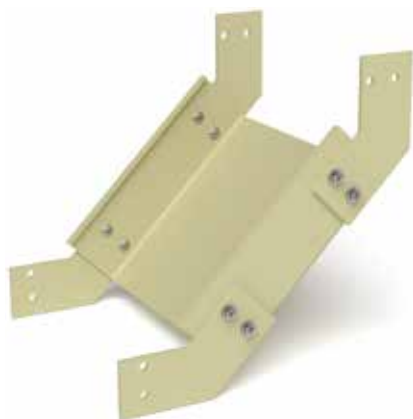


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
50 CTA GRP 050 AD	50	50	3,0	3190885	1,2
50 CTA GRP 100 AD	50	100	3,0	3190886	1,4
50 CTA GRP 150 AD	50	150	3,0	3190887	1,7
50 CTA GRP 200 AD	50	200	3,0	3190888	2,0
50 CTA GRP 250 AD	50	200	3,0	3190889	2,3
50 CTA GRP 300 AD	50	300	3,0	3190890	2,6
50 CTA GRP 400 AD	50	400	4,5	3190891	4,9
50 CTA GRP 450 AD	50	400	4,5	3190892	5,6
50 CTA GRP 500 AD	50	500	4,5	3190893	6,3
50 CTA GRP 600 AD	50	600	4,5	3190894	7,8
80 CTA GRP 100 AD	80	100	3,0	3190895	1,8
80 CTA GRP 150 AD	80	150	3,0	3190896	2,1
80 CTA GRP 200 AD	80	200	3,0	3190897	2,4
80 CTA GRP 250 AD	80	200	3,0	3190898	2,7
80 CTA GRP 300 AD	80	300	3,0	3190899	3,0
80 CTA GRP 400 AD	80	400	4,5	3190900	5,4
80 CTA GRP 450 AD	80	400	4,5	3190901	6,1
80 CTA GRP 500 AD	80	500	4,5	3190902	6,8
80 CTA GRP 600 AD	80	600	4,5	3190903	8,3
100 CTA GRP 100 AD	100	100	3,0	3190904	2,1
100 CTA GRP 150 AD	100	150	3,0	3190905	2,3
100 CTA GRP 200 AD	100	200	3,0	3190906	2,6
100 CTA GRP 250 AD	100	200	3,0	3190907	3,0
100 CTA GRP 300 AD	100	300	3,0	3190908	3,3
100 CTA GRP 400 AD	100	400	4,5	3190909	5,8
100 CTA GRP 450 AD	100	400	4,5	3190910	6,4
100 CTA GRP 500 AD	100	500	4,5	3190911	7,1
100 CTA GRP 600 AD	100	600	4,5	3190912	8,6

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 12 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-61)

ID90 Vertical Inside Riser, 90°

Delivered assembled, pre-drilled hole for connectors

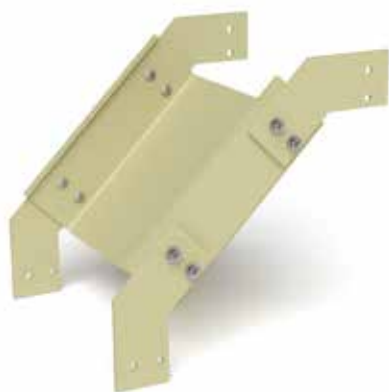


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
50 CTA GRP 050 ID90/R	50	50	3,0	3190913	3190923	3190933	0,5	0,6	0,7
50 CTA GRP 100 ID90/R	50	100	3,0	3190914	3190924	3190933	0,6	0,7	0,9
50 CTA GRP 150 ID90/R	50	150	3,0	3190915	3190925	3190935	0,7	0,8	1,0
50 CTA GRP 200 ID90/R	50	200	3,0	3190916	3190926	3190936	0,7	0,9	1,1
50 CTA GRP 250 ID90/R	50	250	3,0	3190917	3190927	3190937	0,8	1,0	1,3
50 CTA GRP 300 ID90/R	50	300	3,0	3190918	3190928	3190938	0,9	1,1	1,4
50 CTA GRP 400 ID90/R	50	400	4,5	3190919	3190929	3190939	1,3	1,8	2,3
50 CTA GRP 450 ID90/R	50	450	4,5	3190920	3190930	3190940	1,4	1,9	2,5
50 CTA GRP 500 ID90/R	50	500	4,5	3190921	3190931	3190941	1,5	2,1	2,7
50 CTA GRP 600 ID90/R	50	600	4,5	3190922	3190932	3190942	1,7	2,4	3,1
80 CTA GRP 100 ID90/R	80	100	3,0	3190943	3190952	3190961	0,9	1,0	1,2
80 CTA GRP 150 ID90/R	80	150	3,0	3190944	3190953	3190962	0,9	1,1	1,4
80 CTA GRP 200 ID90/R	80	200	3,0	3190945	3190954	3190963	1,0	1,2	1,5
80 CTA GRP 250 ID90/R	80	250	3,0	3190946	3190955	3190964	1,1	1,3	1,6
80 CTA GRP 300 ID90/R	80	300	3,0	3190947	3190956	3190965	1,1	1,4	1,7
80 CTA GRP 400 ID90/R	80	400	4,5	3190948	3190957	3190966	1,6	2,2	2,7
80 CTA GRP 450 ID90/R	80	450	4,5	3190949	3190958	3190967	1,7	2,3	2,9
80 CTA GRP 500 ID90/R	80	500	4,5	3190950	3190959	3190968	1,8	2,5	3,1
80 CTA GRP 600 ID90/R	80	600	4,5	3190951	3190960	3190969	2,0	2,8	3,5
100 CTA GRP 100 ID90/R	100	100	3,0	3190970	3190979	3190988	1,0	1,3	1,5
100 CTA GRP 150 ID90/R	100	150	3,0	3190971	3190980	3190989	1,1	1,4	1,6
100 CTA GRP 200 ID90/R	100	200	3,0	3190972	3190981	3190990	1,2	1,5	1,7
100 CTA GRP 250 ID90/R	100	250	3,0	3190973	3190982	3190991	1,25	1,6	1,9
100 CTA GRP 300 ID90/R	100	300	3,0	3190974	3190983	3190992	1,3	1,7	2,0
100 CTA GRP 400 ID90/R	100	400	4,5	3190975	3190984	3190993	1,8	2,4	3,0
100 CTA GRP 450 ID90/R	100	450	4,5	3190976	3190985	3190994	1,9	2,6	3,2
100 CTA GRP 500 ID90/R	100	500	4,5	3190977	3190986	3190995	2,0	2,7	3,4
100 CTA GRP 600 ID90/R	100	600	4,5	3190978	3190987	3190996	2,2	3,0	3,8

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-34-65)
- **Fasteners** : 12 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-62)

DD90 Vertical Outside Riser, 90°

Delivered assembled, pre-drilled hole for connectors

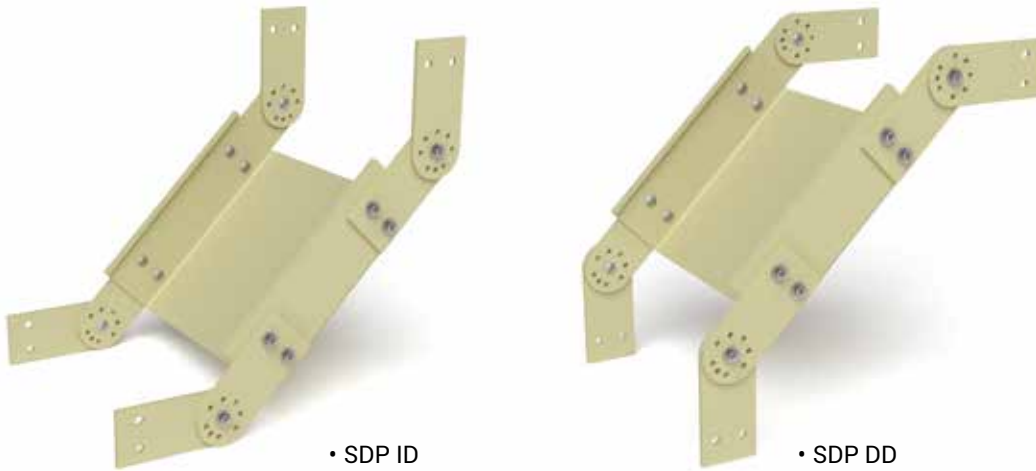


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
50 CTA GRP 050 DD90/R	50	50	3,0	3190997	3191007	3191017	0,5	0,6	0,7
50 CTA GRP 100 DD90/R	50	100	3,0	3190998	3191008	3191018	0,6	0,7	0,9
50 CTA GRP 150 DD90/R	50	150	3,0	3190999	3191009	3191019	0,7	0,8	1,0
50 CTA GRP 200 DD90/R	50	200	3,0	3191000	3191010	3191020	0,7	0,9	1,1
50 CTA GRP 250 DD90/R	50	250	3,0	3191001	3191011	3191021	0,8	1,0	1,3
50 CTA GRP 300 DD90/R	50	300	3,0	3191002	3191012	3191022	0,9	1,1	1,4
50 CTA GRP 400 DD90/R	50	400	4,5	3191003	3191013	3191023	1,3	1,8	2,3
50 CTA GRP 450 DD90/R	50	450	4,5	3191004	3191014	3191024	1,4	1,9	2,5
50 CTA GRP 500 DD90/R	50	500	4,5	3191005	3191015	3191025	1,5	2,1	2,7
50 CTA GRP 600 DD90/R	50	600	4,5	3191006	3191016	3191026	1,7	2,4	3,1
80 CTA GRP 100 DD90/R	80	100	3,0	3191027	3191036	3191027	0,9	1,0	1,2
80 CTA GRP 150 DD90/R	80	150	3,0	3191028	3191037	3191046	0,9	1,1	1,4
80 CTA GRP 200 DD90/R	80	200	3,0	3191029	3191038	3191047	1,0	1,2	1,5
80 CTA GRP 250 DD90/R	80	250	3,0	3191030	3191039	3191048	1,1	1,3	1,6
80 CTA GRP 300 DD90/R	80	300	3,0	3191031	3191040	3191049	1,1	1,4	1,7
80 CTA GRP 400 DD90/R	80	400	4,5	3191032	3191041	3191050	1,6	2,2	2,7
80 CTA GRP 450 DD90/R	80	450	4,5	3191033	3191042	3191051	1,7	2,3	2,9
80 CTA GRP 500 DD90/R	80	500	4,5	3191034	3191043	3191052	1,8	2,5	3,1
80 CTA GRP 600 DD90/R	80	600	4,5	3191035	3191044	3191053	2,0	2,8	3,5
100 CTA GRP 100 DD90/R	100	100	3,0	3191054	3191063	3191072	1,0	1,3	1,5
100 CTA GRP 150 DD90/R	100	150	3,0	3191055	3191064	3191073	1,1	1,4	1,6
100 CTA GRP 200 DD90/R	100	200	3,0	3191056	3191065	3191074	1,2	1,5	1,7
100 CTA GRP 250 DD90/R	100	250	3,0	3191057	3191066	3191075	1,25	1,6	1,9
100 CTA GRP 300 DD90/R	100	300	3,0	3191058	3191067	3191076	1,3	1,7	2,0
100 CTA GRP 400 DD90/R	100	400	4,5	3191059	3191068	3191077	1,8	2,4	3,0
100 CTA GRP 450 DD90/R	100	450	4,5	3191060	3191069	3191078	1,9	2,6	3,2
100 CTA GRP 500 DD90/R	100	500	4,5	3191061	3191070	3191079	2,0	2,7	3,4
100 CTA GRP 600 DD90/R	100	600	4,5	3191062	3191071	3191080	2,2	3,0	3,8

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 12 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-62)

SDP Flexible Vertical Riser Piece

Delivered assembled, pre-drilled hole for connectors



• SDP ID

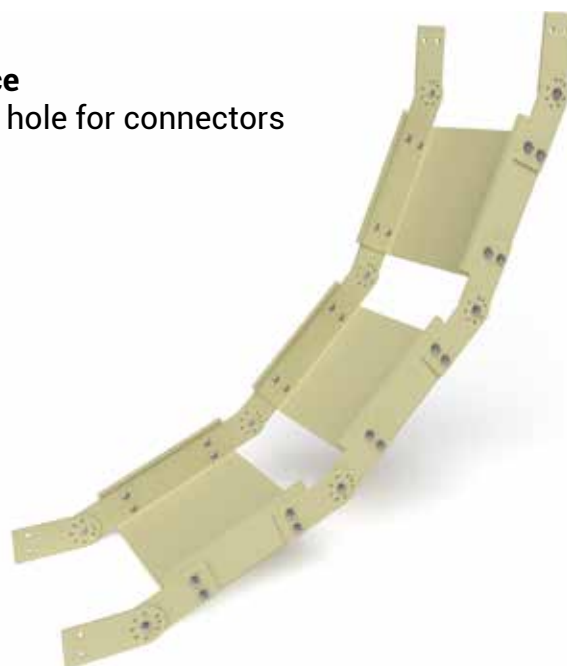
• SDP DD

Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
50 CTA GRP 050 SDP	50	50	3,0	3191081	0,7
50 CTA GRP 100 SDP	50	100	3,0	3191082	0,8
50 CTA GRP 150 SDP	50	150	3,0	3191083	0,85
50 CTA GRP 200 SDP	50	200	3,0	3191084	0,9
50 CTA GRP 250 SDP	50	200	3,0	3191085	1,0
50 CTA GRP 300 SDP	50	300	3,0	3191086	1,1
50 CTA GRP 400 SDP	50	400	4,5	3191087	1,5
50 CTA GRP 450 SDP	50	400	4,5	3191088	1,6
50 CTA GRP 500 SDP	50	500	4,5	3191089	1,7
50 CTA GRP 600 SDP	50	600	4,5	3191090	1,9
80 CTA GRP 100 SDP	80	100	3,0	3191091	1,15
80 CTA GRP 150 SDP	80	150	3,0	3191092	1,2
80 CTA GRP 200 SDP	80	200	3,0	3191093	1,3
80 CTA GRP 250 SDP	80	200	3,0	3191094	1,35
80 CTA GRP 300 SDP	80	300	3,0	3191095	1,4
80 CTA GRP 400 SDP	80	400	4,5	3191096	1,9
80 CTA GRP 450 SDP	80	400	4,5	3191097	2,0
80 CTA GRP 500 SDP	80	500	4,5	3191098	2,1
80 CTA GRP 600 SDP	80	600	4,5	3191099	2,3
100 CTA GRP 100 SDP	100	100	3,0	3191100	1,5
100 CTA GRP 150 SDP	100	150	3,0	3191101	1,6
100 CTA GRP 200 SDP	100	200	3,0	3191102	1,7
100 CTA GRP 250 SDP	100	200	3,0	3191103	1,75
100 CTA GRP 300 SDP	100	300	3,0	3191104	1,8
100 CTA GRP 400 SDP	100	400	4,5	3191105	2,3
100 CTA GRP 450 SDP	100	400	4,5	3191106	2,4
100 CTA GRP 500 SDP	100	500	4,5	3191107	2,5
100 CTA GRP 600 SDP	100	600	4,5	3191108	2,7

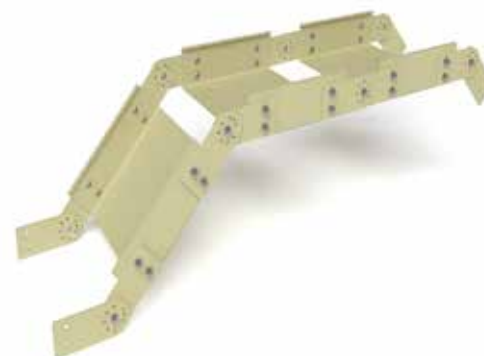
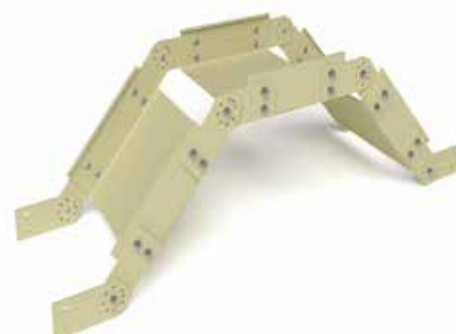
- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 12 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-62)

SDM Flexible Vertical Riser Piece

Delivered assembled, pre-drilled hole for connectors



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
50 CTA GRP 050 SDM	50	50	3,0	3191109	1,7
50 CTA GRP 100 SDM	50	100	3,0	3191110	1,9
50 CTA GRP 150 SDM	50	150	3,0	3191111	2,1
50 CTA GRP 200 SDM	50	200	3,0	3191112	2,2
50 CTA GRP 250 SDM	50	200	3,0	3191113	2,4
50 CTA GRP 300 SDM	50	300	3,0	3191114	2,6
50 CTA GRP 400 SDM	50	400	4,5	3191115	4,0
50 CTA GRP 450 SDM	50	400	4,5	3191116	4,3
50 CTA GRP 500 SDM	50	500	4,5	3191117	4,6
50 CTA GRP 600 SDM	50	600	4,5	3191118	5,2
80 CTA GRP 100 SDM	80	100	3,0	3191119	2,6
80 CTA GRP 150 SDM	80	150	3,0	3191120	2,8
80 CTA GRP 200 SDM	80	200	3,0	3191121	3,1
80 CTA GRP 250 SDM	80	200	3,0	3191122	3,2
80 CTA GRP 300 SDM	80	300	3,0	3191123	3,4
80 CTA GRP 400 SDM	80	400	4,5	3191124	4,9
80 CTA GRP 450 SDM	80	400	4,5	3191125	5,2
80 CTA GRP 500 SDM	80	500	4,5	3191126	5,5
80 CTA GRP 600 SDM	80	600	4,5	3191127	6,1
100 CTA GRP 100 SDM	100	100	3,0	3191128	3,4
100 CTA GRP 150 SDM	100	150	3,0	3191129	3,6
100 CTA GRP 200 SDM	100	200	3,0	3191130	3,8
100 CTA GRP 250 SDM	100	200	3,0	3191131	4,0
100 CTA GRP 300 SDM	100	300	3,0	3191132	4,2
100 CTA GRP 400 SDM	100	400	4,5	3191134	5,8
100 CTA GRP 450 SDM	100	400	4,5	3191135	6,1
100 CTA GRP 500 SDM	100	500	4,5	3191136	6,4
100 CTA GRP 600 SDM	100	600	4,5	3191137	7,0



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Connectors** : GRP as standard. (Stainless steel 316 grade, upon request. Page-64-65)
- **Fasteners** : 8 sets M8x25 SS316 (Page-69)
- **Covers** : Available upon request (Page-62)

YD45 Horizontal Bend, 45° Delivered assembled

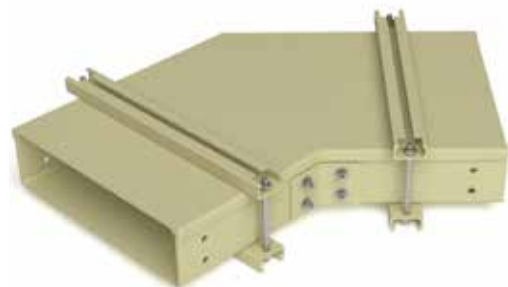
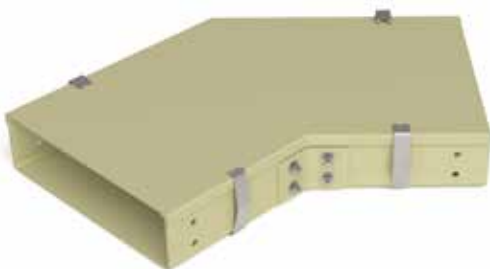


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
CTA GRP K 050 YD45	15	50	3,0	3191150	3191160	3191170	0,3	0,4	0,5
CTA GRP K 100 YD45	15	100	3,0	3191151	3191161	3191171	0,5	0,6	0,7
CTA GRP K 150 YD45	15	150	3,0	3191152	3191162	3191172	0,6	0,7	0,8
CTA GRP K 200 YD45	15	200	3,0	3191153	3191163	3191173	0,8	0,9	1,1
CTA GRP K 250 YD45	15	250	3,0	3191154	3191164	3191174	1,0	1,2	1,3
CTA GRP K 300 YD45	15	300	3,0	3191155	3191165	3191175	1,2	1,4	1,6
CTA GRP K 400 YD45	15	400	3,0	3191156	3191166	3191176	1,6	1,9	2,1
CTA GRP K 450 YD45	15	450	3,0	3191157	3191167	3191177	1,8	2,1	2,5
CTA GRP K 500 YD45	15	500	3,0	3191158	3191168	3191178	2,1	2,4	2,8
CTA GRP K 600 YD45	15	600	3,0	3191159	3191169	3191179	2,6	3,0	3,4

Assembly

• Standard Cover Clamp

• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Covers Clamps** : 4 pcs standard cover clamp (Page-67) or 2 pcs heavy duty cover clamp (Page-68)

YD90 Horizontal Bend Cover, 90°

Delivered assembled



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
CTA GRP K 050 YD90	15	50	3,0	3191180	3191190	3191200	0,5	0,6	0,7
CTA GRP K 100 YD90	15	100	3,0	3191181	3191191	3191201	0,7	0,9	1,0
CTA GRP K 150 YD90	15	150	3,0	3191182	3191192	3191202	1,0	1,2	1,5
CTA GRP K 200 YD90	15	200	3,0	3191183	3191193	3191203	1,3	1,6	1,9
CTA GRP K 250 YD90	15	250	3,0	3191184	3191194	3191204	1,6	2,0	2,3
CTA GRP K 300 YD90	15	300	3,0	3191185	3191195	3191205	1,9	2,4	2,8
CTA GRP K 400 YD90	15	400	3,0	3191186	3191196	3191206	2,7	3,2	3,8
CTA GRP K 450 YD90	15	450	3,0	3191187	3191197	3191207	3,1	3,7	4,3
CTA GRP K 500 YD90	15	500	3,0	3191188	3191198	3191208	3,5	4,2	4,9
CTA GRP K 600 YD90	15	600	3,0	3191189	3191199	3191209	4,4	5,2	6,0

Assembly

• Standard Cover Clamp

• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Covers Clamps** : 4 pcs standard cover clamp (Page-67) or 2 pcs heavy duty cover clamp (Page-68)

Straight Cover

Delivered assembled



Description	Height (mm)	Width (mm)	Length (m)	Thickness (mm)	Order Code	Weight (kg/pcs)
KCA/CTA GRP K 050 / L=3M	15	50	3	3	3191138	0,45
KCA/CTA GRP K 100 / L=3M	15	100	3	3	3191139	0,70
KCA/CTA GRP K 150 / L=3M	15	150	3	3	3177489	0,95
KCA/CTA GRP K 200 / L=3M	15	200	3	3	3177490	1,20
KCA/CTA GRP K 250 / L=3M	15	200	3	3	3191142	1,50
KCA/CTA GRP K 300 / L=3M	15	300	3	3	3177491	1,75
KCA/CTA GRP K 400 / L=3M	15	400	3	3	3177492	2,25
KCA/CTA GRP K 450 / L=3M	15	400	3	3	3177493	2,55
KCA/CTA GRP K 500 / L=3M	15	500	3	3	3177494	2,80
KCA/CTA GRP K 600 / L=3M	15	600	3	3	3177495	3,30
KCA/CTA GRP K 750 / L=3M	15	100	3	3	3177496	4,10
KCA/CTA GRP K 900 / L=3M	15	150	3	3	3177497	4,90

Quantity of Standard Cover Clamps Required

	Standard Cover Clamp	Heavy Duty Cover Clamp
Straight Sections (3M)	6 pcs	3 pcs
Horizontal/Vertical Bends	4 pcs	2 pcs
Tees	6 pcs	3 pcs
Crosses	8 pcs	4 pcs

- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Cover Clamp** : (Page-67-68)
- **Material Thickness** : t=3mm
- **Delivered Length** : L=3m

YT Horizontal Tee Cover

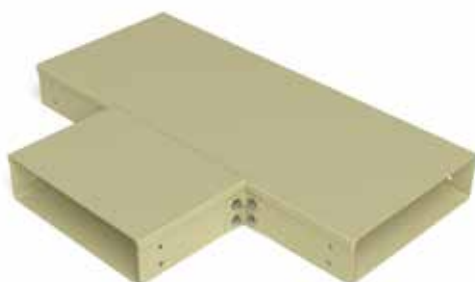
Delivered assembled



Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
CTA GRP K 050 YT	15	50	3	3191210	0,4
CTA GRP K 100 YT	15	100	3	3191211	0,6
CTA GRP K 150 YT	15	150	3	3191212	0,9
CTA GRP K 200 YT	15	200	3	3191213	1,1
CTA GRP K 250 YT	15	200	3	3191214	1,4
CTA GRP K 300 YT	15	300	3	3191215	1,8
CTA GRP K 400 YT	15	400	3	3191216	2,5
CTA GRP K 450 YT	15	400	3	3191217	2,9
CTA GRP K 500 YT	15	100	3	3191218	3,3
CTA GRP K 600 YT	15	150	3	3191219	4,3

Assembly

• Standard Cover Clamp



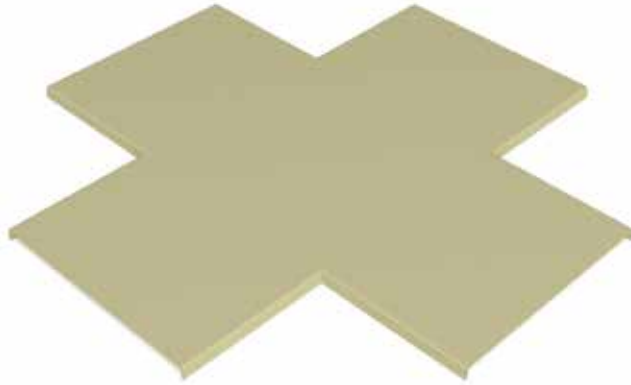
• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Covers Clamps** : 6 pcs standard cover clamp (Page-67) or 3 pcs heavy duty cover clamp (Page-68)

AD Horizontal Cross Cover

Delivered assembled

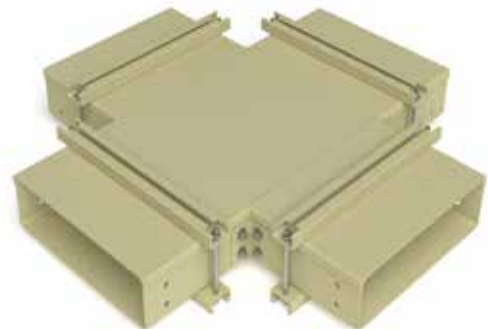
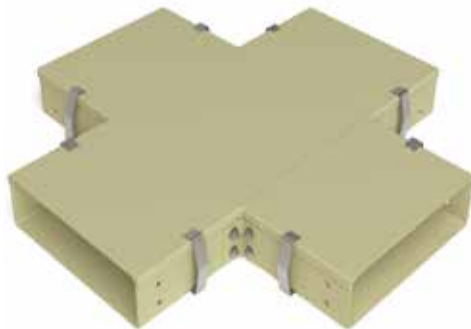


Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
CTA GRP K 050 AD	15	50	3	3191220	0,5
CTA GRP K 100 AD	15	100	3	3191221	0,8
CTA GRP K 150 AD	15	150	3	3191222	1,1
CTA GRP K 200 AD	15	200	3	3191223	1,5
CTA GRP K 250 AD	15	200	3	3191224	1,9
CTA GRP K 300 AD	15	300	3	3191225	2,3
CTA GRP K 400 AD	15	400	3	3191226	3,1
CTA GRP K 450 AD	15	400	3	3191227	3,6
CTA GRP K 500 AD	15	100	3	3191228	4,1
CTA GRP K 600 AD	15	150	3	3191229	5,2

Assembly

• Standard Cover Clamp

• Heavy Duty Cover Clamp



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Covers Clamps** : 8 pcs standard cover clamp (Page-67) or 3 pcs heavy duty cover clamp (Page-68)

Vertical Riser Cover, 90° (ID90, DD90) Delivered assembled



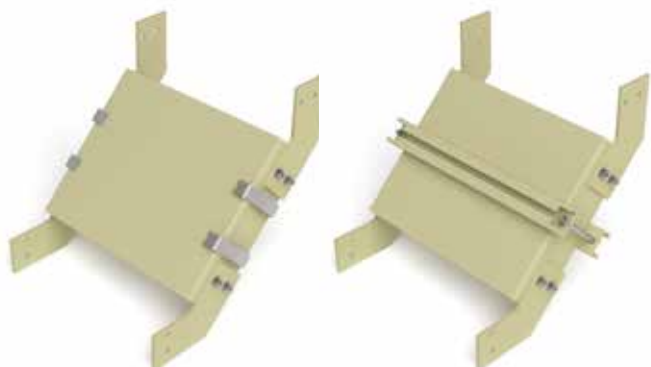
Description	Height (mm)	Width (mm)	Thickness (mm)	Order Code			Weight (kg/pcs)		
				R300	R450	R600	R300	R450	R600
CTA GRP K 050 ID90/DD90/R	15	50	3,0	3191230	3191240	3191250	0,15	0,2	0,25
CTA GRP K 100 ID90/DD90/R	15	100	3,0	3191231	3191241	3191251	0,20	0,3	0,4
CTA GRP K 150 ID90/DD90/R	15	150	3,0	3191232	3191242	3191252	0,25	0,4	0,5
CTA GRP K 200 ID90/DD90/R	15	200	3,0	3191233	3191243	3191253	0,35	0,5	0,65
CTA GRP K 250 ID90/DD90/R	15	250	3,0	3191234	3191244	3191254	0,40	0,6	0,8
CTA GRP K 300 ID90/DD90/R	15	300	3,0	3191235	3191245	3191255	0,50	0,7	0,9
CTA GRP K 400 ID90/DD90/R	15	400	3,0	3191236	3191246	3191256	0,60	0,9	1,2
CTA GRP K 450 ID90/DD90/R	15	450	3,0	3191237	3191247	3191257	0,70	1,0	1,3
CTA GRP K 500 ID90/DD90/R	15	500	3,0	3191238	3191248	3191258	0,75	1,1	1,4
CTA GRP K 600 ID90/DD90/R	15	600	3,0	3191239	3191249	3191259	0,85	1,3	1,7

Assembly

Inside Vertical Riser

• Standard Cover Clamp

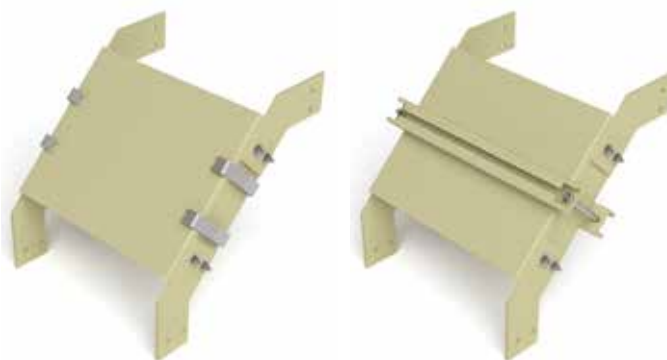
• Heavy Duty Cover Clamp



Inside Vertical Riser

• Standard Cover Clamp

• Heavy Duty Cover Clamp



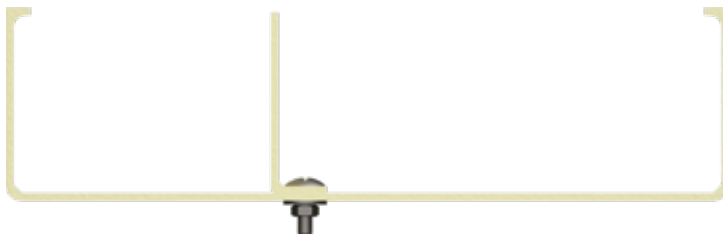
- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Covers Clamps** : 4 pcs standard cover clamp (Page-67) or 2 pcs heavy duty cover clamp (Page-68)

Separator

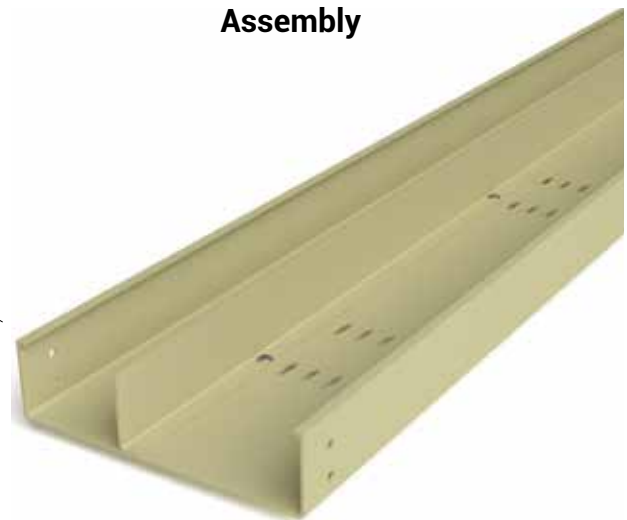
Pultruded, delivered with 3 holes per 3 Meter single length.



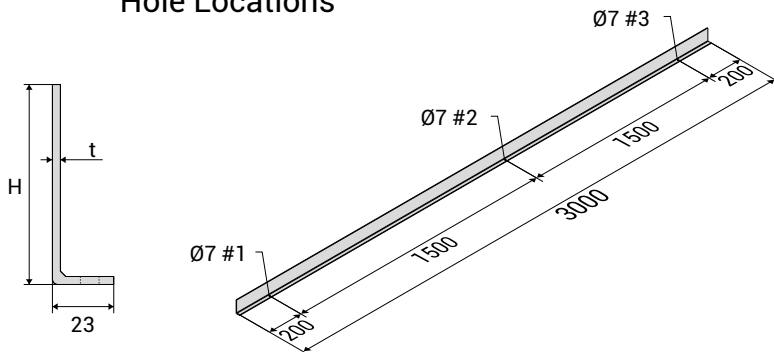
Description	Height (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)
50 CTA GRP SPR /3M	45	3	3191260	0,35
80 CTA GRP SPR /3M	75	3	3191261	0,50
100 CTA GRP SPR /3M	95	3	3191262	0,60



Assembly



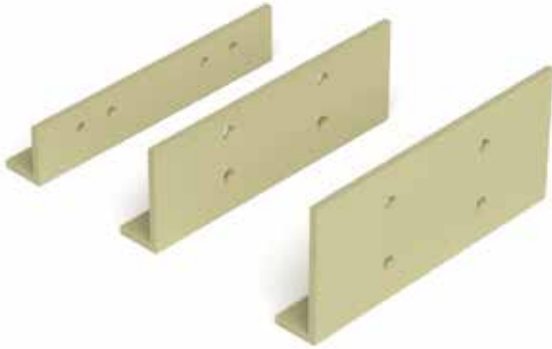
Hole Locations



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (Please, contact for other color options)
- **Fasteners** : Supplied with 1 sets of M6x25 per meter. 1 set includes;
 - 1 pcs M6x25 bolt
 - 1 pcs nut (DIN934)
 - 1 pcs flat washer (DIN9021)

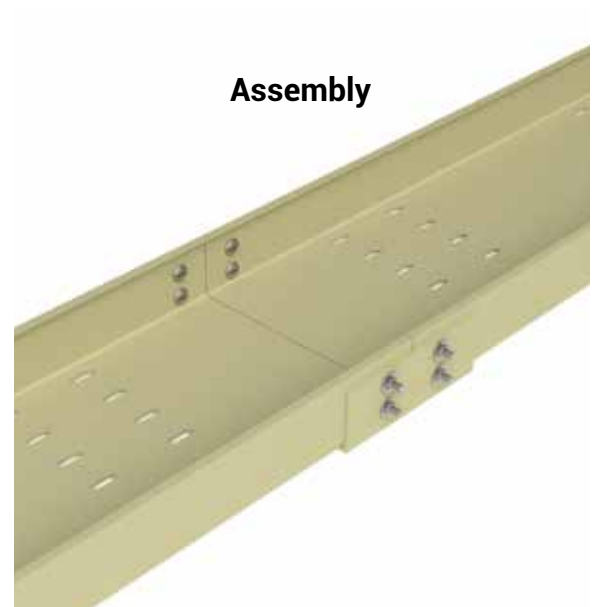
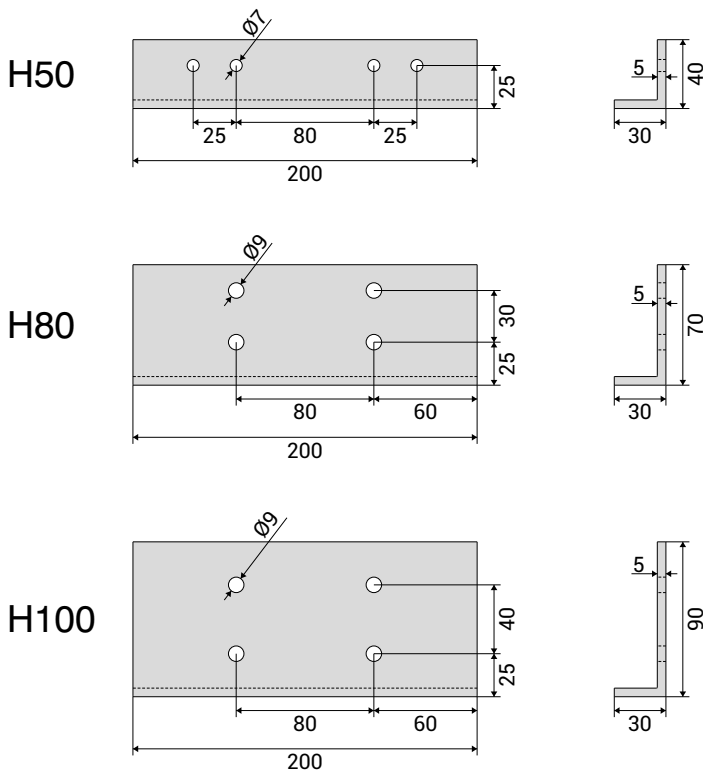
Splice Plate (GRP)

Pultruded, delivered pre-drilled holes



Description	Height (mm)	Length (mm)	Thickness (mm)	Required fixing set (SS316)	Weight (kg/pcs)	Code
50 KCA/CTA GRP Splice Plate-GRP	40	200	2	4 sets M8x25	0,12	3191263
80 KCA/CTA GRP Splice Plate-GRP	70	200	2	4 sets M8x25	0,17	3191264
100 KCA/CTA GRP Splice Plate-GRP	90	200	2	4 sets M8x25	0,21	3177483

Dimensions:



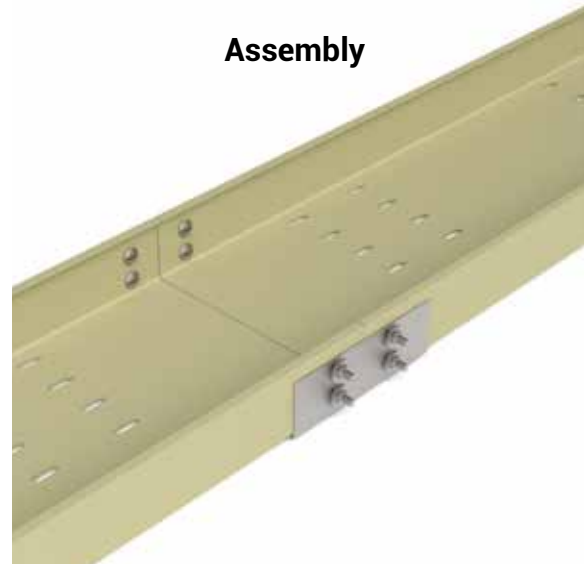
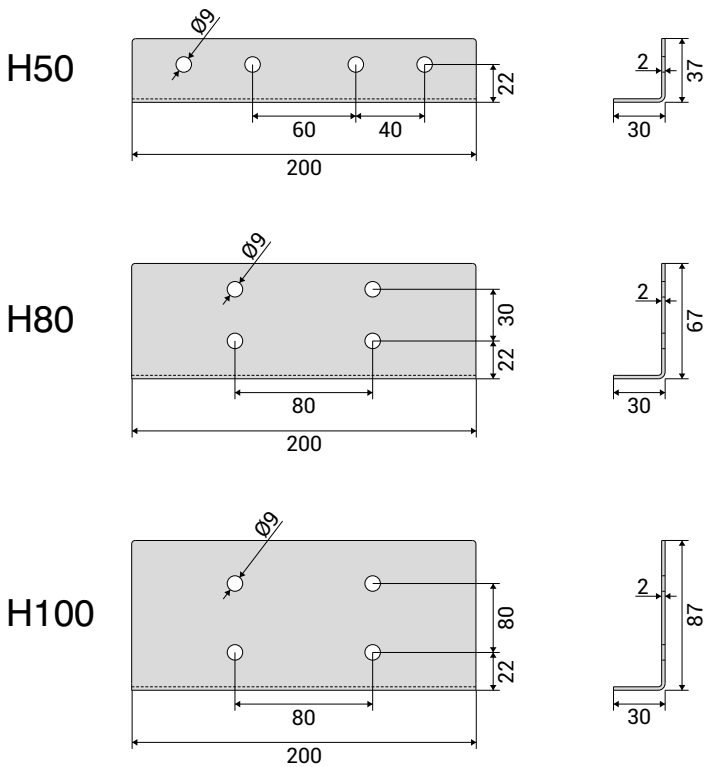
- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL 7032) (Others available upon request)
- **Fixing** : 4 sets of M8x25 SS316 (Page-42) (Should be ordered separately.)

Splice Plate (Stainless Steel)



Description	Height (mm)	Length (mm)	Thickness (mm)	Required fixing set (SS316)	Weight (kg/pcs)	Code
50 KCA/CTA GRP Splice Plate-SS	37	200	2	4 sets M8x25	0,21	3191266
80 KCA/CTA GRP Splice Plate-SS	67	200	2	4 sets M8x25	0,30	3191267
100 KCA/CTA GRP Splice Plate-SS	87	200	2	4 sets M8x25	0,37	3178720

Dimensions:



Assembly

- Material : Stainless Steel Grade 316L
- Fasteners : 4 sets M8x25 SS316 (Page- 69)

Vertical Adjustable Splice Plate

Delivered assembled, with pre-drilled holes



Description	Height (mm)	Thickness (mm)	Order Code	Weight (kg/pcs)	Weight (kg/set)
50 KCA/CTA GRP SDE-GRP	30	5	3191269	0,035	0,09
80 KCA/CTA GRP SDE-GRP	60	5	3191270	0,060	0,18
100 KCA/CTA GRP SDE-GRP	80	5	3177487	0,100	0,27



- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032), SS316 grade, upon request.
- **Fasteners** : 2 sets M6x20 SS316 (Page-69)

Fasteners (Stainless Steel 316)

Bolt Sets

Description	Material	Order Code	Weight (kg/pcs)
M6x20 fixing set (SS 316)	SS 316 (A4)	1027011	0,016
M8x25 fixing set (SS 316)	SS 316 (A4)	1027109	0,036



Bolts (DIN 7985)

Description	Material	Order Code	Weight (kg/pcs)
M6x20 bolt (DIN 7985) (SS 316)	SS 316 (A4)	1027012	0,007
M8x25 bolt (DIN 7985) (SS 316)	SS 316 (A4)	1025647	0,019



Nuts (DIN 934)

Description	Material	Order Code	Weight (kg/pcs)
M6 Hex. Nut (DIN934) (SS 316)	SS 316 (A4)	1027013	0,003
M8 Hex. Nut (DIN 934) (SS 316)	SS 316 (A4)	1025649	0,005

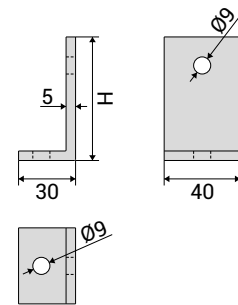
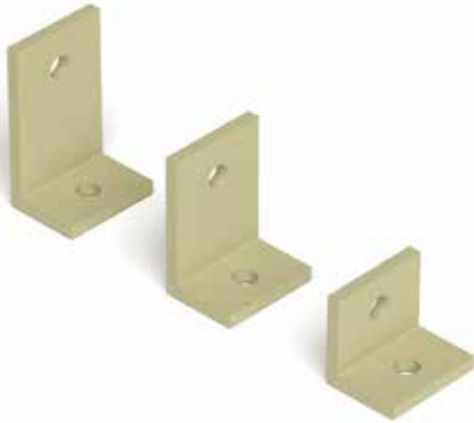


Washers (DIN 9021)

Description	Material	Order Code	Weight (kg/pcs)
M6 plain washer (DIN 9021) (SS 316)	SS 316 (A4)	1027014	0,003
M8 plain washer (DIN 9021) (SS 316)	SS 316 (A4)	1025648	0,006



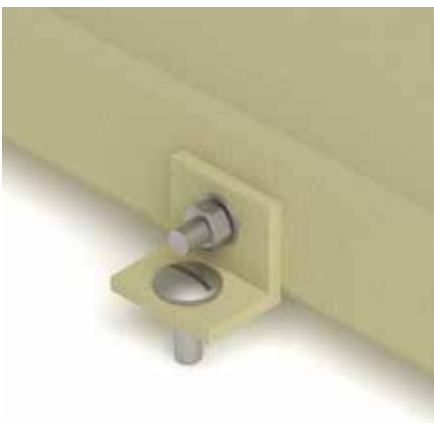
Fasteners (Stainless Steel 316)



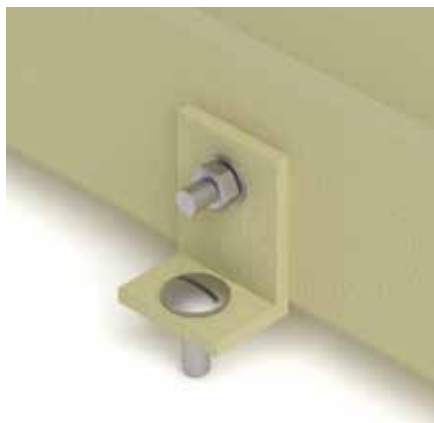
Description	Material	Height (mm)	Order Code	Weight (kg/set)
H50 Fixing Clamp (GRP)	GRP	35	1027015	0,065
H80 Fixing Clamp (GRP)	GRP	55	1027016	0,072
H100 Fixing Clamp (GRP)	GRP	65	1027017	0,080

Assembly

H50



H80

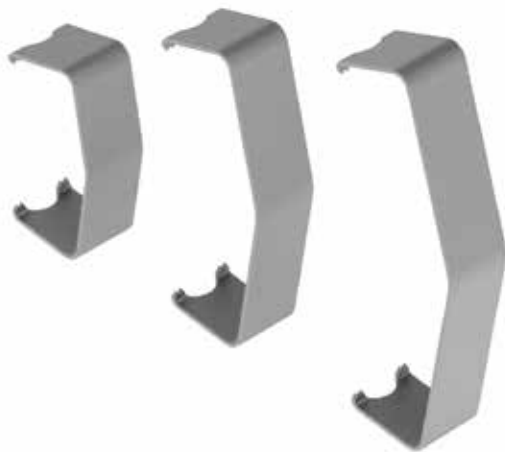


H100

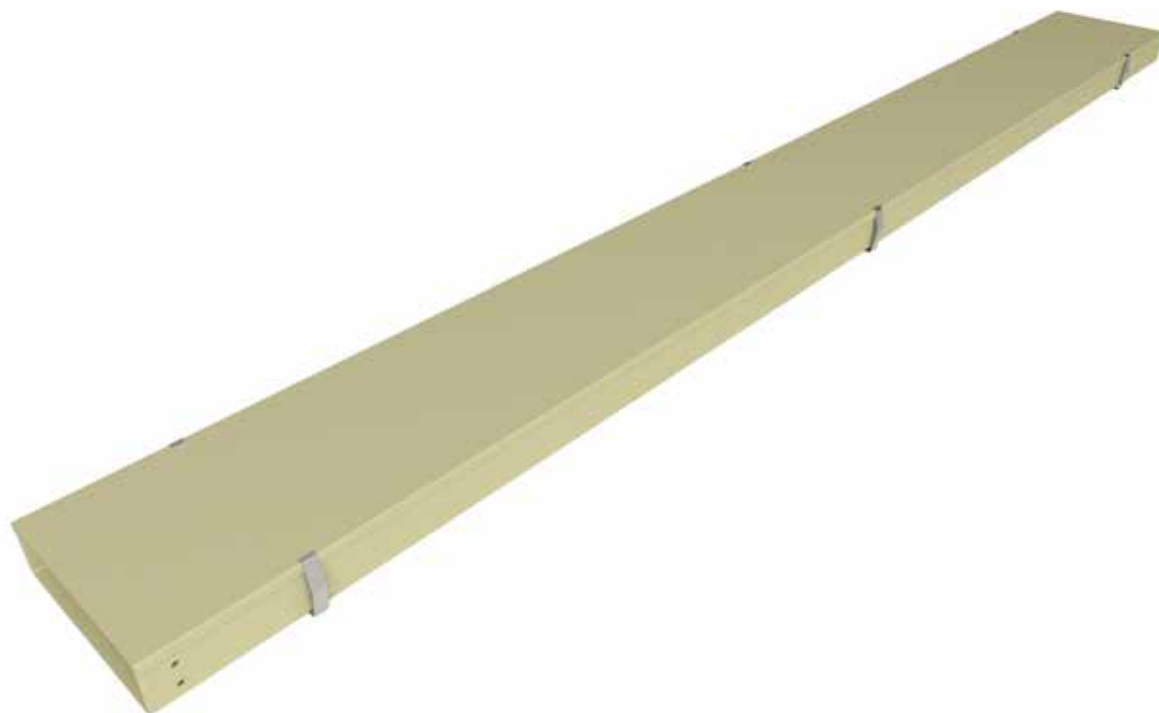


- **Material** : Glass Reinforced Polyester (GRP) (Halogen-free, UV-resistant and UL94-V0) as standard.
- **Color** : Light beige (Pebble Grey, RAL7032) (SS316 grade, upon request.)
- **Fasteners** : 1 set includes
 - 1 pcs fixing clamp
 - 1 pcs M8x25 bolt (for bottom)
 - 1 set M8x25 bolt (for tray)

Standard Cover Clamp (Stainless Steel)

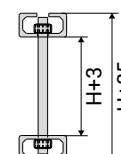
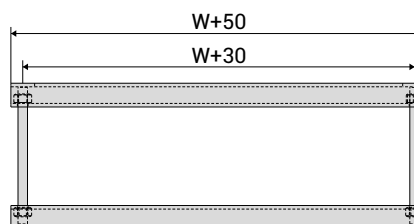


Description	Order Code	Weight (kg/pcs)
50 KCA/CTA GRP Cover Clamp SS	1027009	0,020
80 KCA/CTA GRP Cover Clamp SS	1027010	0,025
100 KCA/CTA GRP Cover Clamp SS	1025642	0,030
150 KCA/CTA GRP Cover Clamp SS	1025643	0,040



• **Material** : Stainless Steel
Recommended for indoor applications

Heavy Duty Cover Clamp



Description	Height (mm)	Width (mm)	Order Code	Weight (kg/set)
50 KCA/CTA GRP 050 Cover Clamp-HD	50	50	3210196	0,25
50 KCA/CTA GRP 100 Cover Clamp-HD	50	100	3210197	0,30
50 KCA/CTA GRP 150 Cover Clamp-HD	50	150	3210198	0,35
50 KCA/CTA GRP 200 Cover Clamp-HD	50	200	3210199	0,40
50 KCA/CTA GRP 250 Cover Clamp-HD	50	250	3210200	0,45
50 KCA/CTA GRP 300 Cover Clamp-HD	50	300	3210201	0,50
50 KCA/CTA GRP 400 Cover Clamp-HD	50	400	3210202	0,60
50 KCA/CTA GRP 450 Cover Clamp-HD	50	450	3210203	0,70
50 KCA/CTA GRP 500 Cover Clamp-HD	50	500	3210204	0,75
50 KCA/CTA GRP 600 Cover Clamp-HD	50	600	3210205	0,85
80 KCA/CTA GRP 100 Cover Clamp-HD	80	100	3210206	0,30
80 KCA/CTA GRP 150 Cover Clamp-HD	80	150	3210207	0,35
80 KCA/CTA GRP 200 Cover Clamp-HD	80	200	3210208	0,40
80 KCA/CTA GRP 250 Cover Clamp-HD	80	250	3210209	0,50
80 KCA/CTA GRP 300 Cover Clamp-HD	80	300	3210210	0,55
80 KCA/CTA GRP 400 Cover Clamp-HD	80	400	3210211	0,65
80 KCA/CTA GRP 450 Cover Clamp-HD	80	450	3210212	0,70
80 KCA/CTA GRP 500 Cover Clamp-HD	80	500	3210213	0,75
80 KCA/CTA GRP 600 Cover Clamp-HD	80	600	3210214	0,85
100 KCA/CTA GRP 100 Cover Clamp-HD	100	100	3210215	0,35
100 KCA/CTA GRP 150 Cover Clamp-HD	100	150	3210216	0,40
100 KCA/CTA GRP 200 Cover Clamp-HD	100	200	3210217	0,45
100 KCA/CTA GRP 250 Cover Clamp-HD	100	250	3210218	0,50
100 KCA/CTA GRP 300 Cover Clamp-HD	100	300	3210219	0,55
100 KCA/CTA GRP 400 Cover Clamp-HD	100	400	3210220	0,70
100 KCA/CTA GRP 450 Cover Clamp-HD	100	450	3210221	0,75
100 KCA/CTA GRP 500 Cover Clamp-HD	100	500	3210222	0,80
100 KCA/CTA GRP 600 Cover Clamp-HD	100	600	3210223	0,90
100 KCA/CTA GRP 750 Cover Clamp-HD	100	500	3210406	1,05
100 KCA/CTA GRP 900 Cover Clamp-HD	100	600	3210407	1,20

- **Material** : Profiles: GRP (2 pcs)
 - Threaded rod: M8, SS316 (2 pcs)
- **Order Detail** : Nut: M8, SS316 (4 pcs)
 - 1 set should be ordered per each 1meter length.

PE

Polyester Resin (ex: seaside, offshore platforms)

Most commonly used resin system. It offers good chemical resistance and weathering properties

- Environment: Strong atmospheric type corrosion (ex: seaside)
- Advantages: Optimal cost, good behaviour to fire
- Our recommendation: Self-extinguishing polyester, 0% halogen

PE-A

Polyester Anti-static Resin (ex: mine, gas groups I)

Anti-static property is given to Polyester resin by adding carbon-powder, which increases the conductivity of the material where grounding is required.

- Environment: Highly exploding atmospheres
- Advantages: Anti-static properties
- Our recommendation: 0% halogen

AC

Acrylic Resin (ex: tunnel)

It is ideal to use in enclosed areas, mass transit and tunnels. This resin has low smoke and toxicity properties while maintains good fire properties.

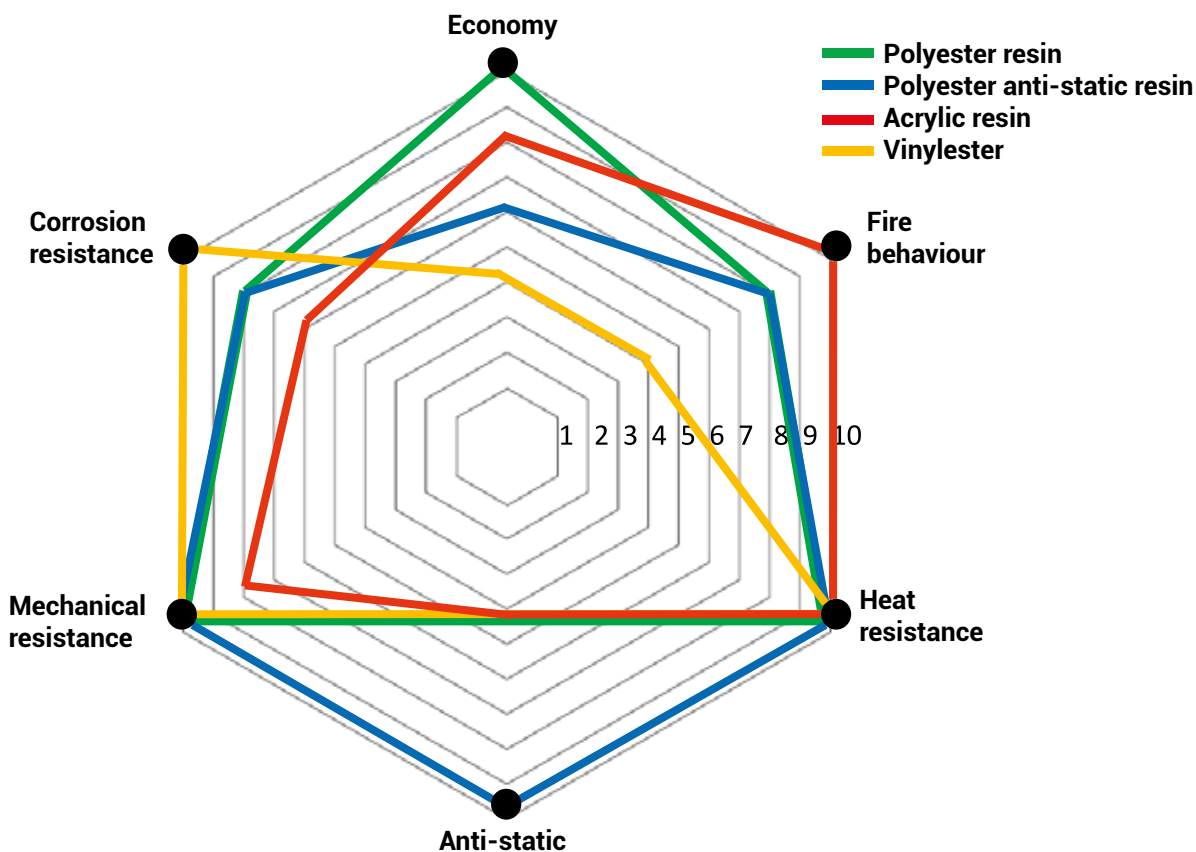
- Environment: Risk of fire in enclosed and corrosive environment (ex: seaside)
- Advantages: Excellent resistance to fire with max. security
- Our recommendation: Self-extinguishing acrylic, 0% halogen

VE

Vinyl Resin (ex: H2SO4, HCl, corrosive chemical agents)

It offers resistance to aggressive chemicals such as H2SO4, HCl etc.

- Environment: Heavy chemical and caustic materials
- Advantages: High chemical corrosion resistance and heat resistance
- Our recommendation: 0% halogen



NON-METALLIC CABLE TRAY

PART1 – SCOPE

This specification covers the minimum requirements for design, manufacture, testing, and supply of Fiberglass Reinforced Plastic (CTA GRP) cable trays, necessary hardware, accessories and fittings etc. suitable for indoor/outdoor installations, required for cable laying.

- CTA GRP cable trays shall be designed and manufactured meeting the requirements of NEMA FG-1 and ASTM E-84.
- All cable trays and accessories shall be corrosion/ chemical resistant, weather resistant, easy to drill and cut, lightweight, high strength and flame retardant (Class 1 Rating) in accordance with ASTM E-84. All the composite materials shall have UV light inhibiting chemical additives to resist degradation from ultra violet light. All composite materials shall have Halogen-free properties.

DESIGN & DEFLECTION

- E-Line CTA GRP Fiberglass reinforced cable tray sections are designed and manufactured to achieve the loading requirements of the IEC 61537, and are available in various load and span performances up to 3 meters span.
- All reported results are based on uniformly distributed static loads, multi-span configuration for IEC 61537 load testing.
- All cable support deflections, within this catalogue, pertain to continuous cable support systems and do not take into consideration simply supported or end bay sections.
- It should be noted that the positioning of splice joints and loading techniques can significantly impact upon the actual deflection. Refer to NEMA VE2 installation guidelines for further information.
- Special consideration should always be given to live loads resulting from cable pulling to ensure this does not exceed the static cable support load limit.
- All load results detailed in this section have been derived from testing 600mm wide sections of CTA GRP/GRP cable ladders in the various configurations.

PART 2 - PRODUCTS

SPECIFICATIONS FOR EAE CABLE TRAY E-LINE CTA GRP Series Cable Tray

1. Cable Tray Design

- 1.1. Cable tray shall be designed and manufactured by EAE ELEKTRİK A.S.
- 1.2. General: They shall be complete with installation and mounting accessories of CTA GRP such as bends, tees, crosses, reducers, splices, tray covers and other necessary hardware, fastener etc. defined in the latest IEC 61537 standard (International standard). Specially designed and manufactured cable tray allows easy installation of cables which shall be free from burrs, projections,
- 1.3. sharp edges inside where cables can be damaged.

2. Manufacture and Dimensions

- 2.1. General. CTA GRP cable trays are manufactured in metric SI units.
- 2.2. Length. Straight lengths shall be manufactured in 3-meters.
- 2.3. Height. Overall heights shall be 50mm, 80mm, and 100mm.
- 2.4. Width. Overall widths shall be 150mm, 200mm, 250mm, 300mm, 400mm, 450mm, 500mm and 600mm.
- 2.5. Thickness. Thickness shall be 3 mm for 50-300mm widths and 4,5mm for 400-600mm widths.
- 2.6. Fittings. Various types of fittings are available for supporting horizontal and vertical directional cable route/size changes:
 - Horizontal fittings: elbows, tee, cross, middle-left-right reducers
 - Vertical fittings: inside vertical elbow, outside vertical elbow, angle adjustable elbow
 - Standard Radius: R300, R450 and R600 (300, 450 and 600mm, respectively)
 - Standard angle for horizontal and vertical elbows: 450 - 900 (Other angles are possible upon request).

3. Material Properties and Finish.

Straight section structural elements; trays straight lengths and splice plates shall be pultruded from glass fiber reinforced polyester resin as standard and, vinyl ester resin upon request.

3.1.Flame Retardant and Non-Toxic Properties

- The material of construction for Cable Trays, Cable Ladders and Fittings must possess self-extinguishing properties to meet the requirements of ASTM D635 & UL 94.
- The Cable Trays, Cable Ladders and Fittings material characteristics must comply with Class 1 flame rating when it is fire tested against BS 476 Part 7.
- The Cable Trays, Cable Ladders and Fittings must possess a flame-spread index of 25 or less when it is tested in accordance with ASTM E84 Standard.
- Cable Trays / Ladders and Fittings shall have an oxygen index of 28 or greater. The testing requirements of oxygen index shall be in accordance with ISO 4589-2.
- For indoor, accommodation modules and air-conditioned area, the complete Cable Trays / Ladders, Fittings and its constituents shall be low smoke zero halogen type in accordance with ISO 5659-2 and IEC 60754-2.

3.2.UV Resistance Properties

The Cable Trays, Cable Ladders and accessories shall be UV resistant and shall meet requirements of ISO 4582 & ISO 4892. An UV inhibitor shall be included in the resin systems to minimize UV degradation.

3.3.Chemical and Water Resistance Properties

- Cable Trays, Cable Ladders and Fittings shall be resistant to a wide range of organic, inorganic substances, Saliferous and H₂S atmosphere.
- All selected materials for construction shall provide enhanced chemical resistance under the minimum, normal and maximum conditions of temperature and corrosive environment.
- Cable Trays / Ladders and its constituent materials shall not exceed 0.7% of weight increase when subjected to water absorption test for twenty four (24) hours in accordance with ASTM D570.

3.4.Anti-Static Properties

- The resin system shall contain a graphite filler or carbon fiber interwoven matting to prevent the accumulation of static electricity. The selection of the material shall be such that surface resistance shall not exceed 10⁹ Ω in accordance with IEC 60079-0, Section 7.4.

3.5.Surface Quality

- All profiles shall be free from surface defects, which may reduce the standard mechanical properties or reduce the operational life of the material.

3.6.Color

- Pultruded shapes shall have RAL 7032 (Pebble grey, light beige) as standard. Other colors are possible upon request.

4.Covers

- 4.1. Covers shall be constructed KCA GRP/GRP Composite with a minimum thickness 3mm.
- 4.2. Covers shall be supplied to protect tray cables where needed.
- 4.3. All range of manufactured straight lengths and fittings shall be supplied with their covers upon request.
- 4.4. Perforated and non-perforated type flat and slope covers can be manufactured.
- 4.5. Heavy duty omega type cover clamps shall be used for outdoor applications.

5.Accessories

- 5.1. Accessories shall be furnished as required to protect, support and install the cable ladder system.
- 5.2. Splice plates, expansion splice plates, horizontal and vertical adjustable couplers, vertical adjustable fitting, dividers, junction box plates as well as fixing fasteners are standard manufactured and supplied accessories by EAE.

6.Splice plates

- 6.1 Splice plates shall be fastened to the outside of the cable ladder side-rails.
- 6.2 Bolts, nuts and washers shall be supplied with splice plates. Stainless Steel 316 as standard.
- 6.3 Straight and expansion splice plates will be of "L" shaped lay-in design with a four-bolt or eight-bolt pattern.

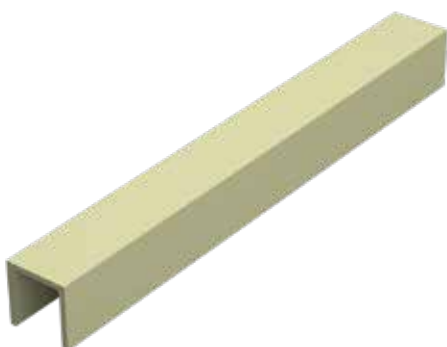
ELINEGRPA-A

►► Support System

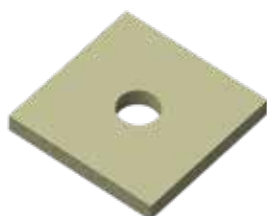
Description	Order Code	Weight (kg/m)
43x43x 4mm GRP BINRAK	3234649	1,00



Description	Order Code	Weight (kg/m)
55x55 x 5mm GRP U-Profile	3234650	1,35

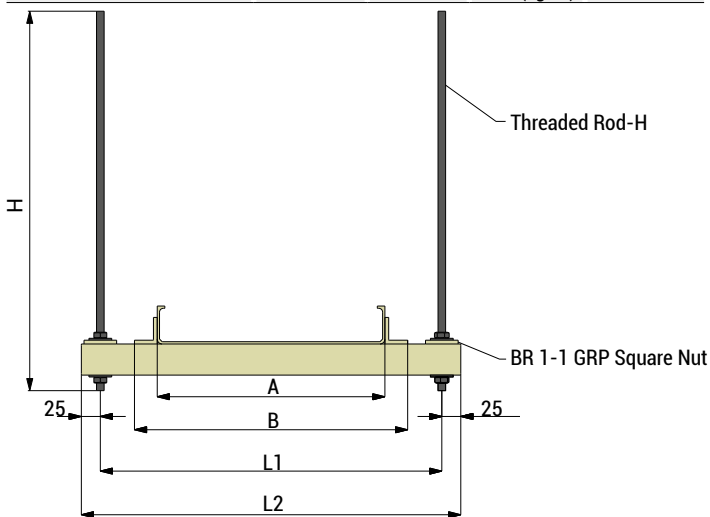


Description	T (mm)	Order Code	Weight (kg/pcs)
BR 1-1 GRP Square nut	5mm	3234651	0,015



Ceiling Support – Threaded Rod

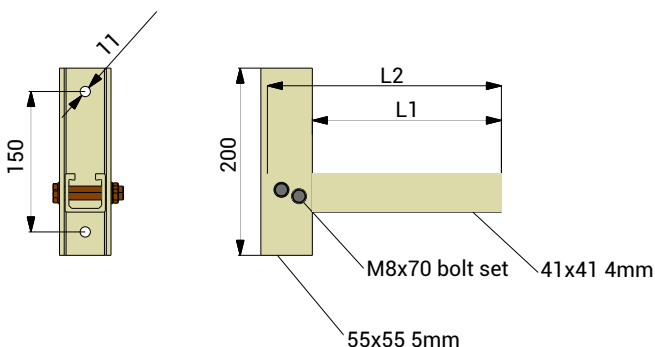
Description	Size	Material	Weight (kg/pcs.)	Code
Threaded Rod	M8x500	SS316	0,20	5000832
	M8x1000	SS316	0,40	5000833
	M8x1500	SS316	0,60	5000834
	M8x2000	SS316	0,80	5000835
	M8x3000	SS316	1,20	5000836
	M10x500	SS316	0,32	5000838
	M10x1000	SS316	0,64	5000839
	M10x1500	SS316	0,96	5000840
	M10x2000	SS316	1,28	5000841
	M10x3000	SS316	1,92	5000842
Nut	M8	SS316	0,005	1025649
	M10	SS316	0,012	1011109
Flas Washer	M8	SS316	0,006	1025648
	M10	SS316	0,013	1027285
BR 1-1 GRP Square Nut		GRP	0,015	3234651
43x43x 4mm GRP Binrak		GRP	1,00 (kg/m)	3234649



TRAY WIDTH				
A	B	L1	L2	H
mm	mm	mm	mm	mm
50	110	200	250	H
100	160	250	300	H
150	210	300	350	H
200	260	350	400	H
250	310	400	450	H
300	360	450	500	H
400	460	550	600	H
450	510	600	650	H
500	560	650	700	H
600	660	750	800	H

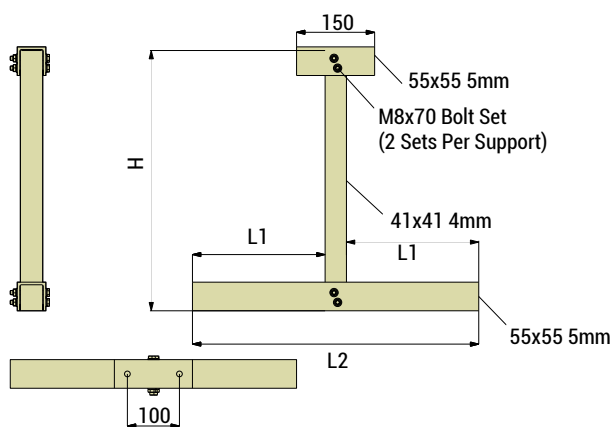
Cantilever Arm – Without Bracing

Description	L1	L2	SWL	Weight	Code
	mm	mm	kg	kg/set	
Cantilever Arm-050	100	150	125	0,50	3234658
Cantilever Arm-100	150	200	125	0,55	3234659
Cantilever Arm-150	200	250	125	0,60	3234660
Cantilever Arm-200	250	300	125	0,65	3234661
Cantilever Arm-250	300	350	125	0,70	3234662
Cantilever Arm-300	350	400	125	0,75	3234663



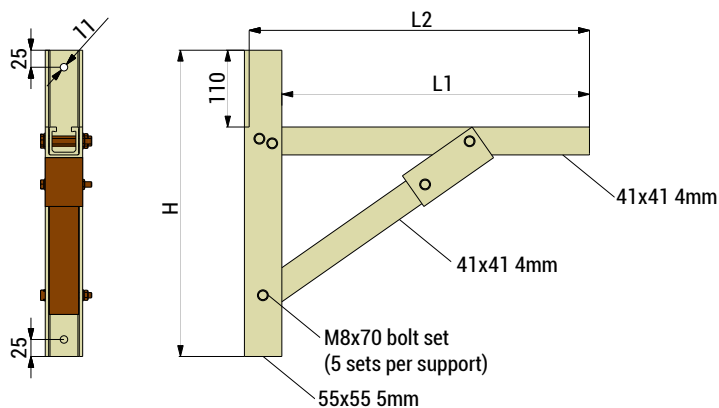
Ceiling Support – T Type

Description	L1	L2	H	SWL	Weight	Code
	mm	mm	mm	kg	kg/set	
Ceiling Support-050	100	250	500	125	1,25	3234652
Ceiling Support-100	150	350	500	125	1,40	3234653
Ceiling Support-150	200	450	500	125	1,55	3234654
Ceiling Support-200	250	550	500	125	1,70	3234655
Ceiling Support-250	300	650	500	125	1,80	3234656
Ceiling Support-300	350	750	500	125	1,95	3234657



Cantilever Support – With Angle Bracing

Description	L1	L2	H	SWL	Weight	Code
	mm	mm	mm	kg	kg/set	
Cantilever Arm-100	150	200	350	125	1,25	3234664
Cantilever Arm-150	200	250	350	125	1,35	3234665
Cantilever Arm-200	250	300	350	125	1,40	3234666
Cantilever Arm-250	300	350	400	125	1,55	3234667
Cantilever Arm-300	350	400	400	125	1,70	3234668
Cantilever Arm-400	450	500	450	125	1,90	3234669
Cantilever Arm-450	500	550	500	125	2,10	3234670
Cantilever Arm-500	550	600	550	125	2,30	3234671
Cantilever Arm-600	650	700	550	125	2,50	3234672



	Component List			
Item No	Component	Quantity	Company :	Prepared by
			Project :	
			Project No:	Name :
				Date :
				Signature :

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PRODUCT TYPES



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