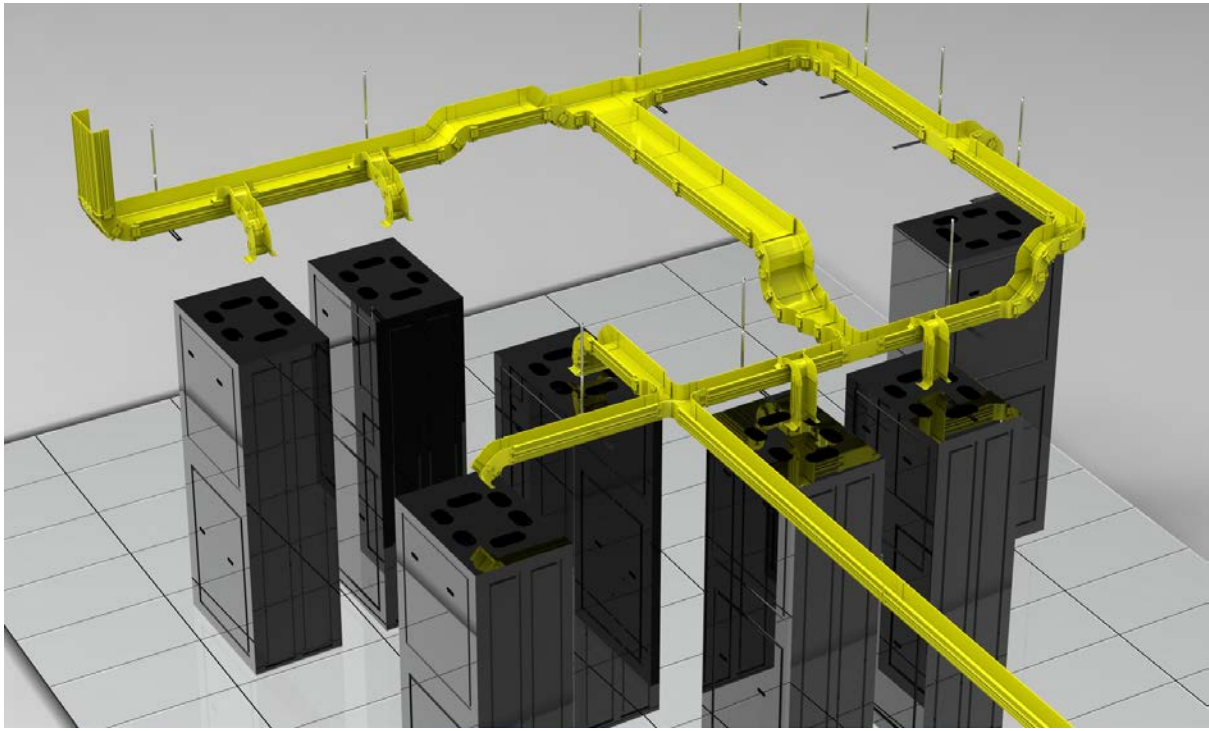


DONG WOO TECH

Fiber Cable Ducting Solution



DongWoo Tech

1. Optical Cable Duct System.

1.1 Introduction.

DONGWOO Cable Duct Raceway System is designed to protect and cover fiber optical cable and patch cord safely using in data center building or optical termination equipment.

DONGWOO Cable Duct is made from PC/ABS with halogen free, heat stability & resistance, weather resistance, dimensional stability and flame as well as UL 2024 certified. Also our products have been tested impact resistance and tensile strength.

You can install DONGWOO Duct easily and fast without special equipment. So these advantage will make you save time and cost.

When you need to extend your server rack, our 'Vertical or Horizontal Drop' part is able to be good way to build on existing Duct through just hanging on without additional work.

1.2 Features and Benefits.

1.2.1 *Easy and quick installation*

DONGWOO Cable Duct system is using Snap-Fit way. It will provide you not only simple, easy and fast installation but also various layout.

1.2.2 *Require no special tool*

If you have only screw driver, you can connect and install all DONGWOO Cable Duct without any special equipment. Our Snap-Fit system makes it possible..

1.2.3 *Halogen Free Raw Materials, PC/ABS*

We are using composite material combined Polycarbonate and ABS resin that is having high durability with flexible.

1.2.4 Flexible and Easy Extension

When you extend server rack and need path for cable from Main Duct to added rack, DONGWOO Horizontal or Vertical Drop will be great way for that. It is able to be installed simply by just only hanging on .

1.2.5 Compatibility with other brand

DONGWOO Cable Duct is designed considering that it can be compatible with other brand products installed already. You can combine it after some cutting process.

2. Why PC/ABS?

2.1 Material Overview

PC/ABS is compound material of Polycarbonate and ABS resin. It has all advantage of both of Polycarbonate and ABS resin with high durability, high moldability, plating, heat resistance and so on.

Moreover, this material meets the heat stability, weather resistance, and flame retardant promote the plastic's usefulness as a material in automobiles, electric and electronic goods.

2.1.1 PC/ABS Material Features

1) High Moldability

PC/ABS is 1.5~2 times more flexible than Polycarbonate. So it is good to be formed and machined. This advantage bring minimized distortion and no cracking when it is formed..

2) High Durability

PC/ABS provides excellent impact strength in comparison with other engineering plastics. This impact stabilized resistance leads to its application in structural materials and other exterior parts. PC/ABS is available in a wide temperature range showing remarkable mechanical strength compared to other engineering plastics. This property is suitable when cold or heat resistance is required in products.

3) *Chemical Resistance*

PC/ABS, in general, is stable in alcohol, water, oil, and salts.

4) *Dimensional Stability*

PC/ABS show good dimensional stability by its minute shrinkage changes whether perpendicular or parallel to the flow direction.

2.1.2 Material Properties

1) *Remarkable Heat Stability*

Non-halogen, flame retardant PC/ABS has an extremely reliable heat stability allowing the flexible design of the molding conditions such as the type of hot runner and pin point gate, and other.

2) *Various Flame Retardant PC/ABS against Environmental Problems*

Flame retardants that could produce toxic materials(Dioxin, Difuran) during combustion are not used at the material. Flame retardant grade(UL certificate achieved) V0 in accordance with UL94..

3) *Weather Resistance*

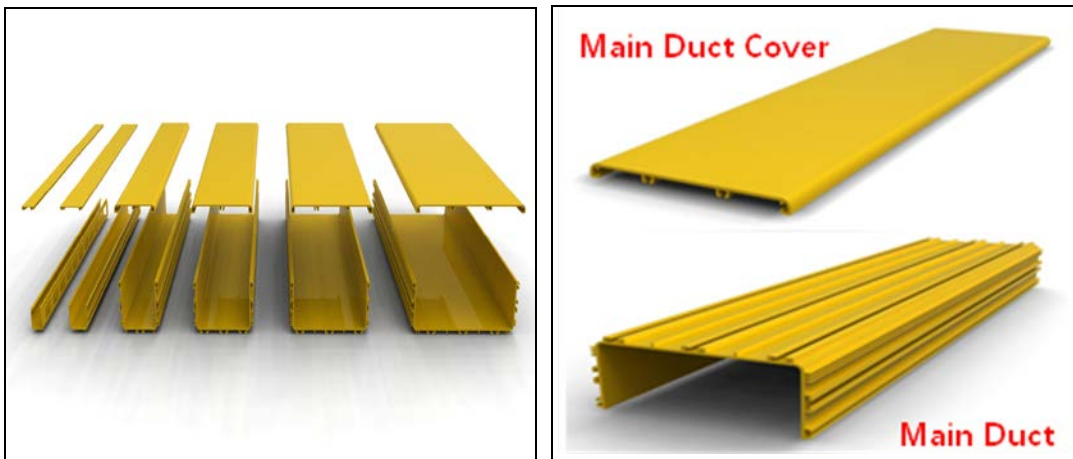
General grade PC/ABS shows little change in mechanical strength and discoloring when exposed to light due to its good weather resistance.

3. Specification.

3.1 Main Duct

The Main Duct comes complete with a full-length extruded body and is made of PC/ABS material with a non-halogen fire retardant.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit
- Unit length is 1 meter (2 meter is available)



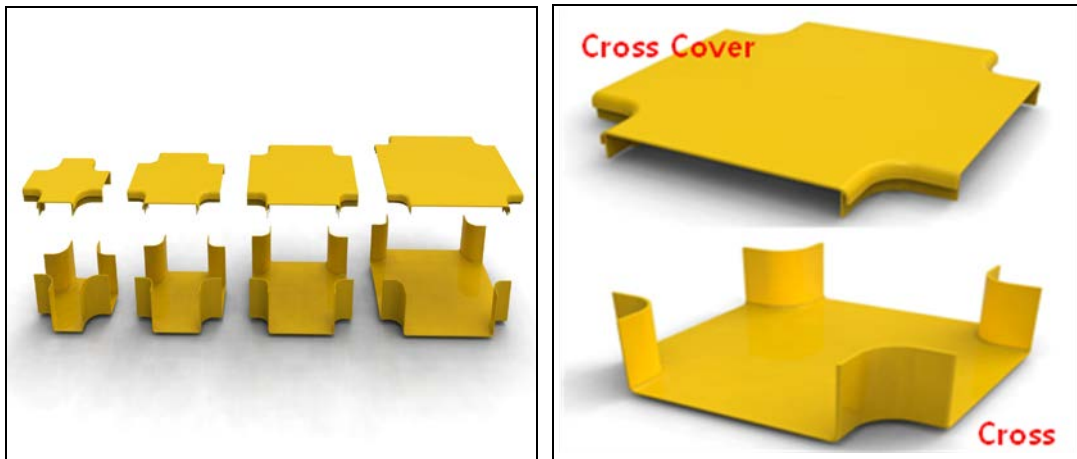
Product	Product Code	Size (W x H)	Item Code	Cable Capacity (3mm Dia)	ReMark
Main Duct & Main Duct Cover	MD & MDC	50 x 50	DW-05MD DW-05MDC	150 pigtailed or path cords	With Cover
		100 x 100	DW-10MD DW-10MDC	500 pigtailed or path cords	
		160 x 100	DW-16MD DW-16MDC	750 pigtailed or path cords	
		220 x 100	DW-22MD DW-22MDC	1100 pigtailed or path cords	
		300 x 100	DW-30MD DW-30MDC	1650 pigtailed or path cords	

3.2 Cross and Reduction Cross

The Cross is used to establish a right-angled intersction between Main Ducts and all 4 arms of the cross are connected to Main Duct or other components via Joiner.

The Reduction Cross is used to establish for different size Main Ducts and other components. Each 2 arms is designed with different size to enhance the cabling efficiency.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit



Product	Product Code	Size of Way(W x H)	Item Code	ReMark
Cross & Cross Cover	CA & CAC	100 x 100	DW-10CA DW-10CAC	With Cover
		160 x 100	DW-16CA DW-16CAC	
		220 x 100	DW-22CA DW-22CAC	
		300 x 100	DW-30CA DW-30CAC	

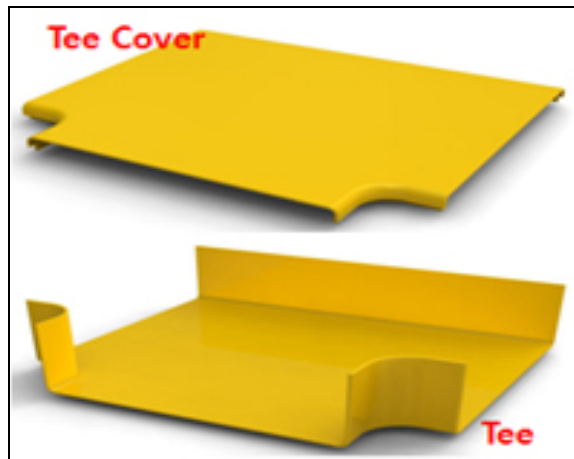
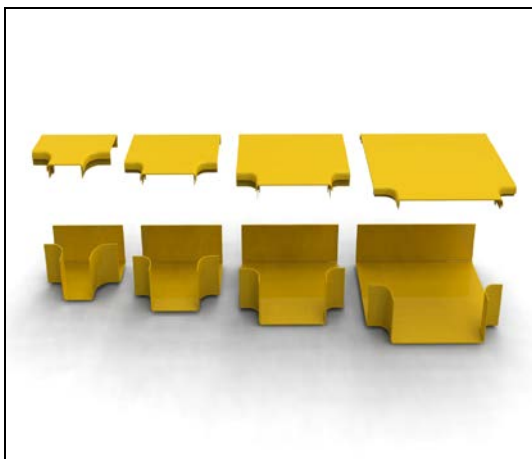
3.3

Tee and Reduction Tee

The Tee is used to provided a tee intersection with standard straigth ducting and requires a standard joiner at each interface, which provides a smooth & strong joint.

The Reduction Tee is used to establish for different size Main Ducts and other components and requires a standard joiner at each interface, which provides a smooth & strong joint.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Easy and Simple design to assemble other components
- Standard Color is Yellow
- Purchase by the unit

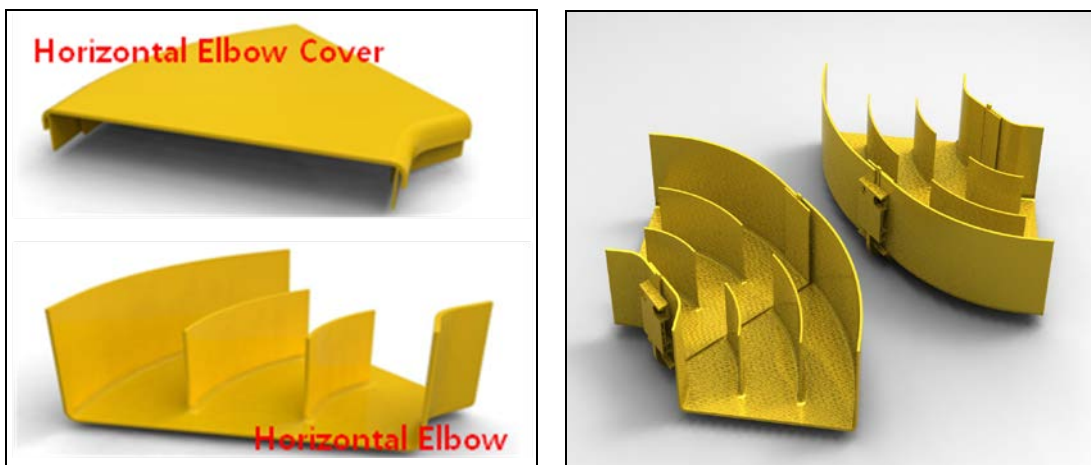


Product	Product Code	Size of Way(W x H)	Item Code	ReMark
TEE & TEE Cover	TA & TAC	100 x 100	DW-10TA DW-10TAC	With Cover
		160 x 100	DW-16TA DW-16TAC	
		220 x 100	DW-22TA DW-22TAC	
		300 x 100	DW-30TA DW-30TAC	

3.4 Horizontal Elbow 45Deg or 90Deg

*The Horizontal Elbow 45Deg provides a method of diverting the duct system into around objects. It can be used with **additional 45 degree elbow to feed a duct at 90 degree by using Joiner***

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

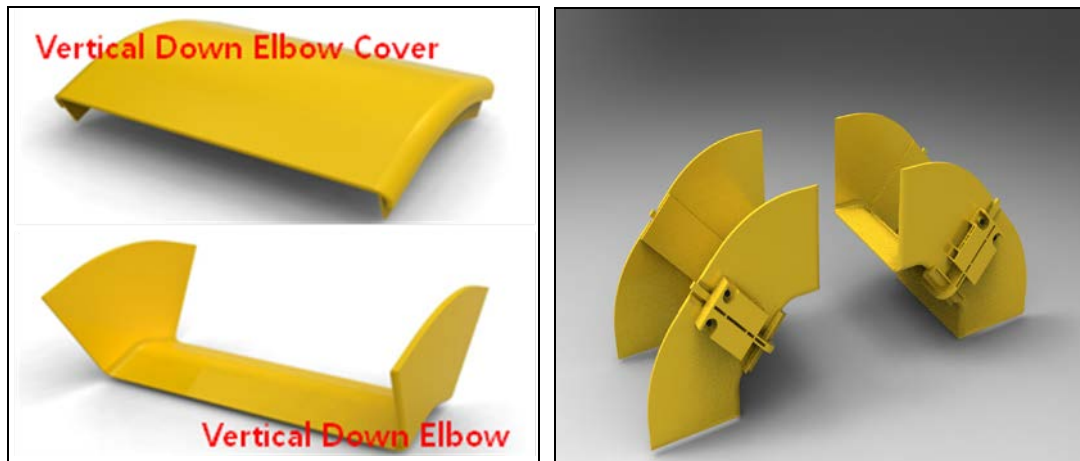


Product	Product Code	Size of Way(W x H)	Item Code	ReMark
Horizontal Elbow & Cover	HA & HAC	100 x 100	DW-10HA45 DW-10HA90 DW-10HAC45 DW-10HAC90	With Cover
		160 x 100	DW-16HA45 DW-16HA90 DW-16HAC45 DW-16HAC90	
		220 x 100	DW-22HA45 DW-22HA90 DW-22HAC45 DW-22HAC90	
		300 x 100	DW-30HA45 DW-30HA90 DW-30HAC45 DW-30HAC90	

3.5 Vertical Elbow 45Deg Down

The Vertical Elbow 45Deg Down is a vertical drop off so that cables within the elbow are easily accessed. It is usually installed where cables are to be dropped off below. Joining two 45 degree down elbow with joiner is substituted for 90 degree down elbow.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

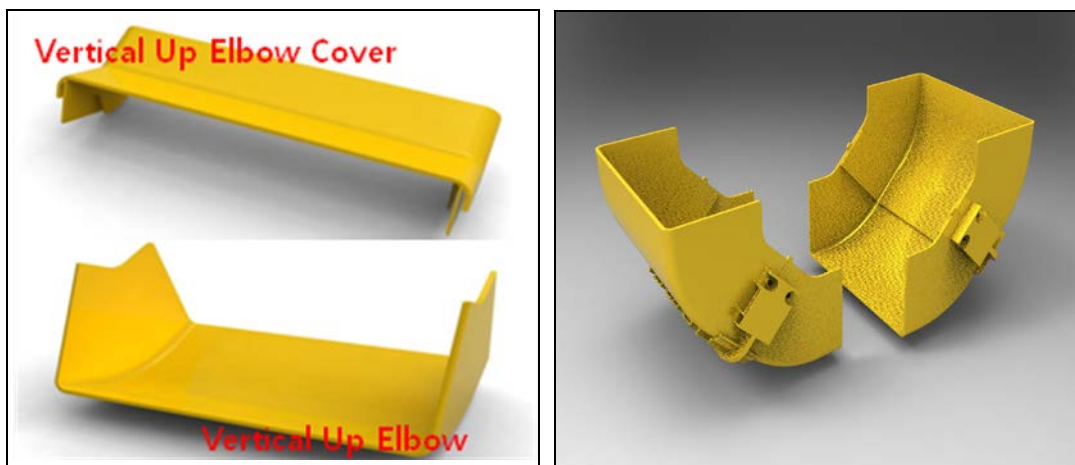


Product	Product Code	Size of Way(W x H)	Item Code	ReMark
Vertical Down Elbow & Cover	DA & DAC	100 x 100	DW-10DA45 DW-10DA90 DW-10DAC45 DW-10DAC90	With Cover
		160 x 100	DW-16DA45 DW-16DA90 DW-16DAC45 DW-16DAC90	
		220 x 100	DW-22DA45 DW-22DA90 DW-22DAC45 DW-22DAC90	
		300 x 100	DW-30DA45 DW-30DA90 DW-30DAC45 DW-30DAC90	

3.6 Vertical Elbow 45Deg Up

The Vertical Elbow 45Deg Up is a vertical lead off so that cables within the elbow are easily accessed. It is usually used where cables are to be installed vertically. Joining two 45 degree up elbow with joiner is substituted for 90 degree up elbow.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

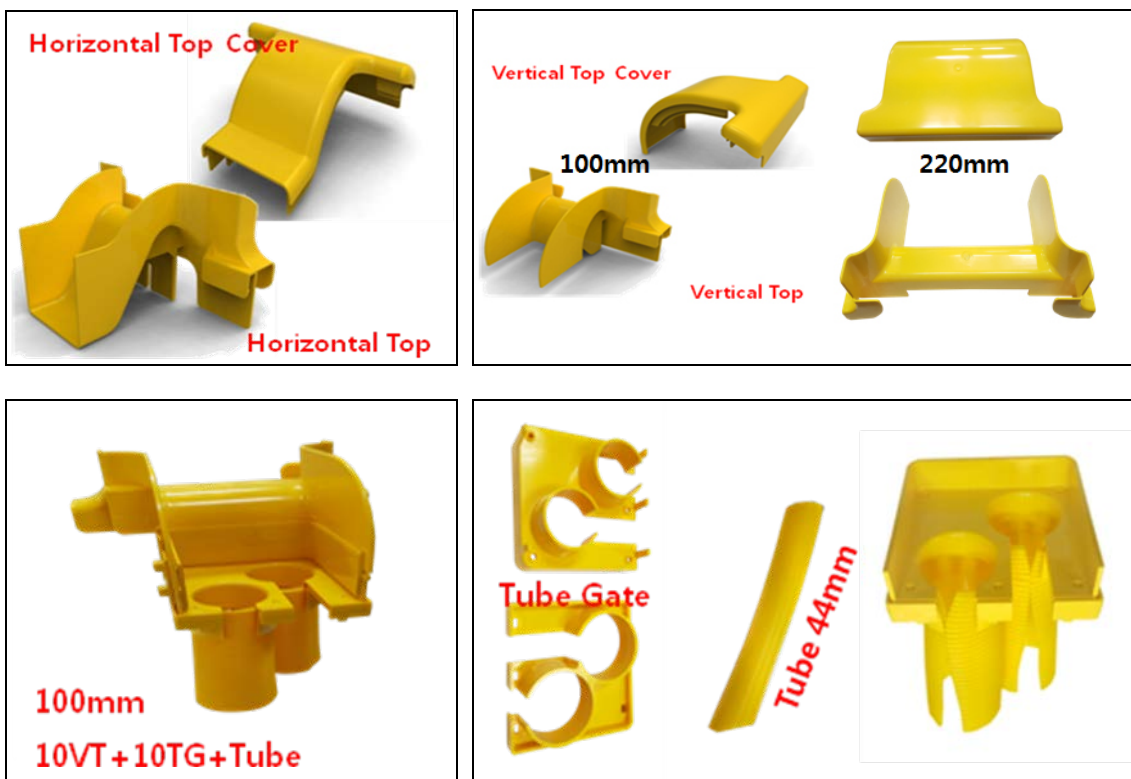


Product	Product Code	Size of Way(W x H)	Item Code	ReMark
Vertical Up Elbow & Cover	UA & UAC	100 x 100	DW-10UA45 DW-10UA90 DW-10UAC45 DW-10UAC90	With Cover
		160 x 100	DW-16UA45 DW-16UA90 DW-16UAC45 DW-16UAC90	
		220 x 100	DW-22UA45 DW-22UA90 DW-22UAC45 DW-22UAC90	
		300 x 100	DW-30UA45 DW-30UA90 DW-30UAC45 DW-30UAC90	

3.7 Top Outlet Drop (Horizontal or Vertical)

The Top Outlet Drop is one of drop off assembly parts is used to provide a safe exit for fiber cables to equipment above or below ducting by connecting with Reducer, Up or Down Elbow, Trumpet and so on.

- Just put the drop into outside wall of duct for assembling.
- No need any tools for assembling and it makes easy installing.
- The drop can be installed wherever you need to put.
- No Joiner to the Main Duct interface.
- Purchase by the unit

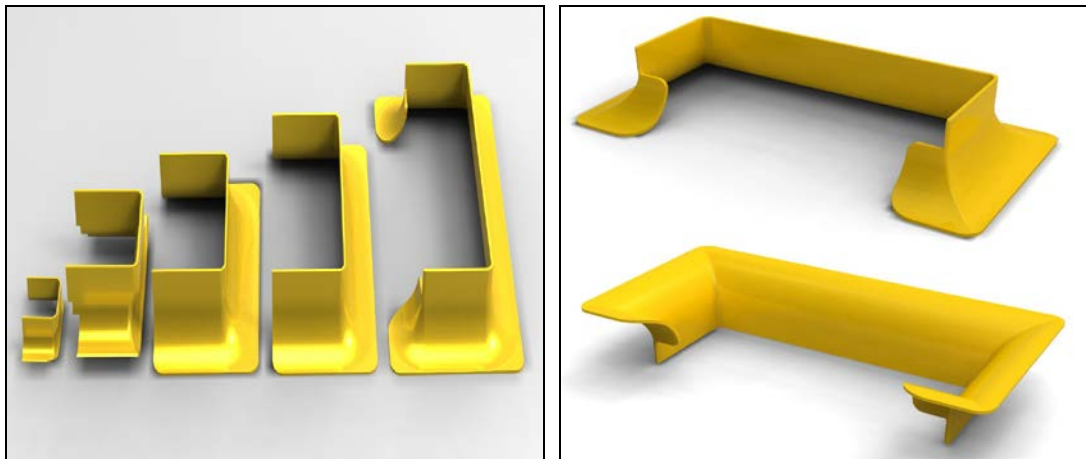


Product	Product Code	Size of Way(W x H)	Item Code	ReMark
Horizontal Top	HT&HTC	100 x 100	DW-10HT&HTC	With Cover
Vertical Top	VT&VTC	100 x 100 220 x 100	DW-10VT&VTC DW-22VT&VTC	
Tube Gate	TG	100 x 100	DW-10TG	
V-Top		∅ 44mm * 1 M	DW-Tube	

3.8 Outlet Trumpet

The Outlet Trumpet is the end part of drop off assembly and is shaped with round type to protect the cord's sheath.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

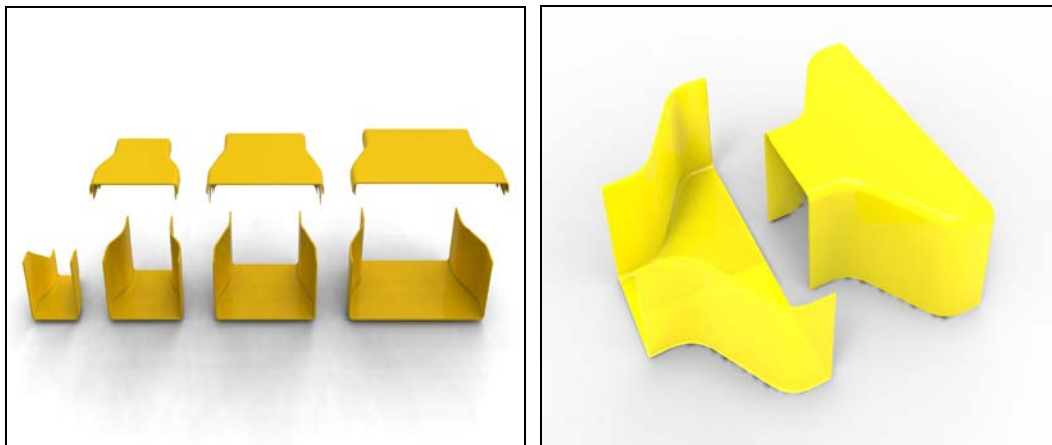


<i>Product</i>	<i>Product Code</i>	<i>Size of Way(W x H)</i>	<i>Item Code</i>	<i>ReMark</i>
Outlet Trumpet	TP	50 x 50	DW-05TP	
		100 x 100	DW-10TP	
		160 x 100	DW-16TP	
		220 x 100	DW-22TP	
		300 x 100	DW-30TP	

3.9 Reducer

The Reducer is used to provide an interface between different size straight ducting and components and requires a joiner at both end face to produce smooth & strong joints.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

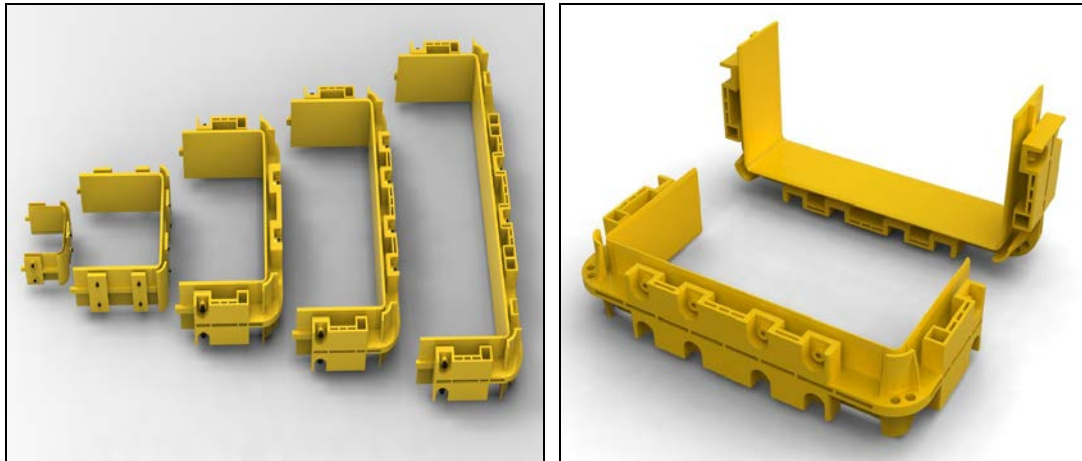


Product	Product Code	Size of Way(W x H)	Item Code	ReMark
Reducer & Cover	RD & RDC	100 x 100 ▶ 50 x 50	DW-10RD	With Cover
		160 x 100 ▶ 100 x 100	DW-16RD DW-16RDC	
		220 x 100 ▶ 160 x 100	DW-22RD DW-22RDC	
		300 x 100 ▶ 220 x 100	DW-30RD DW-30RDC	
		300 x 100 ▶ 100 x 100	DW-3010RD DW-3010RDC	

3.10 Joiner

The Joiner is used to connect standard straight ducting with itself or any of the other components, with which it provides a smooth and strong joint. Typical other fittings are horizontal or vertical elbow, cross connectors, tees, etc, which require a standard joiner at each interface.

- Easy to put cover on duct
- Connecting with other part with joiner
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

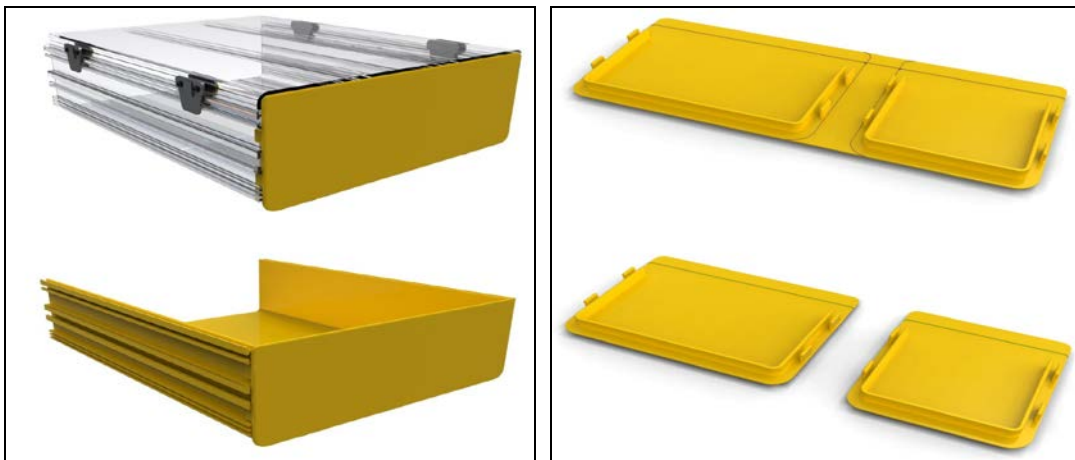


<i>Product</i>	<i>Product Code</i>	<i>Size of Way(W x H)</i>	<i>Item Code</i>	<i>ReMark</i>
Joiner	JO	50 x 50	DW-05JO	With Screw
		100 x 100	DW-10JO	
		160 x 100	DW-16JO	
		220 x 100	DW-22JO	
		300 x 100	DW-30JO	

3.11 End Cap

The End Cap is used for sealing the open end of Main Duct. It put simply into the duct without joiner and fasten bolt.

- No need any tools for assembling and disassembling
- Fire retardant material : PC/ABS
- Standard Color is Yellow
- Purchase by the unit

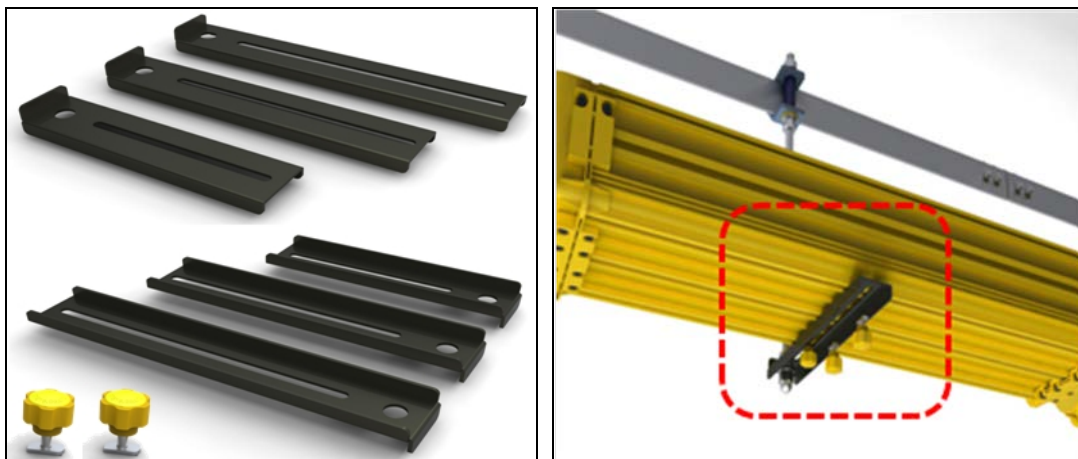


<i>Product</i>	<i>Product Code</i>	<i>Size of Way(W x H)</i>	<i>Item Code</i>	<i>ReMark</i>
End Cap	EC	100 x 100	DW-10EC	
		160 x 100	DW-16EC	
		220 x 100	DW-22EC	
		300 x 100	DW-30EC	

3.12 Side Mounting T/Bolt Bracket

The Mounting Bracket is used to install and secure duct in a straight run. The duct is laid on the Side Mounting Bracket directly without extra bracket. The Side Mounting Bracket is secured, at the desired height, to UNC threaded rod with using UNC hex, nuts and washer.

- Make a rigid and secure installation
- Simple and quick installation
- No need extra mount bracket for fixing the side bracket and duct
- Purchase by the unit

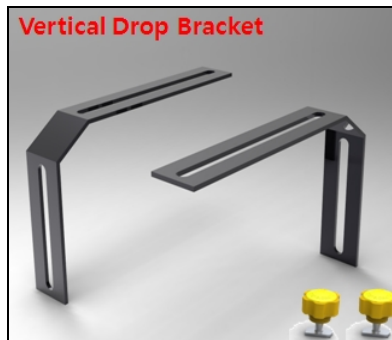
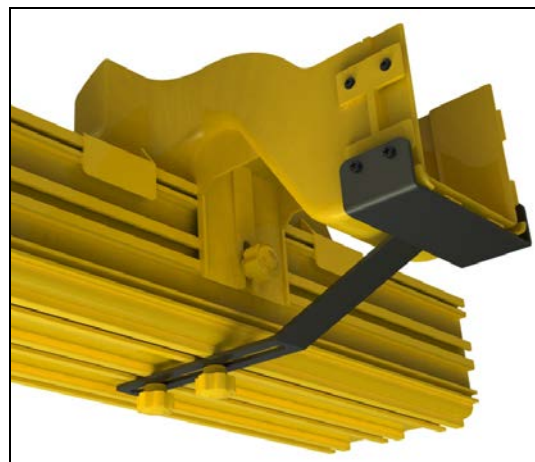


<i>Product</i>	<i>Product Code</i>	<i>Size of Main Duct (W x H)</i>	<i>Item Code</i>	<i>ReMark</i>
Side Mounting T/Bolt Bracket	SMTB	100 x 100 Or 160 x 100	DW-MBK100/160	
		220 x 100	DW-MBK220	
		300 x 100	DW-MBK300	

3.13 Side Mounting T/Bolt Bracket

The Side Mounting Bracket is used to install and support Drop parts.

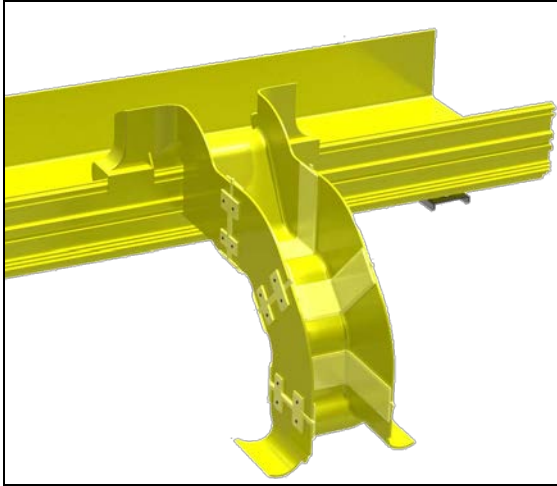
- Make a rigid and secure installation
- Simple and quick installation
- Has flexibility in height adjustment and positioning of Duct.
- Purchase by the unit



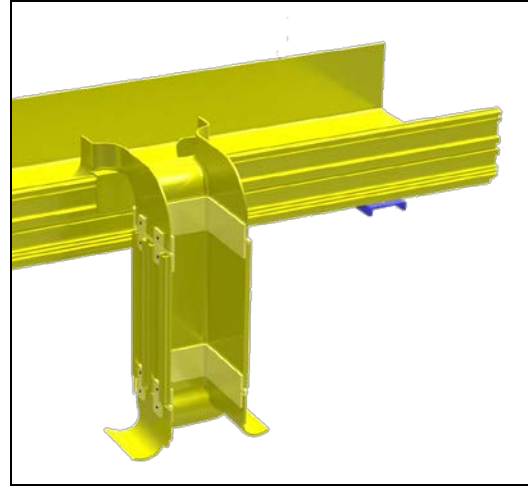
Product	Product Code	Size of Main Duct (W x H)	Item Code	ReMark
Drop Mounting T/Bolt Bracket	DMTB	100 x 100	DW-DMTB100	Horizontal
			DW-DMTB100	Vertical

APPENDIX 1

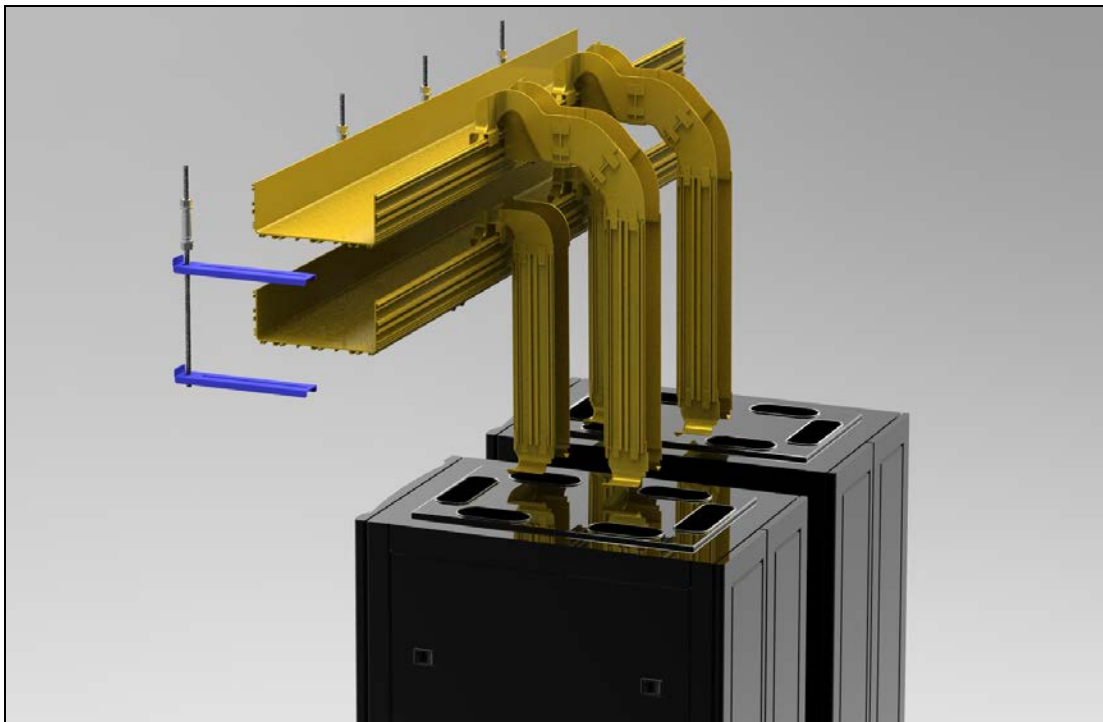
<Horizontal Top Outlet Drop>



<Vertical Top Outlet Drop>



<Example : Horizontal Top & Vertical Top>



Fiber Cable Ducting Systems

APPENDIX 2 – Reference Picture



APPENDIX 3 – Fiber Cable Ducting System Picture

