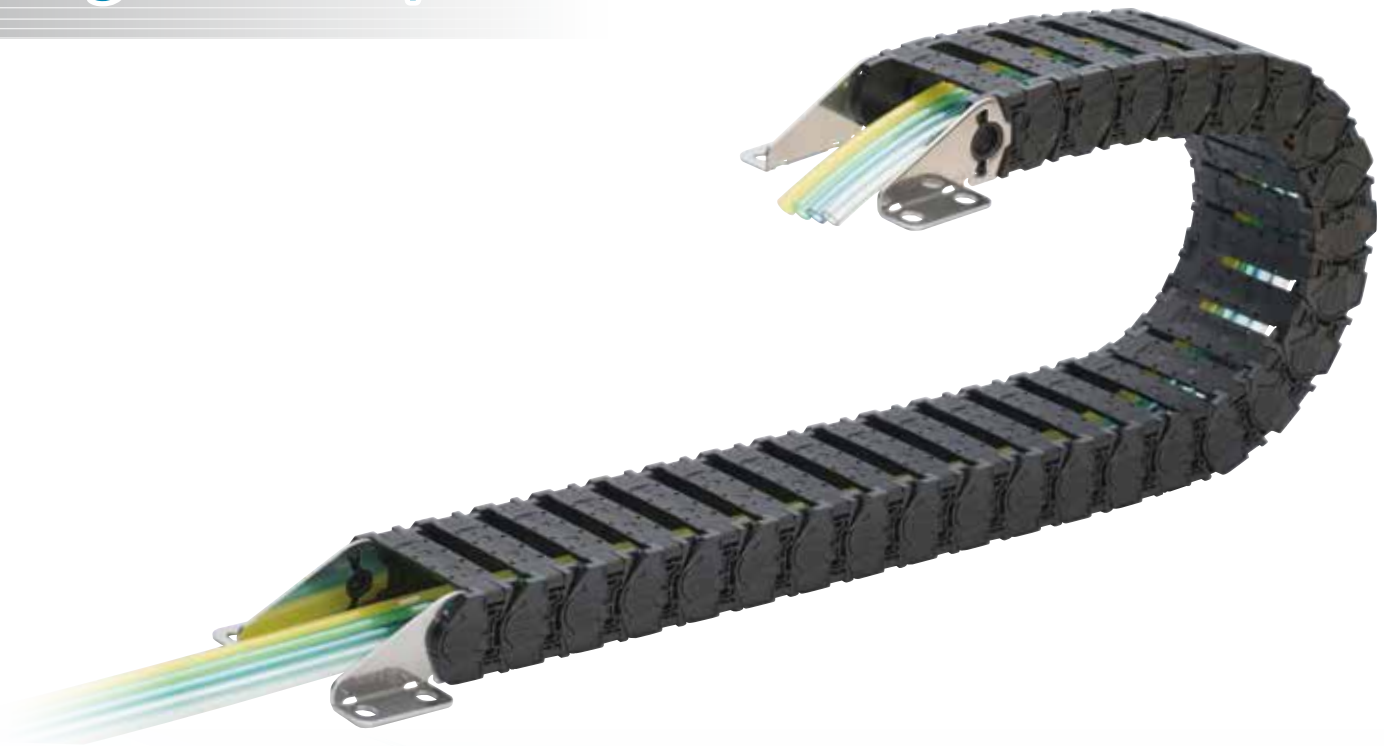


For protection and guiding of cables and tubes

Plarailchain SD

High-spec type sturdy and durable enough for

High travel speed applications



Stable and durable with decentralized load.
Usable for X-Y compound traveling.

Wear-resistant material.
Drastic reduction in wear amount.

Openable and closable anywhere.
Extremely easy to handle.

Open-close
flap applicable
on both inner
and outer
peripheries

Low
Abrasion

High
Durability

Characteristics

Durable

Decentralized load with reinforced structure of the connecting part

- ▶ Increasing the contact area of the joints **reduces rattling and misalignment.**
- ▶ Moment load is decentralized and absorbed, thus usable for **X-Y compound traveling.**

Dual connection structure supported by both inner and outer rings.

Increased resistance to sagging

- ▶ Stopper area of the side plate is increased by 25% compared to the conventional product.

*Comparison with our Plarailchain SP.



Side Plate

Reduced change in motion

- ▶ **Smooth operation** is achieved by shortening the pitch length between links.
- ▶ **Longer lifetime** is achieved by **minimizing the bounce-up motion** during operation and stoppage.

Brackets made of SUS

- ▶ Brackets made of stainless steel (SUS430) firmly support high-speed, high-load operation.



Wear Resistance

Adoption of wear-resistant resin

- ▶ Compared with conventional products, **the friction factor and specific wear are drastically reduced to 1/2 and 1/26 respectively.** Comparison with our Plarailchain SP.

Elimination of all contact surfaces of contents

- ▶ Reduced uneven shapes **reduce the amount of wear caused by contact with the inner wall surfaces of cables, tubes, etc.**

Easy Installation

Effortless insertion and removal of contents

- ▶ The flap can be detached and opened/closed **anywhere on the inner or outer peripheral, on either side.**

Easy to handle regardless of mounting condition !



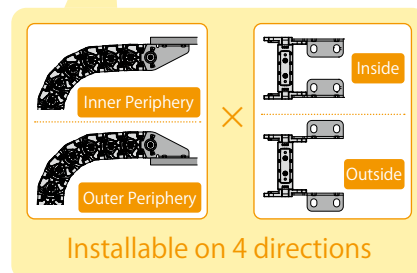
Elimination of troublesome installation directions

- ▶ **Only one type of bracket** is required for each of the moving/fixed end.

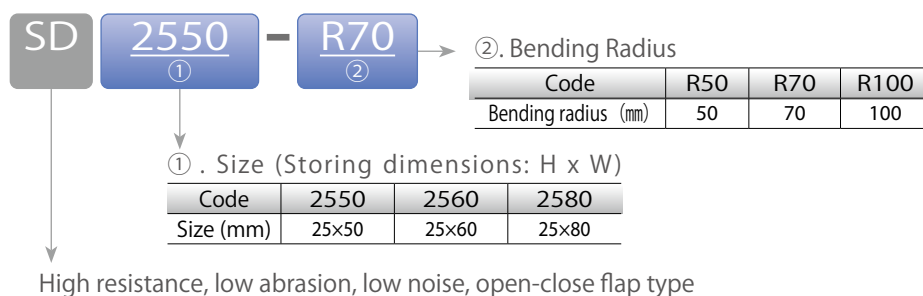
Flame Retardant

UL94 V-0 equivalent

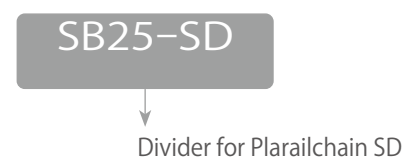
- ▶ UL94 V-0... is a rating of the flammability standard set by a private testing laboratory in the United States (founded by U.S. fire underwriters). Self-extinguishing materials are classified into V-0, V-1, V-2, or HB. V-0 is the toughest rating to achieve in the UL94's V classifications.



Model Designation (Example)



Divider Model Code



Bracket Model code

■ Moving-end and fixed-end must be ordered separately.

*) Brackets have a product name engraved. Engraved -M1, -M2, -F1, -F2 after the name is irrelevant to the model codes.

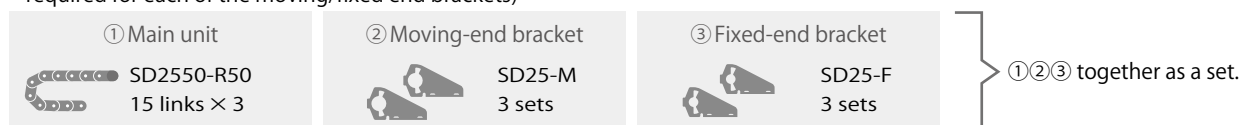
Application	For moving-end				For fixed-end			
Type and material								
Screwing position	Inside		Outside		Inside		Outside	
Orientation	Outside	Inside	Outside	Inside	Outside	Inside	Outside	Inside
Type	Model code				Model Code			
	SD2550				SD2550			
	SD2560				SD2560			
	SD2580				SD2580			
	SD25-M				SD25-F			
	45.7				47.8			
	Weight (g)				Weight (g)			

*1 Two types of brackets are required, each for a fixed and a movable end.

*2 The above weights are the combined weights of left and right brackets as a set.

Order Example

- Ordering SD2550-R50 for 3 sets of 15 links (Regardless of orientation, only one type of bracket is required for each of the moving/fixed end brackets)

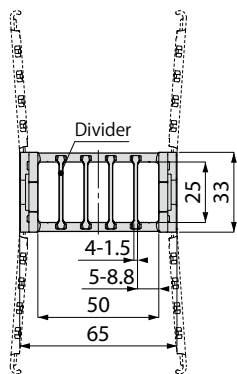


Specifications

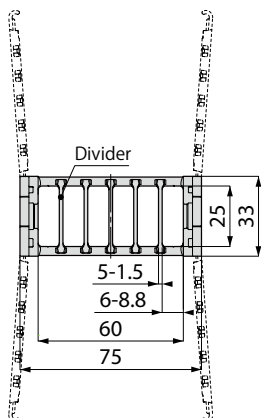
Series		2550	2560	2580
Min. bending radius R	(mm)		50 / 70 / 100	
Max. O.D. of cable/hose	(mm)		ø20	
Pitch length	(mm)		25	
No. of links	(/m)		40	
Max. free span (*)	(m)		2.2	
Max. transfer stroke	(m)		4.3	
Max. contents weight	(kg/m)		7	
Max. transfer speed	(m/s)		4	
Plarailchain weight	(kg/m)	0.9	0.95	1.07
Plarailchain material			PA10T GF40%	
Bracket material			SUS430	
Divider material			PA6 GF30%	
Operating temp. range	(°C)		-10 ~ 80	
Operating environment		Avoid using in acid/alkaline atmosphere or in hot water.		

*) Max. free span: The maximum length that Plarailchain can travel horizontally.

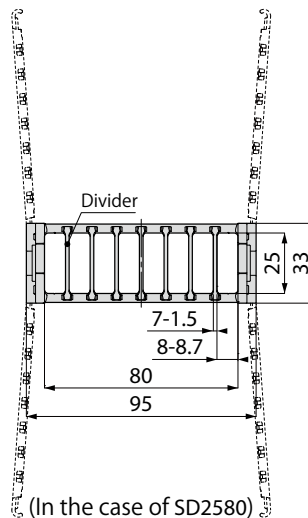
Outline Drawing



(In the case of SD2550)



(In the case of SD2560)



(In the case of SD2580)

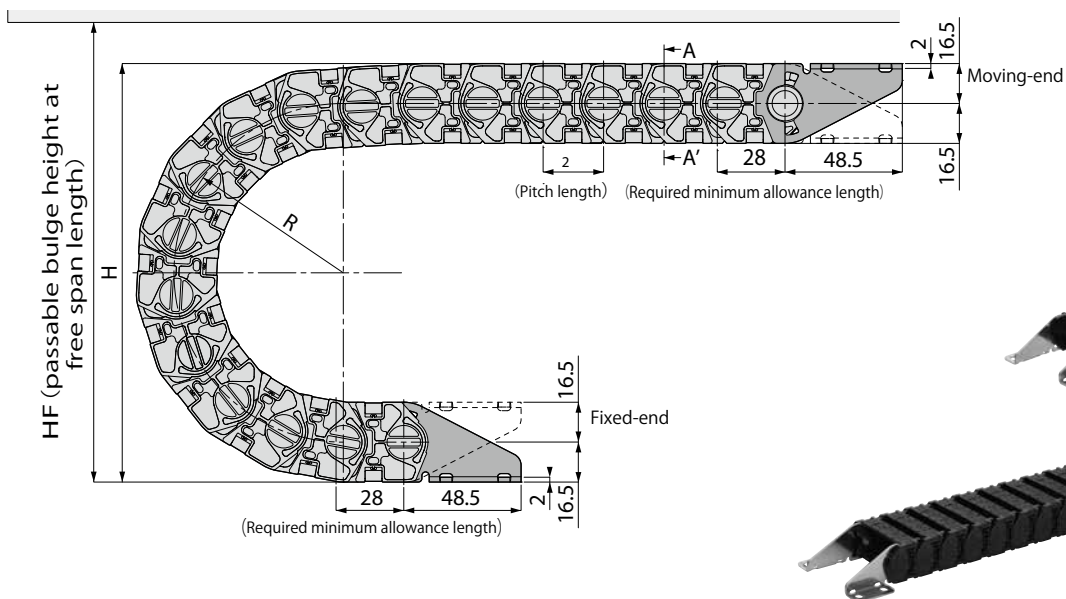
A-A'



Divider

Model Code

SB25-SD

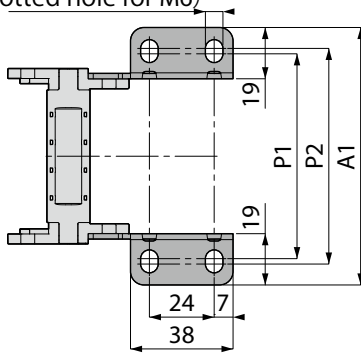


Unit: mm

Model Code	R	H	HF
SD2550-R50	50	133	150
SD2550-R70	70	173	190
SD2550-R100	100	233	250
SD2560-R50	50	133	150
SD2560-R70	70	173	190
SD2560-R100	100	233	250
SD2580-R50	50	133	150
SD2580-R70	70	173	190
SD2580-R100	100	233	250

Moving-end brackets (common to inner/outer radius, inside/outside settings) Model code: SD25-M

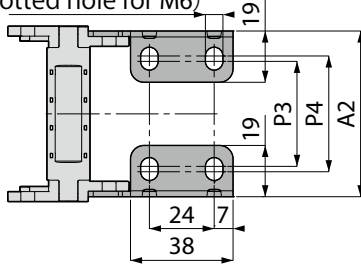
4-6.5 (Slotted hole for M6)



Unit: mm

Code	P1	P2	A1
SD2550	75.9	79.9	95.4
SD2560	85.9	89.9	105.4
SD2580	105.9	109.9	125.4

4-6.5 (Slotted hole for M6)

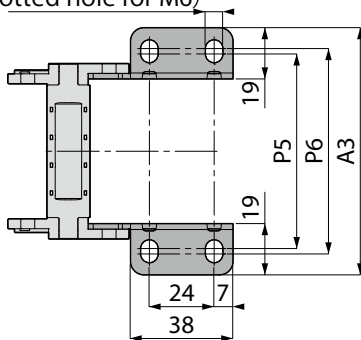


Unit: mm

Code	P3	P4	A2
SD2550	38.9	42.9	61.4
SD2560	48.9	52.9	71.4
SD2580	68.9	72.9	91.4

Fixed-end brackets (common to inner/outer radius, inside/outside settings) Model code: SD25-F

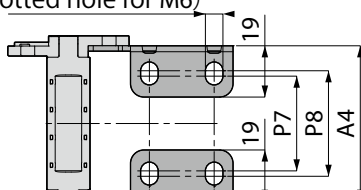
4-6.5 (Slotted hole for M6)



Unit: mm

Code	P5	P6	A3
SD2550	72.1	76.1	91.6
SD2560	82.1	86.1	101.6
SD2580	102.1	106.1	121.6

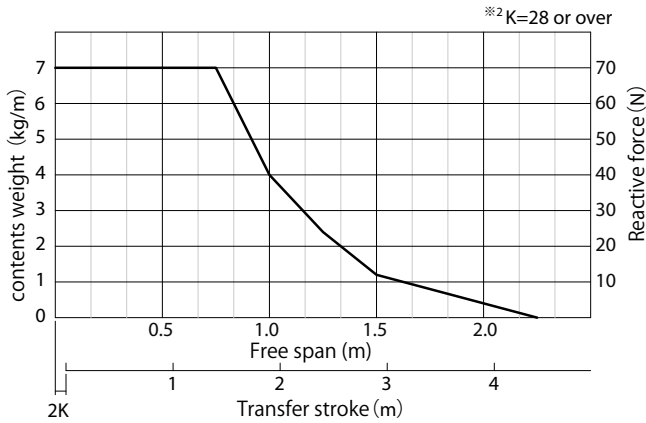
4-6.5 (Slotted hole for M6)



Unit: mm

Code	P7	P8	A4
SD2550	35.1	39.1	57.6
SD2560	45.1	49.1	67.6
SD2580	65.1	69.1	87.6

Capability Diagram



*1) The diagram is created under the condition that the fixed-end is in the middle of transfer stroke.

*2) K: Required minimum allowance length

Calculation of Numbers of Links

Number of links is to be calculated by the following equation.

$$n = \frac{2S}{P} + a + 1$$

n: Number of links (Figures below decimal point are raised to one positive number)

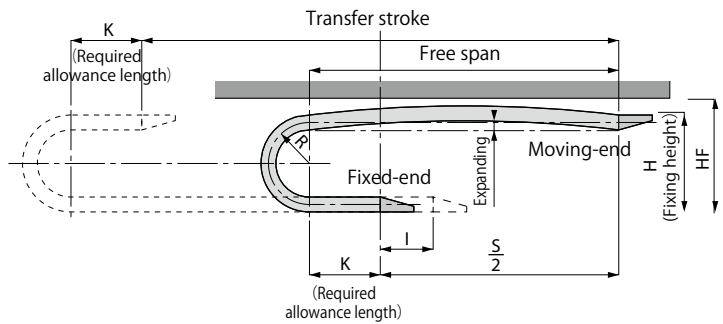
S: Transfer stroke (mm)

a: $\pi R + 2K$ (R: Bending radius (mm), K: Pl ay (mm))

l: Distance from intermediate point (mm) when the fixed-end is not in the middle of transfer stroke (when the transfer stroke is in the intermediate point : 0)

P: Pitch (mm)

Series	R	P	H	HF	K	a
SD 25 □	50	25	133	150	28	213.0
	70		173	190		275.8
	100		233	250		370.0



*1) HF in the above figure is the height which Plarailchain is able to pass through using under the length of free span with allowable expansion without load such as cables, hoses, etc.

*2) Please make inquiries for special travel conditions.

《Note》

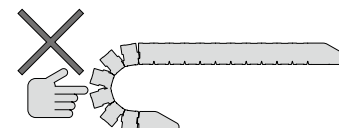
Setting fixed-end in the intermediate point of transfer stroke minimizes required number of Plarailchain.

Instruction Manual of Plarailchain SD

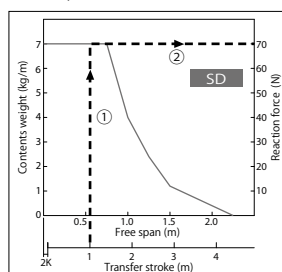
In order to understand the right usage of this product, please make sure to read this instruction manual before use. For fixation of products stored in Plarailchain (cables, tubes, etc) and installation of auxiliary parts such as guide-rail, please check our website.

⚠ Warning

- When connecting, disconnecting, opening and closing, or carrying out a maintenance check of Plarailchain, keep it from moving. There is a danger of self-moving or collapse by its own weight and getting injured.
- Be careful of the flexible part of the Plarailchain. There is a danger of pinching and getting injured your hands by caught in the flexible part.
- Please tighten up all the brackets certainly so that they do not loosen. There is a danger of breakage of the whole system if brackets loosen.
- An inertial force, mass load, and reactive force (the force that Plarailchain is going to lug out) are added to the mounting part of the Plarailchain depending on the specification of the system. When designing the mounting part, please secure sufficient strength. There is a danger to cause damage to the whole system when the strength of the mounting part is not enough.



In addition, the reactive force can be obtained from the capability diagram of each Plarailchain.



- Referring to capability diagram of the subject model, trace transfer stroke value to upper side. (As for the left diagram, this is an example when the transfer stroke value of the system is 1m.)
- From the crossing point with the capability curve, tracing it to the direction of reactive force axis. Intersected value becomes the maximum reactive force. (In the case of the left graph, the value is 70N.)

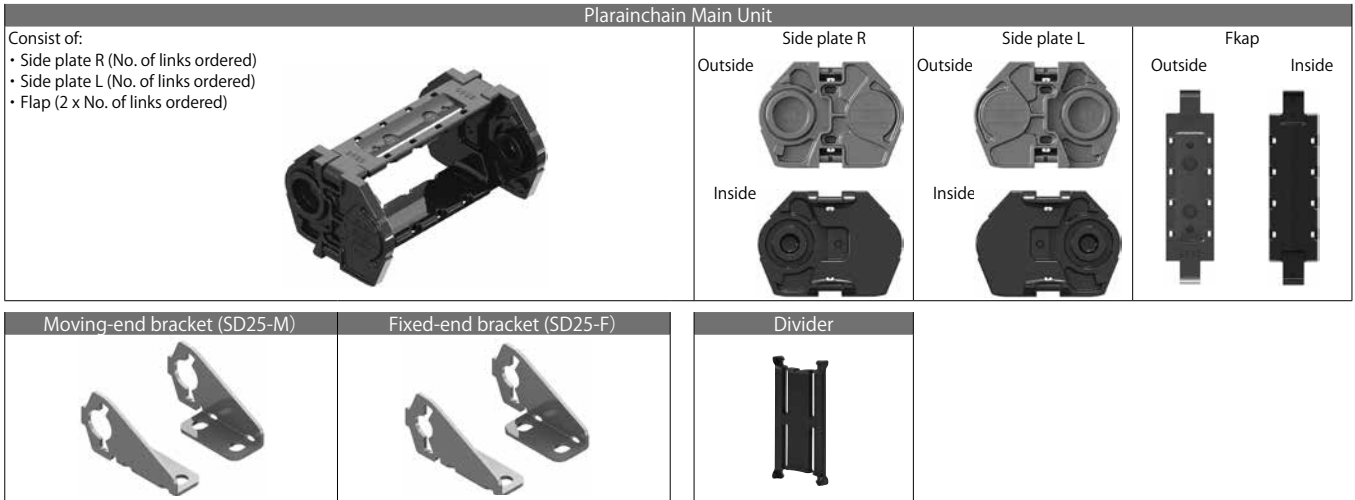
- Do not wash the product with water. It may cause malfunction.
- The cables and tubes to be stored in the Plarailchain should be fixed as close as possible to the attachment points on both ends. Failure to do so may cause the cables and tubes to fly out of the main unit, or may cause damage to the entire system due to excessive wear caused by tension.
- Do not subject cables and tubes stored in the Plarailchain to tension, twisting, extreme bending, or excessive fastening or binding. Doing so may result in crushed or broken cables, crushed tubes, ruptures, or disconnections.
- Use dividers, racks, and dividing sheets to prevent cables and tubes stored in the Plarailchain from rubbing or getting caught and scratched. This may cause cables to break or tubes to burst.

⚠ Cautions

- Please check the "Plarailchain Capability Diagram" carefully to select the most suitable Plarailchain. Please test it before use because there are various factors that may affect the use of the chain.
- The Plarailchain is set to expand to the outer circumference when the contents are not stored, in order to prevent drooping when the contents are stored.
- The length of the Plarailchain can be adjusted by increasing or decreasing the number of links. When designing or when length adjustment is required, please check the link calculation formula and calculate the required number of links.
- When installing the Plarailchain on the equipment, make sure that the fixtures at the moving end and the fixed end are installed parallel to each other along the axis of travel. If the Plarailchain runs with torsion, it may cause damage to the entire installation system.
- Cables, hoses or tubes to be stored must be excellent for flexibility and wear resistance for movement. Do not use the wire-braided outer ones since they are perishable.
- Depending on conditions, such as when the weight of cable or tube is heavy and the moving speed and acceleration are fast, the area around the bend may swell due to inertia at the start of moving or immediately after stopping. When designing, ensure that there is sufficient HF dimension. (HF: passable bulge height at free span length)
- The amount of cables and tubes to be stored should be within 70% of the content of the Plarailchain.
- Cables and tubes should be stored in the Plarailchain as horizontally as possible without crossing each other.
- The contents should be arranged in a well-balanced in right, left, up and down, especially if they are of different diameters so that they do not ride up and cross each other.
- Do not apply undue load to the metal bracket.
- When storing items with different contents (air tubes, water tubes, conductors, etc.) together, please select the bending radius of the Plarailchain according to the largest bending radius of the items to be stored.
- Always wear gloves and wear adequate equipment to avoid injury when using designated tools for assembly, disassembly, opening and closing flaps, etc.
- It may cause fall-out of Plarailchain or may cause disassembling during operation if the assembly is incomplete. Please carefully read the instruction manual and understand proper steps.
- A flat-blade screwdriver of which tip width 3mm is used to open the flap, so please prepare your own.

1. Factory shipped Form

Metal brackets are not included with Plarailchain. Please purchase metal brackets separately.



2. How to install brackets

Insert the bracket aligning the bracket hole with the boss of Plarailchain. Make sure there is no space between the brackets and the Plarailchain.

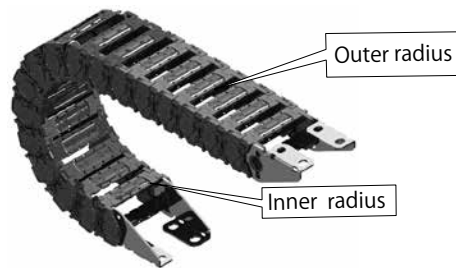
● Moving-end brackets (common to inner/outer radius, inside/outside settings)

● Fixed-end brackets (common to inner/outer radius, inside/outside settings)



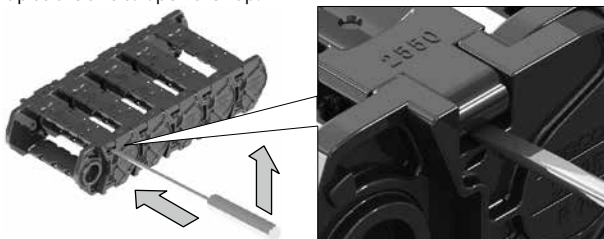
3. Opening and Closing Flap

Flaps open both sides of outer radius and inner radius.

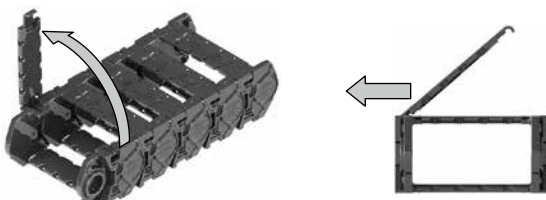


● How to open flap

(1). Insert the flat-tip driver in the slot on the side plate and lift it with the tip as the axis to open the flap.

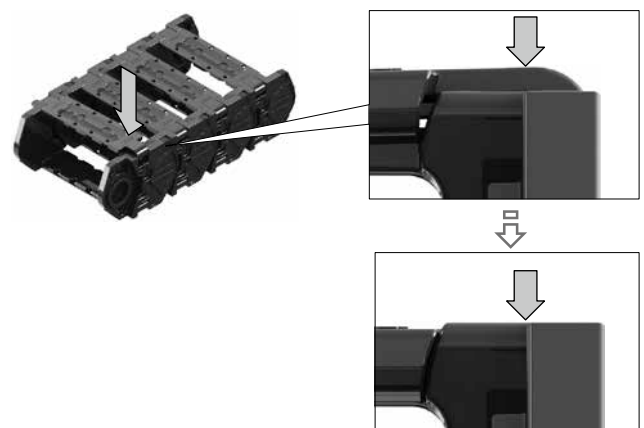


(2). Push the flap sideways when it opens in the range of 40 - 55 degree to remove it.



● How to close flap

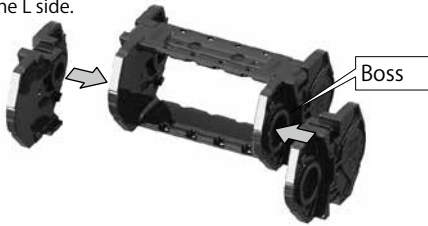
Push down the flap until it clicks into place. Check if it is fixed to the side plate certainly.



4. How to Increase Links

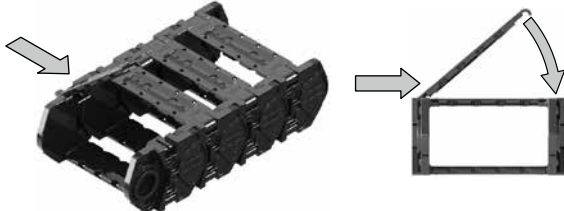
(1). Side plate assembly

Insert the side plate of R and L to the boss on each side.
Plarailchain does not work if L is mounted on the R side and R is mounted on the L side.



(2). Flap assembly

Same assembly work is done on outer and inner flap.
Mount a flap to one side of the side plate by pushing it in place holding the opening angle in the range of 40 - 55 degree.
Refer to "3. Opening and Closing Flap" mentioned in the previous page, and close the flap.
Once one side of the flap is installed, push the other side of the flap in place until it clicks.
Make sure the flap is certainly fixed on the side plates.



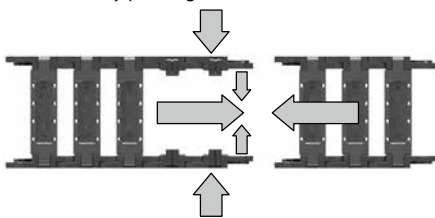
6. Connection of multiple links

Referring to "3. Opening and Closing Flap";

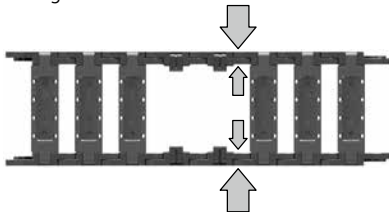
(1). Remove 2 flaps each side of inner and outer radius where you want to connect more links.



(2). Connect the links by pushing them from the both sides.



(3). Hold down the links from outside and inside firmly fitting the hole and the boss together.



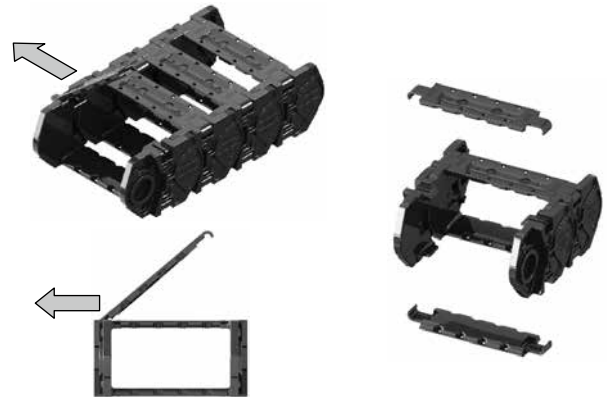
(4). Put back the flaps removed.



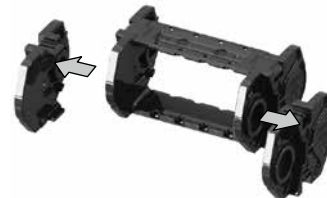
5. How to reduce links

(1). Open the flap referring to "3. Opening and Closing Flap".

Slide off the flap holding the opening angle in the range of 40 - 55 degree.
Remove both the flaps of outer and inner radius.



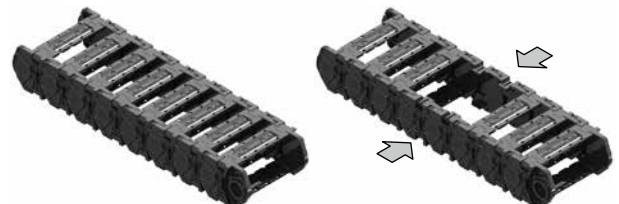
(2). Remove the side plates by pulling sideways.



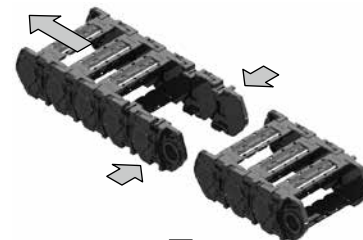
7. Separation of multiple links

Referring to "3. Opening and Closing Flap";

(1). Remove the 2 flaps each from outer side and inner side. Then, loosen the boss and the hole of disconnecting point by pushing them from the both sides.



(2). Detach the links when the boss and the hole come off.



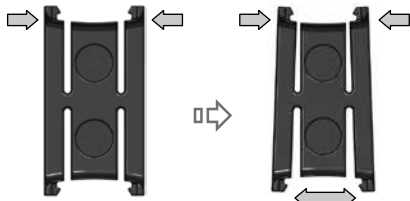
(3). Put back the 2 flaps removed.



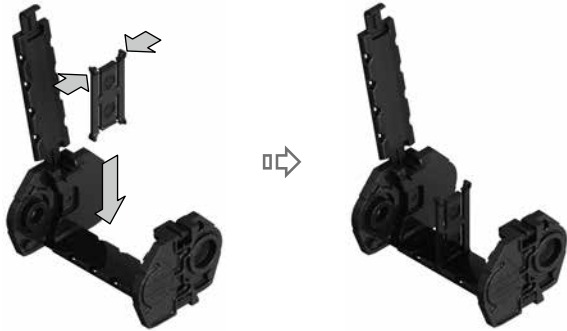
8. Divider installation

Referring to "3. Opening and Closing Flap";

- (1). Open the flap.
- (2). Pinch the upper side of divider to open the bottom side.



- (3). Install the divider so that the divider hook fits to the groove on the flap.



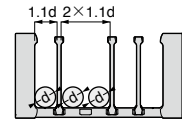
- (4). Close the flap.



Divider should be installed spaced from each other more than 1.1 times of the diameter of cable or tube. The pitch of groove for dividers on Plarailchain is 8.8mm for SD2550 and SD2560, and 8.7mm for SD2580.

The number of dividers can be installed on 1 link

- SD2550-4 dividers
- SD2560-5 dividers
- SD2580-7 dividers



It is recommended to install the divider in every other link. Also, if multiple dividers are needed, do not install dividers next to each other as much as possible.




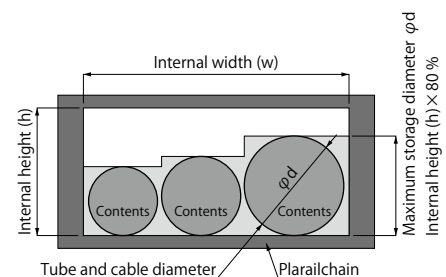
Recommended installation of 1 divider per link



Recommended installation of multiple dividers per link

9. Cautions on Installing Cables / Tubes

- The amount of cables and tubes to be stored should be within 70% of the content of the Plarailchain = internal height (h) × internal width (w). (Refer to the  part of the picture on the right.)
- Select a type of cables and tubes whose diameter stays within 80% of the inner height (h) of the Plarailchain. (Refer to the picture on the right.)
- When storing items with different contents (air tubes, water tubes, conductors, etc.) together, please select the bending radius of the plarailchain according to the largest bending radius of the items to be stored.
- By installing the divider, the contents set in array can be kept intact. This is very effective against wear and scraping.
- Cables and tubes should be stored in the plarailchain as horizontally as possible without crossing each other.
- Cables and tubes should be arranged and stored in a balanced manner.
- The contents should be arranged in a well-balanced in right, left, up and down, especially if they are of different diameters so that they do not ride up and cross each other.
- Fasten the contents at both ends of the plarailchain in order to prevent the contents from being pulled or overloaded.



*) Provide a gap of $\phi d \times 0.1$ between the main body of the Plarailchain and adjacent contents.

Various types and sizes are available

Plarailchain series

Standard type



HPU



Flap can be opened on either side.

HPO

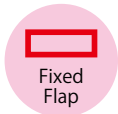


Full cover type that contributes to preventing entry of dust.

HPE



Storing space is divided in half. Cables and tubes can be stored separately.



HPK



Small type that can be used for single tube and cable.

HPM



Full cover type with low cost.

HPC



Simple flap type. Cables and tubes can be put in or out without tool.

High durability Type



SP

SPO



Low wear and noise type with excellent durability.

Full cover type is available for some sizes.

Low noise·low dust emission type



SC

SCL



Hinge connection type with less friction between links.

Space-saving Type is available.

Clean
Class level
1000

Accessories for Plarailchain

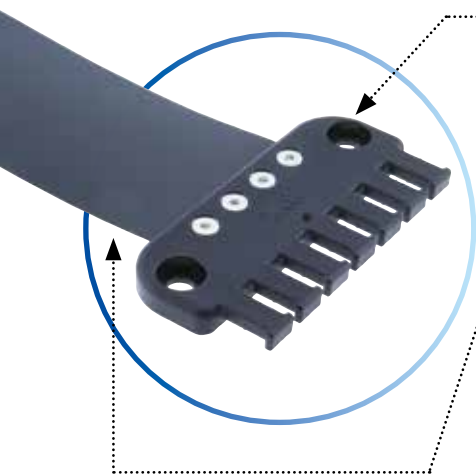
Cable Clamp & Dividing Sheet



Easily fix tubes and cables.

Simply fasten with cable ties!

Reduce drawn-in or protruded cables which may cause **Wear and Tear.**



Cable clamp CC

- ▶ 7 types, from 4 to 10 comb-teeth, are available according to the plate width.
- ▶ By using spacers, cables can be organized into double tier.
- ▶ Plate with dividing sheet is also available.



Dividing sheet TS

- ▶ Convenient to organize cables and tubes into double tier.
- ▶ Reduce wear between tubes and cables.
- ▶ Can be ordered with preferable length in 5mm increments.



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