



For protection and guiding of cables and tubes

Plarailchain SD

High-spec type sturdy and durable enough for

High travel speed applications



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.

Increased resistance to sagging

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

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 steal (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 to handle

Easy Installation

regardless of mounting condition !

*Comparison with our Plarailchain SP.

Effortless insertion and removal of contents

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

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.





Side Plate

Dual connection

structure supported by both inner and

outer rings.





Model Designation (Example) Divider Model Code SB25-SD SD Bending Radius R50 Code R70 R100 Bending radius (mm) 50 70 100 Divider for Plarailchain SD ① . Size (Storing dimensions: H x W) Code 2550 2560 2580 Size (mm) 25×50 25×60 25×80

High resistance, low abrasion, low noise, open-close flap type

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	For moving-end			For fixed-end						
Screwing position		Inside		Outside	2		Inside		Outside	
Orientation	Outside	Inside	Outside	Ins	ide	Outside	Inside	Outside	Insic	le
Туре		Model code		Weight (g)	Price (¥)		Model Code		Weight (g)	Price (¥)
SD2550										
SD2560	SD25-M			45.7	500	SD25-F			47.8	500
SD2580										

*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



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		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



16.5 28 48.5 (Required minimum allowance length)

Unit: mm

Model Code	R	Н	HF	Price (¥) (/ 1 link)
SD2550-R50	50	133	150	
SD2550-R70	70	173	190	435
SD2550-R100	100	233	250	
SD2560-R50	50	133	150	
SD2560-R70	70	173	190	470
SD2560-R100	100	233	250	
SD2580-R50	50	133	150	
SD2580-R70	70	173	190	520
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

Unit: mm

4-6.5 (Slotted hole for M6)

			Unit. min
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)



2	<u>de:: SD25-F</u>			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
P7	P8	A4
35.1	39.1	57.6
45.1	49.1	67.6
65.1	69.1	87.6
	P7 35.1 45.1 65.1	P7 P8 35.1 39.1 45.1 49.1 65.1 69.1

Capability Diagram



Calculation of Numbers of Links

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



- n: Number of links (Figures below decimal point are raised to one positive number)
- S: Transfer stroke (mm)
- a: π R+2K (R: Bending radius (mm), K: Pl ay (mm))
- I: 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	Р	Н	HF	K	а
SD	25 🗆	50 70 100	25	133 173 233	150 190 250	28	213.0 275.8 370.0

《Note》

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

- *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



- *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.



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.

<u>∧</u> Warning

- 1. When connecting, disconnecting, opening and closing, or carrying out a maintenance check of Plarailchain, keep it from moving. There is a danger of selfmoving or collapse by its own weight and getting injured.
- 2. 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.



3. 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.

- 4. 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.



- ①. 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.)
- ② . 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.)
- 5. Do not wash the product with water. It may cause malfunction.
- 6. 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.
- 7. 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.
- 8. 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

- 1. 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.
- 2. 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.
- 3. 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.
- 4. 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.
- 5. 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.
- 6. 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)
- 7. The amount of cables and tubes to be stored should be within 70% of the content of the Plarailchain.
- 8. Cables and tubes should be stored in the Plarailchain as horizontally as possible without crossing each other.
- 9. 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.
- 10. Do not apply undue load to the metal bracket.
- 11. 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.
- 12. Always wear gloves and wear adequate equipment to avoid injury when using designated tools for assembly, disassembly, opening and closing flaps, etc.
- 13. 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.
- 14. A flat-blade screwdriver of which tip width 3mm is used to open the flap, so please prepare your own.

1. Factory shipped Form



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

 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.



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) \times 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.

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 SD2560-5dividers

SD2580-7dividers



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.





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

PISCO®

Various types and sizes are available **Plaraichain** series





Accessories for Plarailchain

Cable Clamp & Dividing Sheet



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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