

CEO Greeting

We are CPS that realizes the customer's impression is decided by the customer satisfaction.

CPS is the leading company to develop the cable protection system. We are manufacturer of cable chain(Energy chain), flexible tube(corrugated tube), connectors, robot-kit and Roboway(robot dresspack system).

We are the only-one manufacturer who has localized these all products and is continuously developing them in Korea.

All of our product are manufactured based on the quality control system of ISO9001 and environment control system of ISO14001. Also our product and production system got certified on global standard such as CE, VDE, UL, IPA, TUV(Noise Testing), ATEX and etc.

With our well organized research institute and reliability test lab, we are continuously developing and improving our product to the best to offer customers.

We manage systematically production system from high quality material to delivery service. With efficient management system, we guarantee reasonable price with high quality product against competitors and fast delivery service for customers.

We will do our best effort to offer the best quality product, diverse solutions for customers with our management value that indicates "enterprise shall be disappeared right after stopping technical development".

Thank you all,



CEO
Kyung Min, Kim

CP SYSTEM CO.,LTD.

Technology and quality as much as any third party may have a higher self-esteem.

We've not satisfied with the current.

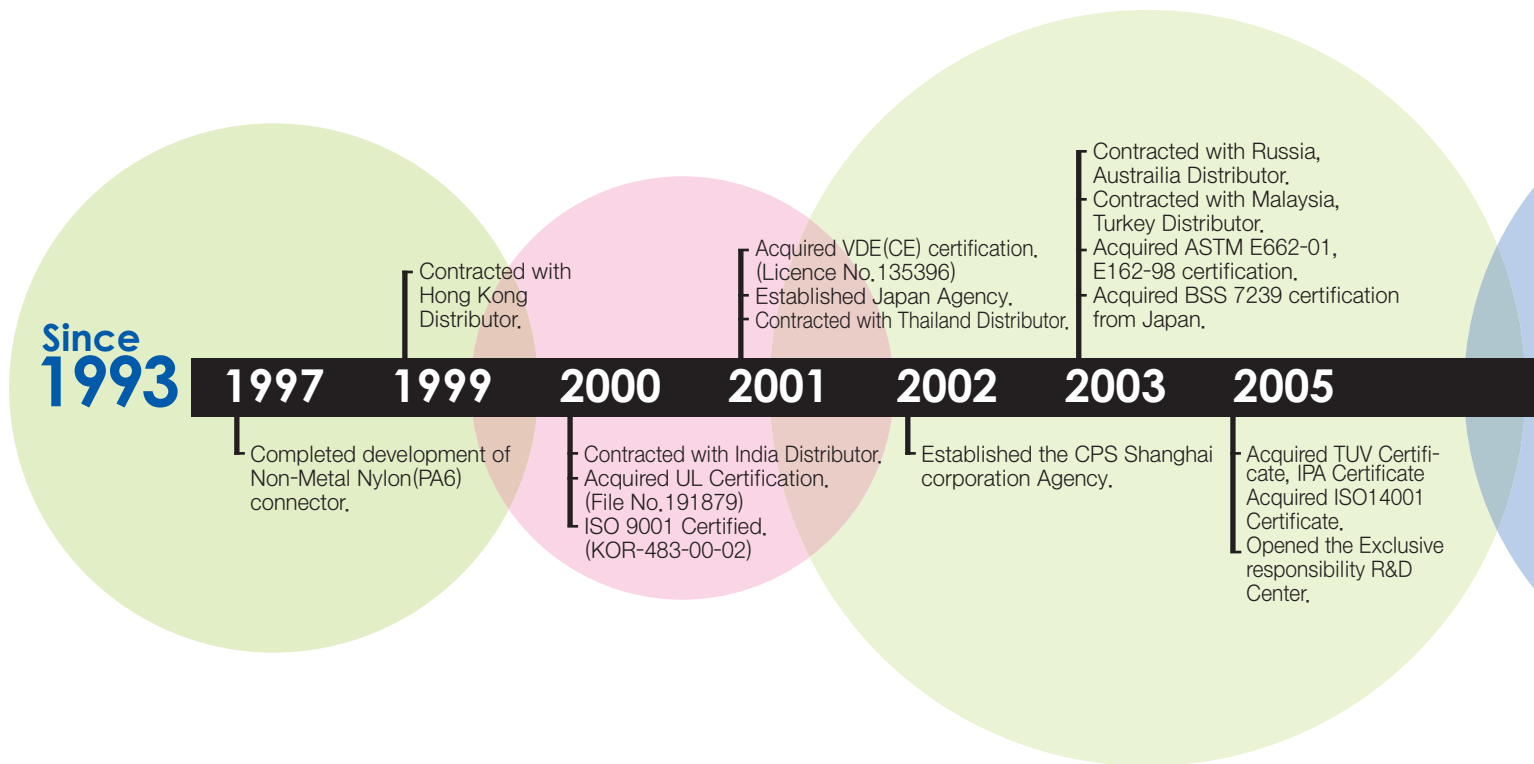
*To meet greater customer satisfaction,
we will continue to strive to develop new technologies.*

*The best quality, best service and
new product development under a management philosophy is
what CPS is committed for innovation.*



Company	CP System co., ltd
Established	Jan-1993
Business Sector	Manufacturer of Cable chain, Flexible tube, Connector and Roboway
Headquarter & Factory	Busan, South Korea.
Website	www.cpsystem.co.kr
E-mail	overseas_info@cpsystem.kr
+Phone	+82 51 526 4393 (Overseas sales Dept.) +82 70 4825 0808 / 0806 (Overseas sales Dept.)

Company History



Management Value



Be Creative

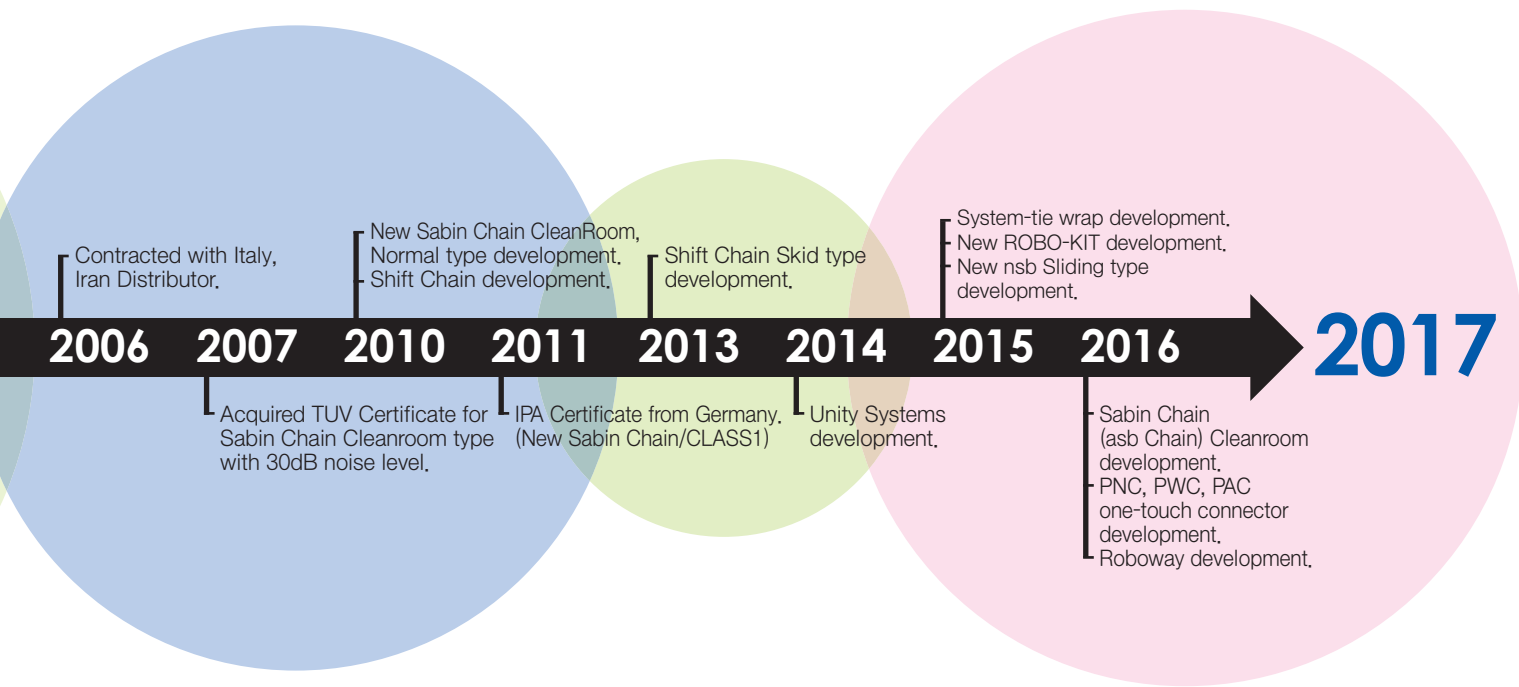


Challenge



Be Faithful

Have creativity
Enjoy challenge
Be faithful



As Quality Management, we are trying to offer the best quality and service. And also we are trying to meet satisfaction of customers by developing new products continuously.

ve thinking..!
allenges...!
hful....!



The Best Quality



The Best Service

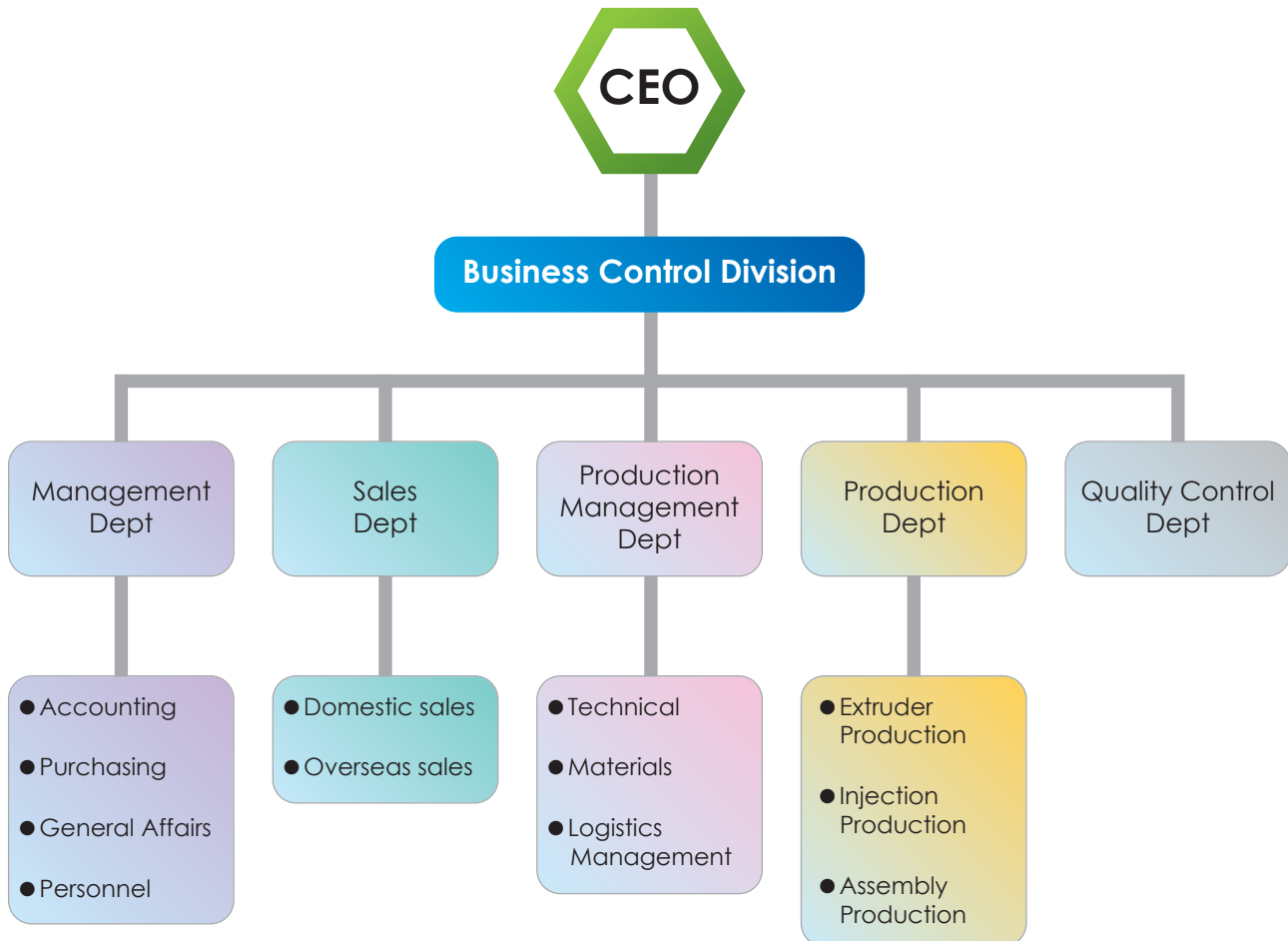


New Product Development

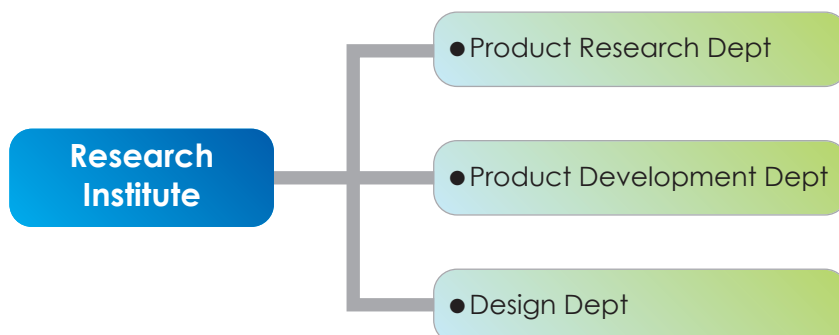
Company Organization

- CPS Headquarter and Factory is located in Busan, South Korea.
Also, we have individual Research Institute to develop product and improve its quality continuously from 2005.

Headquarter & Factory



Research Institute(R&D Center)



Research Institute

- CPS Research Institute is striving to develop product and improve quality continuously from 2005 and it developed various range of quality product. As a part of development and improvement of product, they are also researching and experimenting raw material to create the best quality product.



Recent Research Performance

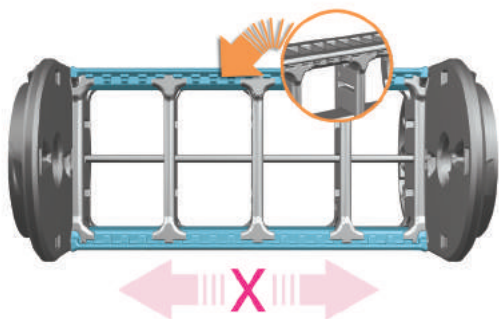
- Sabin Chain Cleanroom type Development
- Robo-kit Development
- Sabin Chain Enclosed type Development
- Shift Chain Development
- Shift Chain Enclosed type Development
- Shift Chain Roller Skid type Development
- Shift Chain Skid type Development
- Unity systems Development
- Sabin Chain Skid type Development
- Roboway system Development
- PNC, PWC, PAC Connector Development
- PAM Development

What's the cable chain?

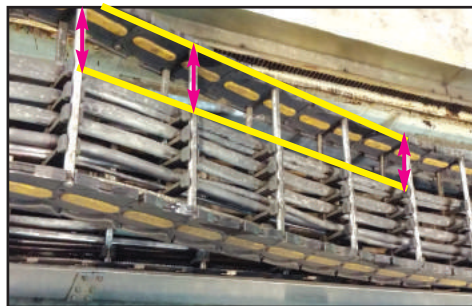
- Cable chain is to protect cables of moving machinery or automatic machinery. Without cable chain, it causes damage to cables. Hence cables can be protected by using suitable cable chain and it should be considered its stroke, cable types of machinery.

Good cable chain?

- Protect cable to be longer lifetime of cable
 - Divider never moves



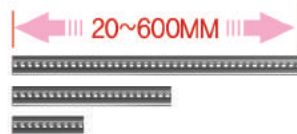
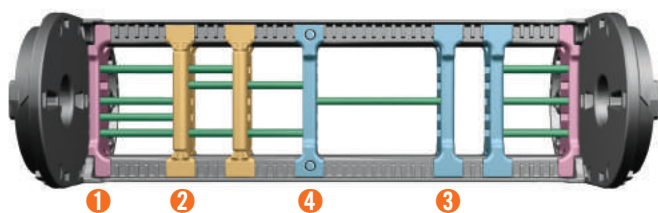
< Bad case >



If dividers move during operation, cables can be
 1. focused toward one side or,
 2. lost tension or,
 3. twisted.



- Can make section composition



Separator (SP)



Separator Pin



① DV-S



② DV-R



③ DV-M



④ DV-T

1. **Making section** is the one important criteria whether supplier has high technology or not. Without section composition, it's not possible to guarantee long lifetime of cable because of friction and losing tension of cables.
2. **We have five units for making section.**
It can protect cables more efficiently and safely by making suitable sections with diverse combination of Dividers and Separators.
3. The length of separator can be cut from 20 mm to 600 mm and be cut and used 5 mm apart.

- Characteristic of plastic frame

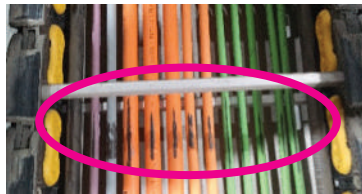
Frame(Bar) must be made by engineering plastic.

Friction factor of plastic(synthetic resins) against plastic(synthetic resins) is lower than plastic(synthetic resins) against aluminum(or steel) and it factor makes sure of protection for cables for long time.

In addition, as plastic is lighter than aluminum and steel, it also guarantees long self-supporting length of cable chain.



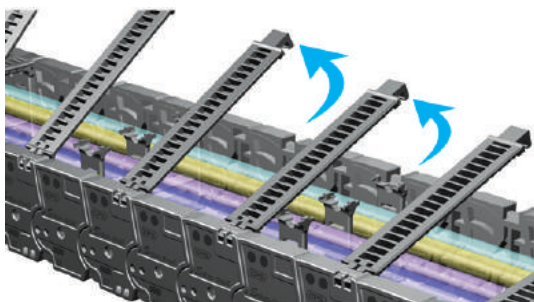
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- Strong side band and frame structure

Self-supporting length is decided by side band's structure. If there's many supporting points between each side band when assembled, its self-supporting lengths sustain long.

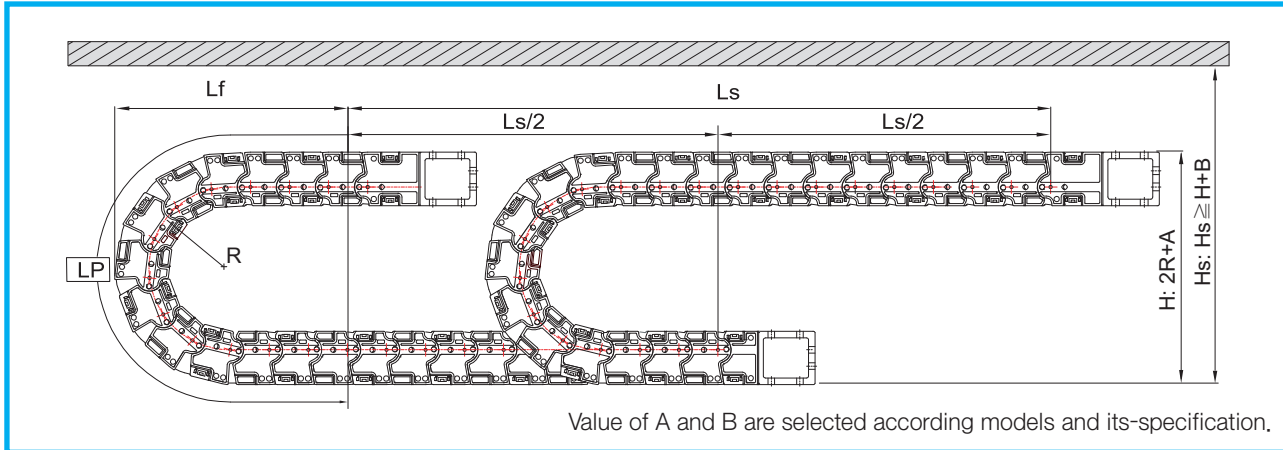
During the operation at high speed or tough circumstance, there is a possibility of seperation of frame.
Good frame structure means frames are strongly assembled with side bands, so they are not seperated during operation.



How to calculate?

L : Cable chain length R : Bending radius value
 LS : Machine Stroke HS : Safe Space
 LP : loop length H : Height(minimum)

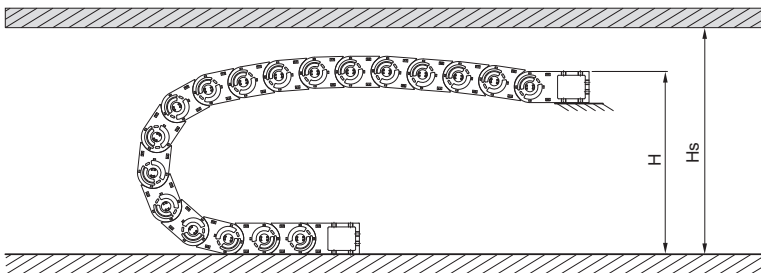
• Calculation of Cable chain's length



• Calculation of Cable chain's length

- BR Value(Min) > 8 ~ 10 x the biggest cables' outer diameter
- BR Value(Min) > 15 ~ 20 x the biggest hydraulic hose's outer diameter

• Calculation of Height(H value)



$$2R + B = H$$

- R : Bending radius value
- B : Outer height of cable chain

$$HS \geq H + \text{“S Value”}$$

• “S Value”

- CPS mini chain

CPS015	CPS020	CPS030	CPS033
10mm	15mm	30mm	30mm

- Shift chain

ST044N/E	ST055N/E	ST072N/E	ST095N/E	ST120N/E	ST150N/E
30mm	35mm	40mm	50mm	60mm	80mm

- asb chain

asb028CR/CR,L	asb035CR/CR,L	asb045CR/CR,L
30mm	30mm	40mm

- nsb chain

nsb020CR	nsb022CR	nsb028CR/N/E	nsb035CR/N/E	nsb045CR/N/E	nsb060CR/N/E	nsb075CR/N/E
30mm	30mm	30mm	30mm	40mm	40mm	60mm

- **How to select alternative model for other brand**

When customers should select alternative models, they must check the following value exactly.

- Model number of existing model,
- Outer width of cable chain,
- Inner width of cable chain,
- Outer height of cable chain,
- Bending radius value,
- H value or HS value,
- Total machine stroke or length of cable chain,
- Speed of machine

- **How to select alternative model for CPS's discontinued models produced until 2010**

- Alternative model table for CPS Normal type

CPS Chain Normal type Discontinued production in 2010	Shift Chain Normal type	nsb Chain Normal type
CPS036N	ST044N	nsb028N
CPS050N	ST055N	nsb035N
CPS068N	ST072N	nsb045N
CPS077N	ST072N	nsb045N
CPS095N	ST095N	nsb060N
CPS120N	ST120N	nsb075N

- Alternative model table for CPS Enclosed type

CPS Chain Enclosed type Discontinued production in 2010	Shift Chain Enclosed type	nsb Chain Enclosed type
CPS036E	ST044E	nsb028E
CPS050E	ST055E	nsb035E

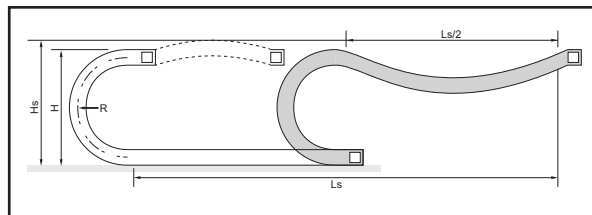
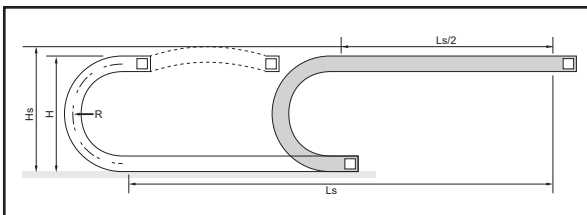
- Alternative model table for CPS Sliding type

CPS Chain Sliding type Discontinued production in 2010	Shift Chain Normal type	nsb Chain Normal type
CPS036S	ST044S	-
CPS068S	ST072S (Discontinued production in 2017)	nsb050S
CPS077S	ST072S (Discontinued production in 2017)	nsb050S
CPS095S	ST095S (Discontinued production in 2017)	nsb065S
CPS120S	ST120S (Discontinued production in 2017)	nsb080S

- Alternative model table for sb chain CR type

sb Clean Room type Discontinued production in 2010	asb chain Clean Room type	nsb Chain Clean Room type
sb018CR	-	nsb020CR
sb020CR	-	nsb022CR
sb025CR	asb028CR	nsb028CR
sb035CR	asb035CR	nsb035CR
sb045CR	asb045CR	nsb045CR
sb060CR	-	nsb060CR
sb075CR	-	nsb075CR

Self-supporting / Short Stroke



• Self-supporting application

- Self-supporting means that cable chain moves on not sagging and touch-down condition. We call it “self-supporting” or “unsupported length”. It’s general type of cable chain and CPS’ cable chain is very suitable for high speed line and guarantees long lifetime. It could be varied due to inside weight or type of cable chain. There are 3 sections regarding self-supporting.

- Self-supporting section without sagging - SPg

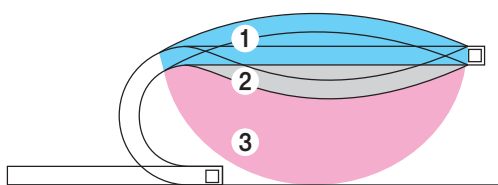
When customer need stable operation of cable chain, they need to keep like No.1 in the picture. It’s the most stable operation.

- Allowable sagging section within self-supporting section - SPa

If sagging volume is within 50mm like No.2 in the picture, it’s called “SPa”. It’s allowable to operate cable chain, even though it’s sagging, however, it could be problem when its speed is fast or its number of moving time is many.

- Exceed limit of sagging

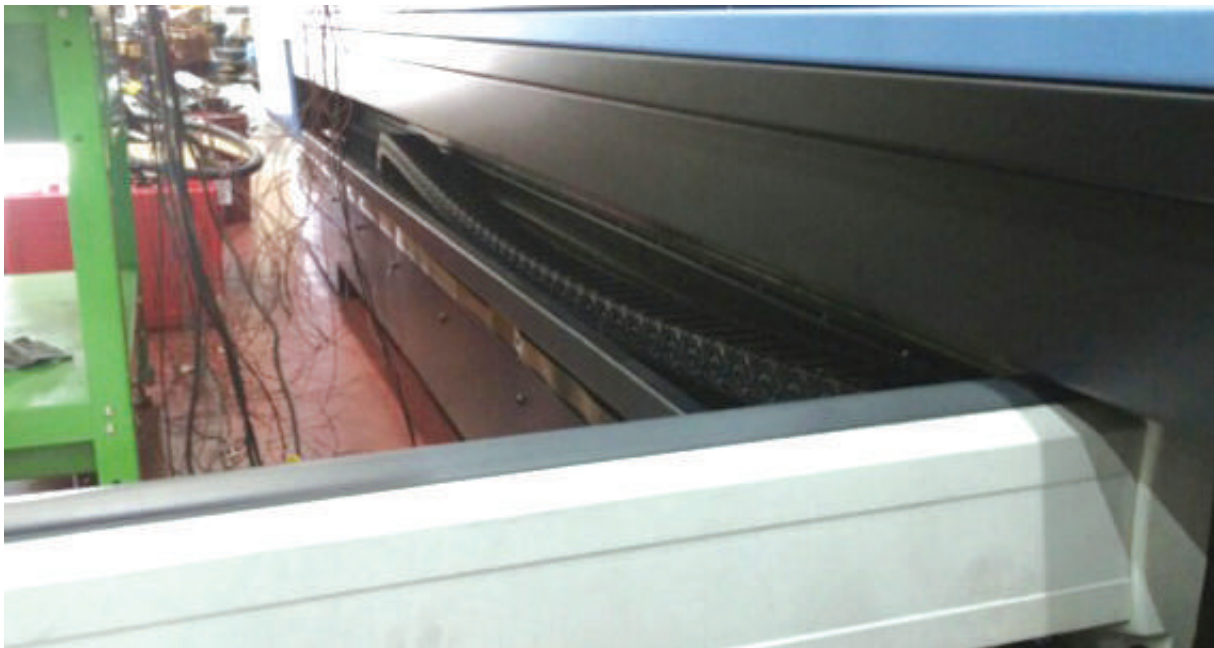
If sagging degree is formed like No.3 in the picture, it’s dangerous to operate anymore. It usually happens cased after long period usage, thus, customers must replace cable chain with new one immediately.



① SPg. Self-supporting is good without sagging.

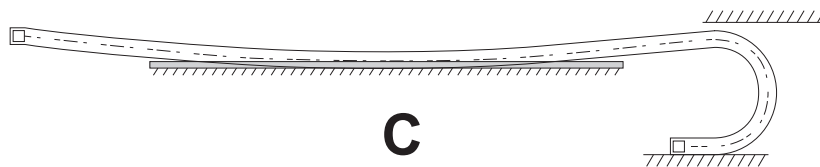
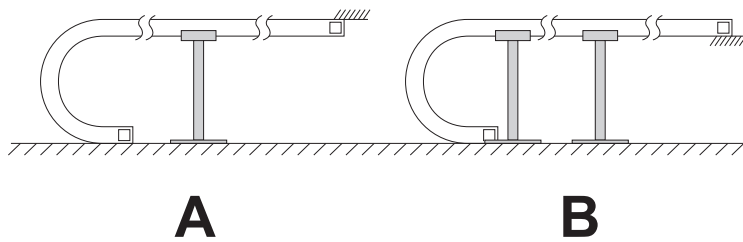
② SPa. Allowable sagging section within 50mm. It’s fine.

③ You can’t use this condition for cable chain Normal type. You need to replace it with sliding(skid) type of cable chain.

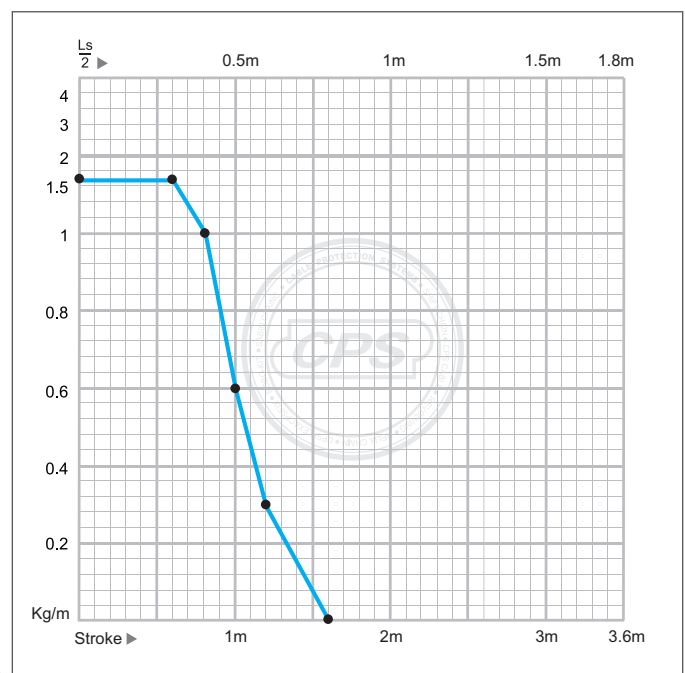
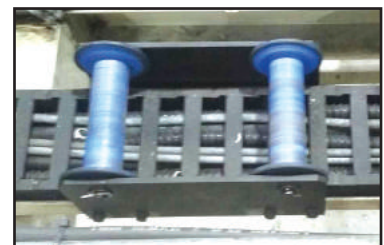


• **What to do for not enough self-supporting length maintained**

1. Select suitable model and type.
2. Otherwise, it is necessarily to install supporting guide as below;



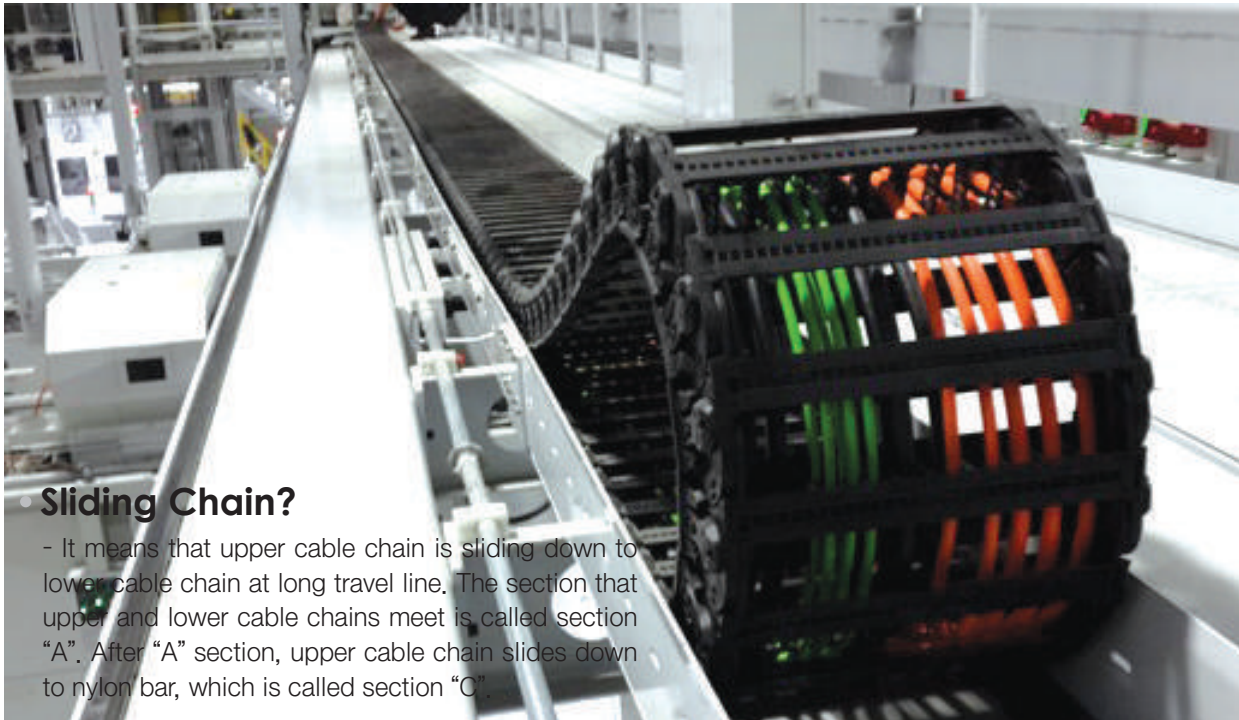
<Supporting Guide>



► **How to read a graph**

Kg/m means weight of bare cable chain.
Stroke means the travel length of machine movement.

Sliding type / long Stroke

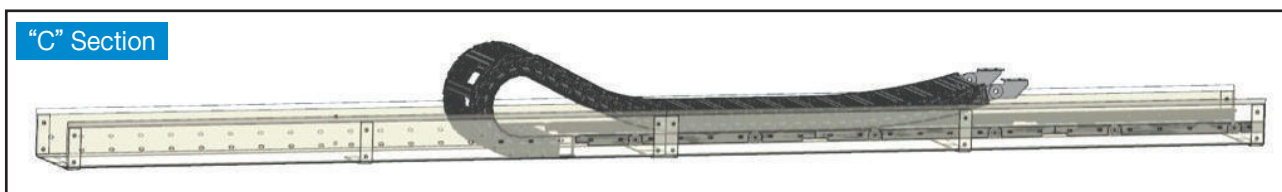
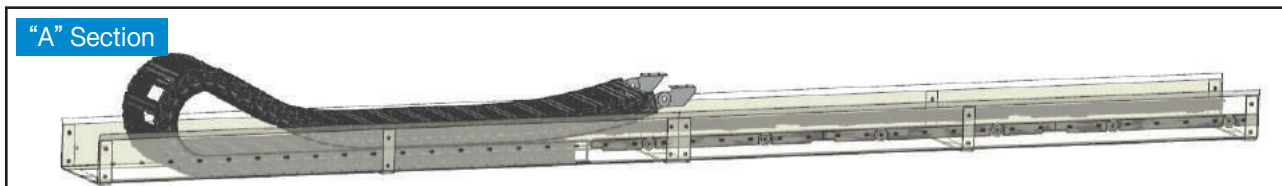


• Sliding Chain?

- It means that upper cable chain is sliding down to lower cable chain at long travel line. The section that upper and lower cable chains meet is called section "A". After "A" section, upper cable chain slides down to nylon bar, which is called section "C".

• Guide Channel?

- The guide channel system is applied to long stroke circumstance. Guide channel consists of 2 sections such as "A" section and "C" section. "A" section is for both cable chain(Upper + down side) and "C" section is cable chain + nylon bar.



• Advantage of Movement in low position

As we recommend low height application for moving bracket part to ensure that ;

1. It can save space,
2. It can make longer lifetime by reducing abrasion.
3. It can move longer.

- **Advantage of long stroke cable chain.**

- Stable operation
- Long lifetime(at least over 2 million times)
- Ultimate design for special circumstances
- We have experts who have various and long experience



- **Must inform us of information below to make ultimate design for you.**

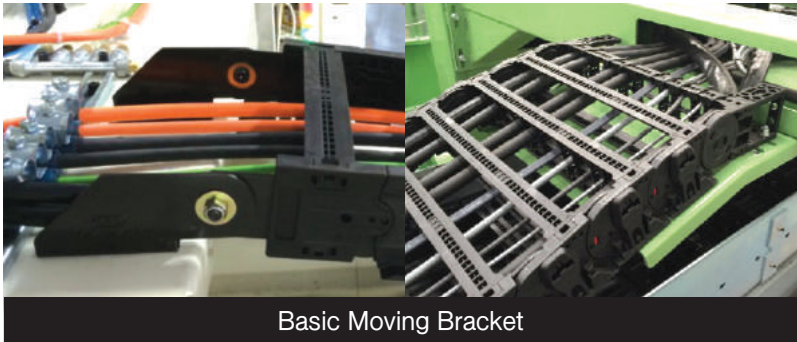
- Machine stroke, speed, acceleration, weight(cables and hoses), specification of cables and hoses, necessary bending radius value, operating cycle(per 1 day or per 1 month) and other relevant conditions
- Contact us at overseas_info@cpsystem.kr



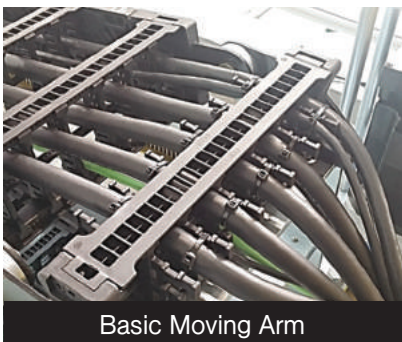
ST120RS

- ▶ **Specification**
Thermoelectric power plant
- ▶ **Location**
Korea(Hadong)
- ▶ **Stroke**
198 meters

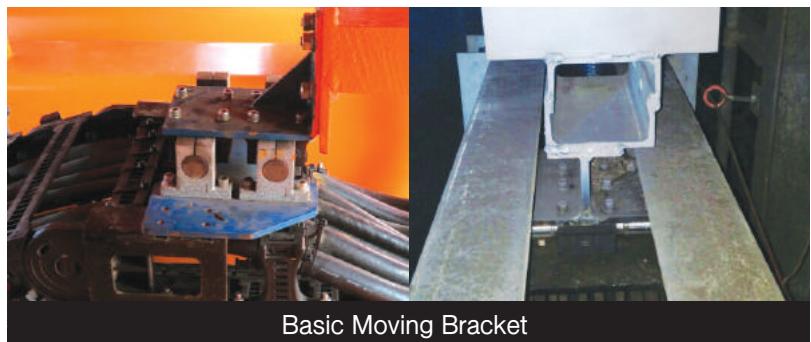
- **Moving Bracket & Moving Arm**



Basic Moving Bracket

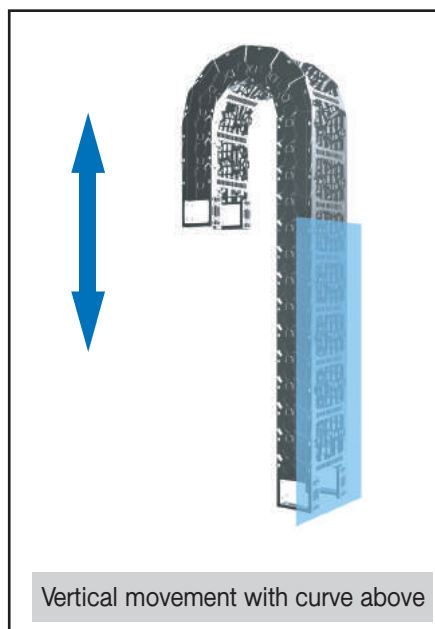
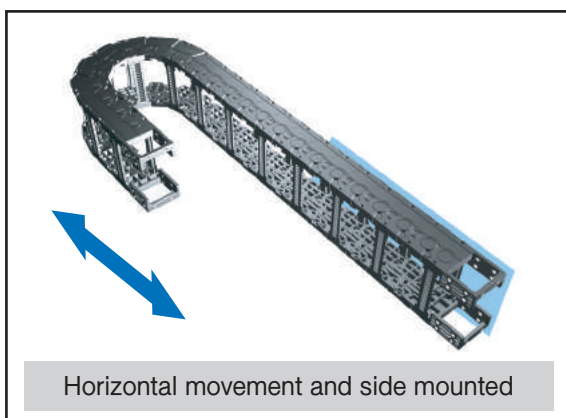
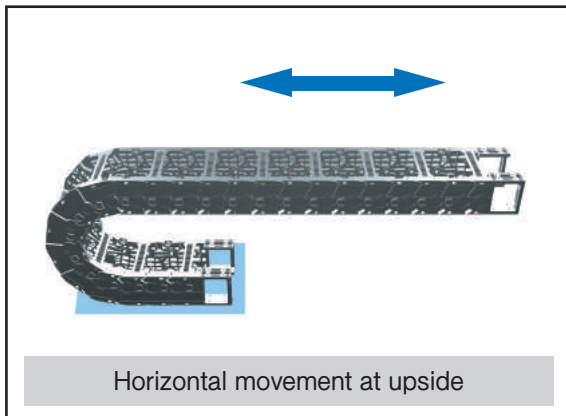
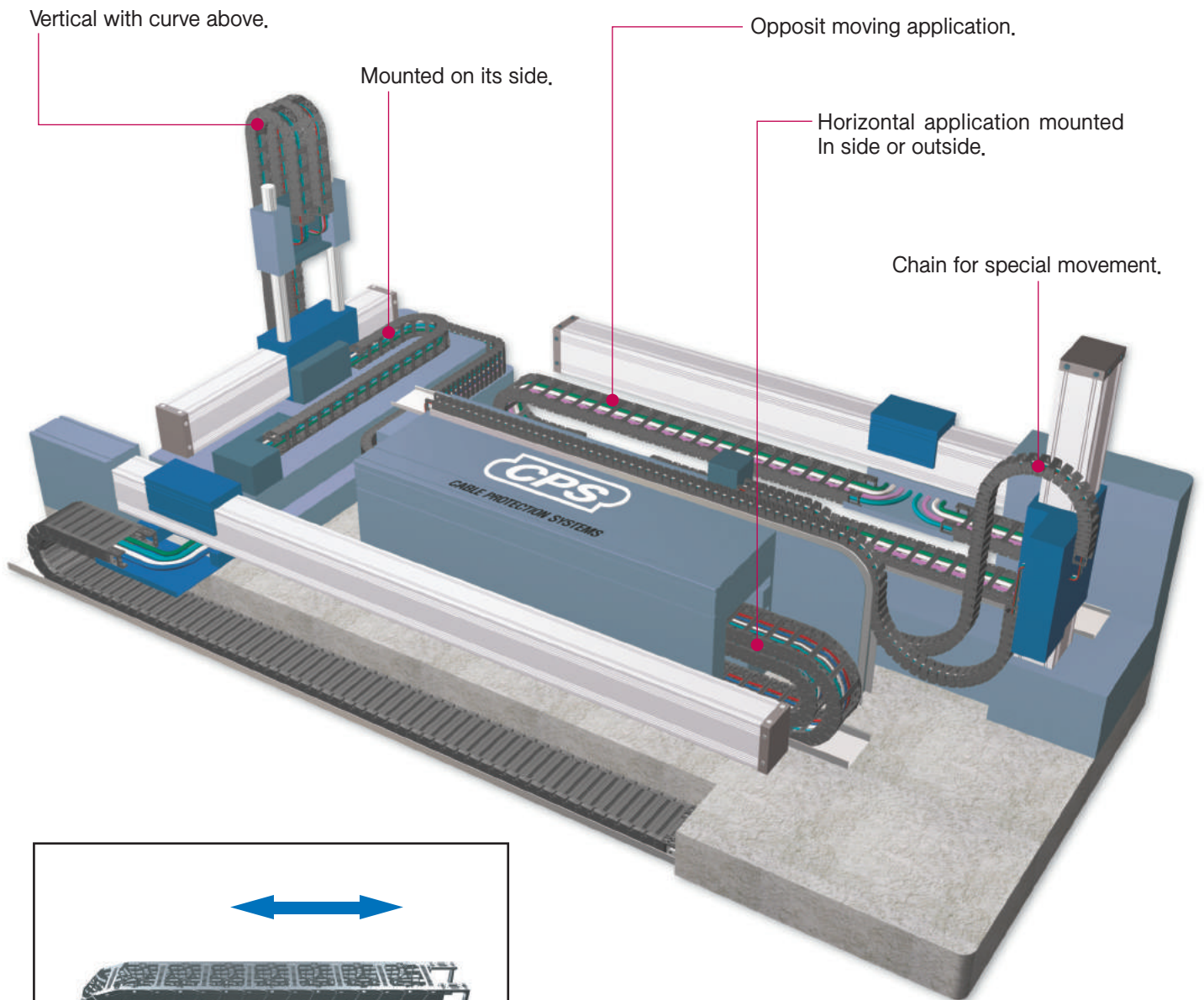


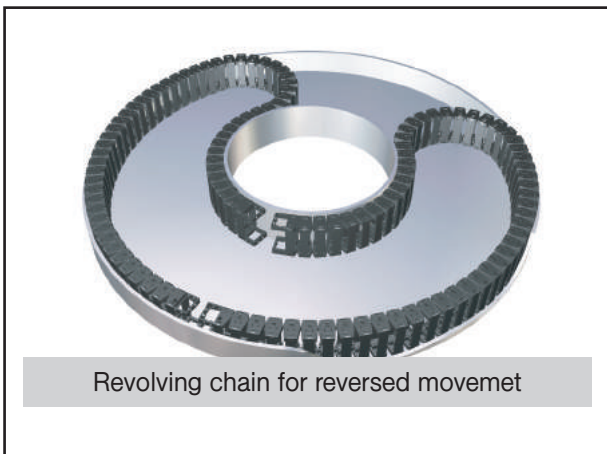
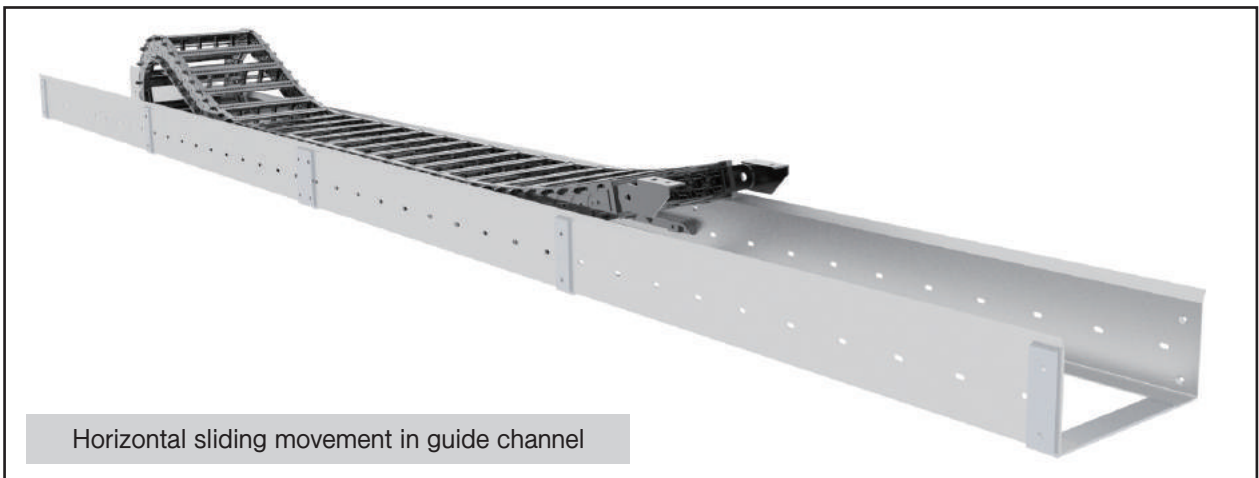
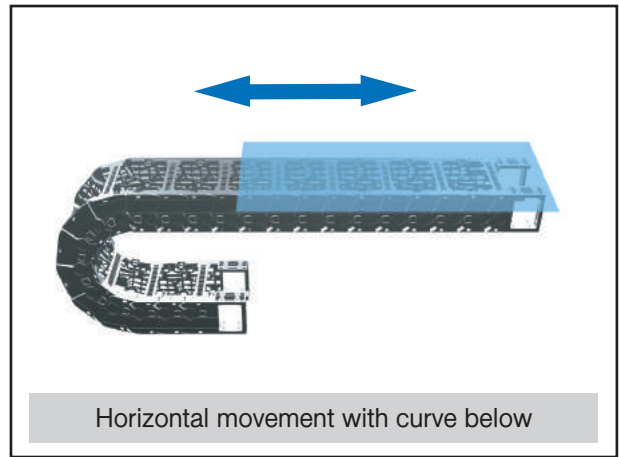
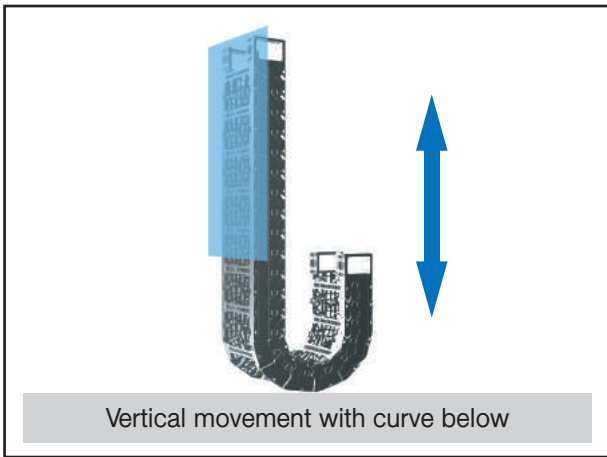
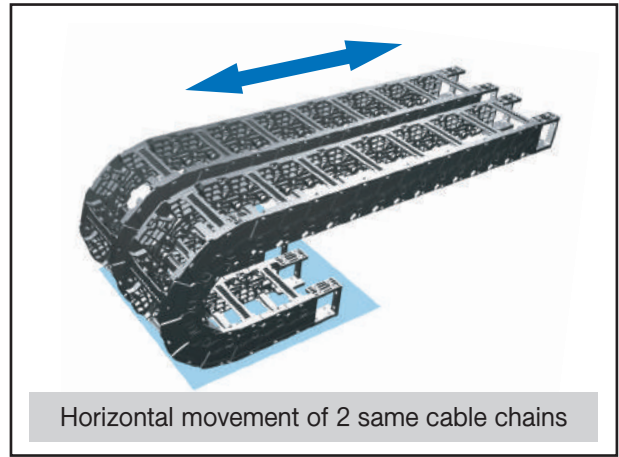
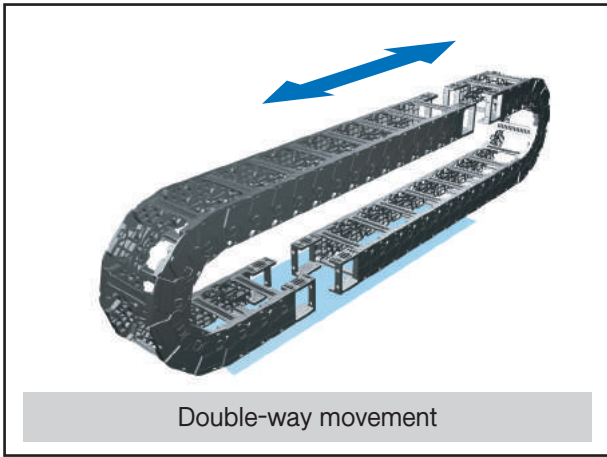
Basic Moving Arm



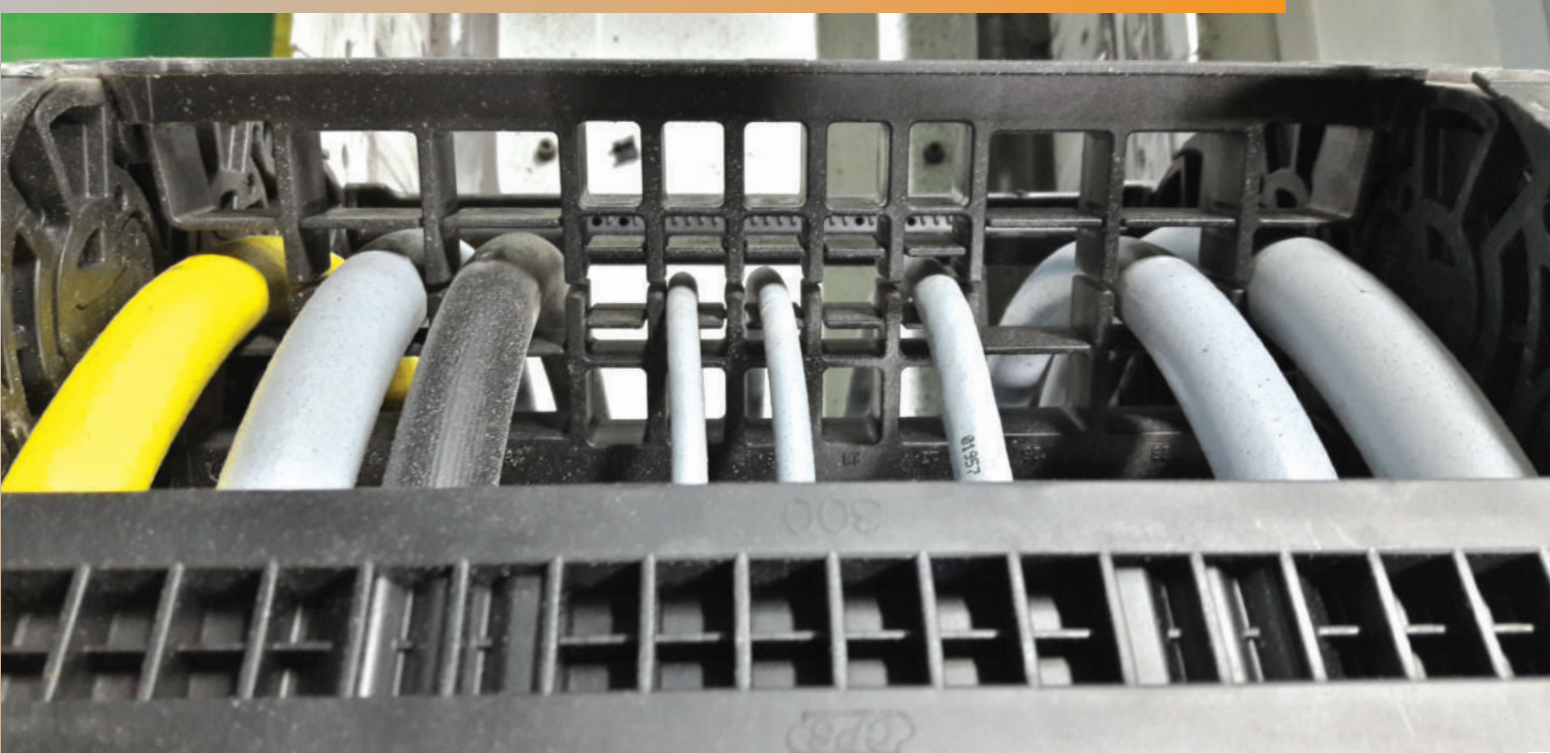
Basic Moving Bracket

Diverse application according to moving direction





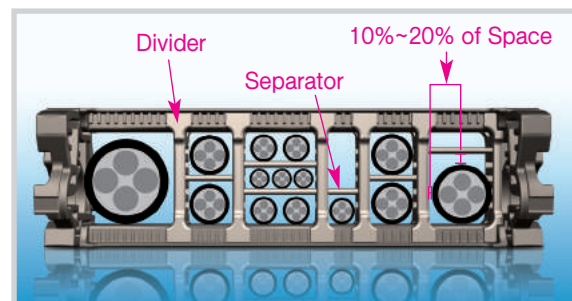
How to install cable chain with cables



Main purpose of cable chain is to protect cables and prolong cable's lifetime. To make sure, there are several standard guidance for arranging space between cables, cable layout and tension.

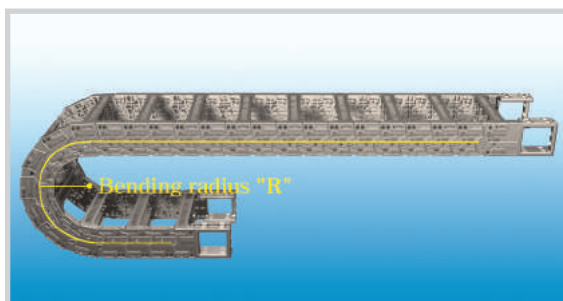
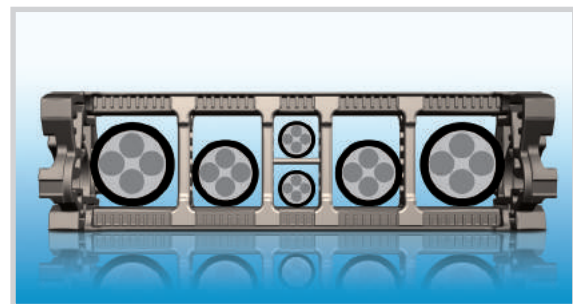
• Cable Space Standard

Round Cable	10% available space
Flat Cable	10% available space
Hose(Including Hydraulic Hose)	20% available space



• Cable Layout Standard

- When installing cables, the biggest cables or hoses should be laid at the side and the smallest cables should be laid in the middle to keep balance of weight during operation.





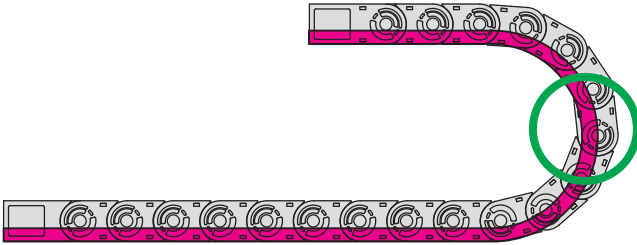

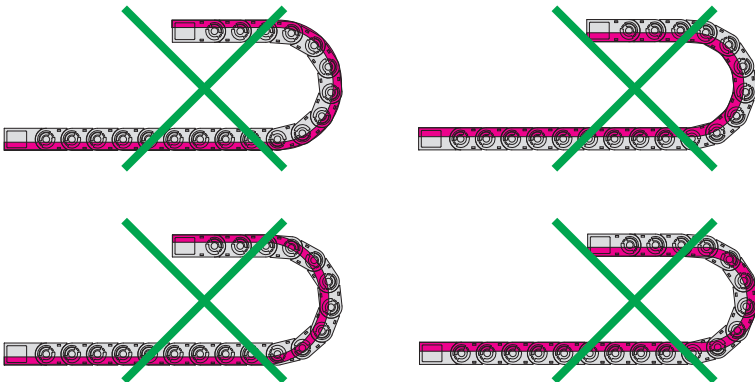

"R" min > 8 ~ 10 X Cable outer diameter

"R" min > 15 ~ 20 X Hydraulic Hose outer diameter



• **Standard of Cable Tension**

- Cables should be located as below at bent side of cable chain during operation.

<p>Correct arrangement of cables</p>	<p>  Cable chain  Cable </p>		 <p>Located in the middle between upper-frame and lower-frame : OK</p>
<p>Wrong arrangement of cables</p>		 <p>There's interference with frame due to short length of cables : NG</p>	

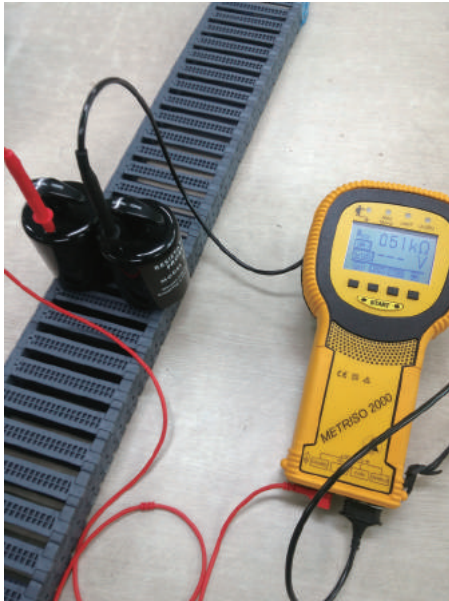
• **To prevent twisted error when inserting cables**

- Users or installers should use cable winding machine or equipment.
- Unfold and lay cables on the floor for 1 or half-day.



Technical sheet

- ESD & ATEX



- ESD Cable Chain

- CPS' cable chain can be produced ESD cable chain for special circumstance. ESD cable chain passed at least 2 millions reliability test and CPS is supplying ESD product for long time.

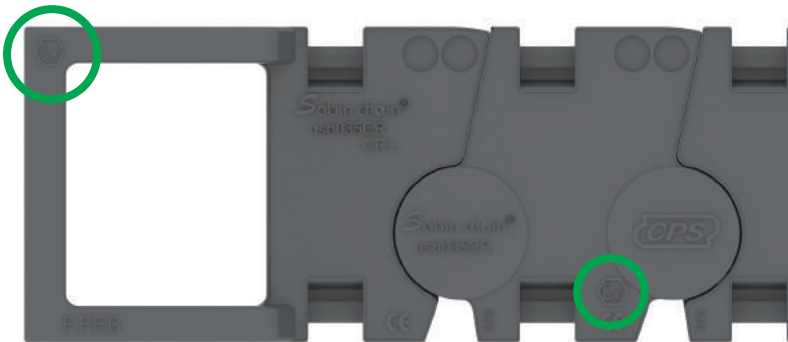
※ If requested, we can produce other models as well.

ESD Cable Chain Stock Status

CPS mini Chain	
CPS030	○
CPS033	○
Sabin Chain	
nsb020CR	○
nsb022CR	○
nsb028CR	○
nsb035CR	○

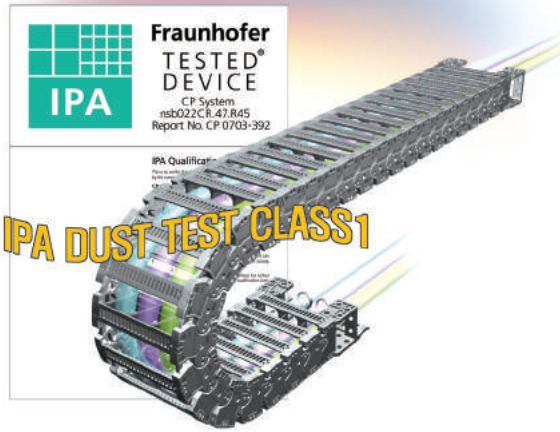
- ATEX

- CPS' cable chain obtained ATEX certificate from TUV Nord based on ATEX Directive 2014/4/34/EC. And it meets the Ex II 2 GD grade.



- Cleanroom & Customized

● LOW DUST CHAIN WITH MOST SUITABLE FOR CLEANROOM AREA!

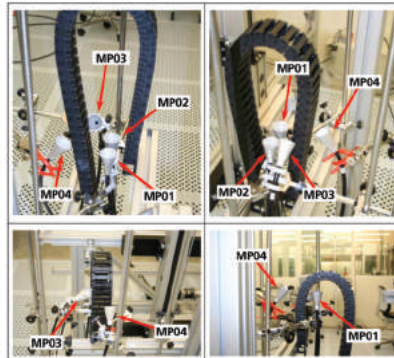
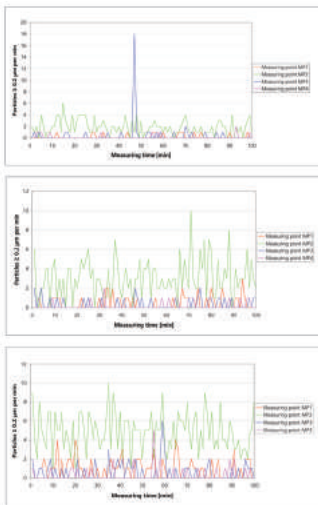


Sabin Chain was given ISO CLASS1 clean room certification according to the Germany IPA Dust Collection Test (VDI 2083 CLASS 1 / DIN EN 14644-1 ISO CLASS 1) thereby surpassing the allowable standard of Class 1 and easily qualifying it for use in semiconductor production lines on automation machine tools and machines requiring quiet and quick applications.

※ This test was done by the IPA TEST CENTER for the semiconductor manufacturer equipment and measurement processed with CLASS1 CLEAN ROOM(US Federal Standard 209E)

▶ IPA Test result

- nsb 020CR.20.R48 : ISO Class1
- nsb 045CR.75.R75 : ISO Class1
- nsb 035CR.55.R75 : ISO Class2



■ Clean room environment

- Air speed(0.45 m/s)
- Temperature(+5°C)
- Humidity (45%)

■ Test equipment

Fraunhofer IPA Test machine

■ Measurement Skill

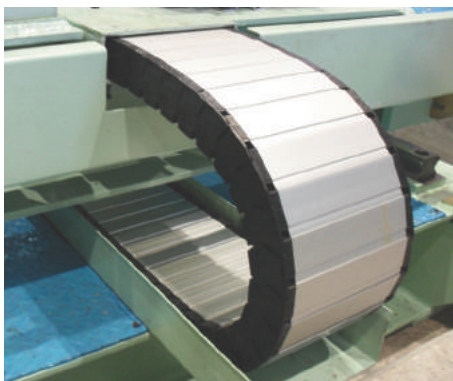
Checking the dust dimension of $>0.2\mu\text{m}$, $>0.3\mu\text{m}$, $>0.5\mu\text{m}$, use LPSA210 TYPE machine made by PMS.

■ Test operation and analysis

Operated by the guideline of VDI 2083 Part8

● Customized Production

- CPS can produce UV Cable chain and Various colors' cable chain for long time.



nsb035N

- ▶ **Application**
Display production line
- ▶ **Location**
Korea (L-Display)
- ▶ **Remark**
Aluminum Frame Cover



nsb035N

- ▶ **Application**
PCTC Ship
- ▶ **Location**
Korea (S-heavy industry)
- ▶ **Remark**
ESD / Orange color
- ▶ **Stroke**
2.5meters