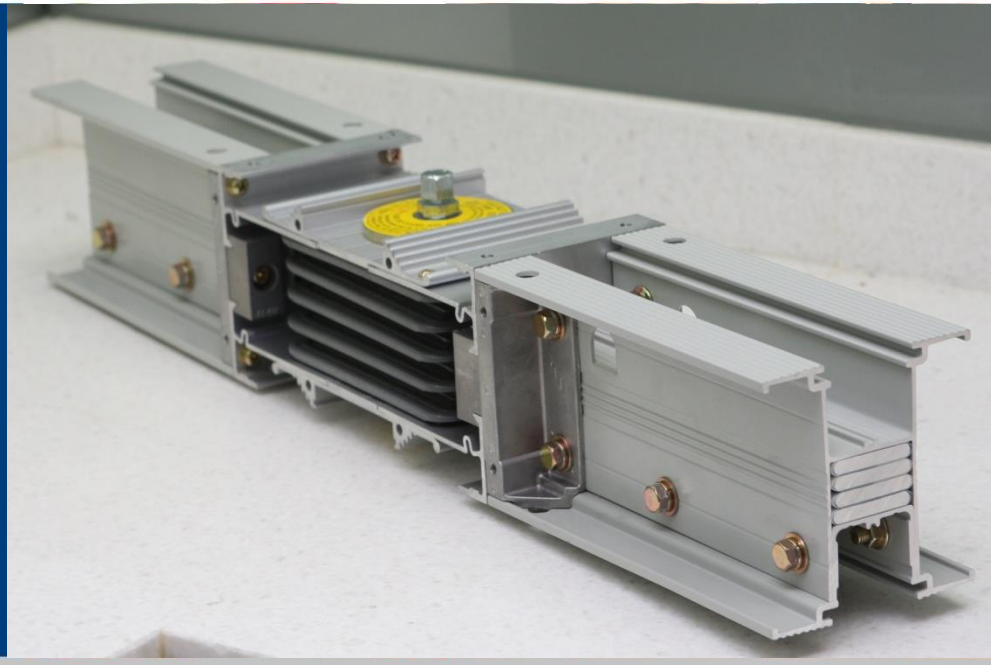
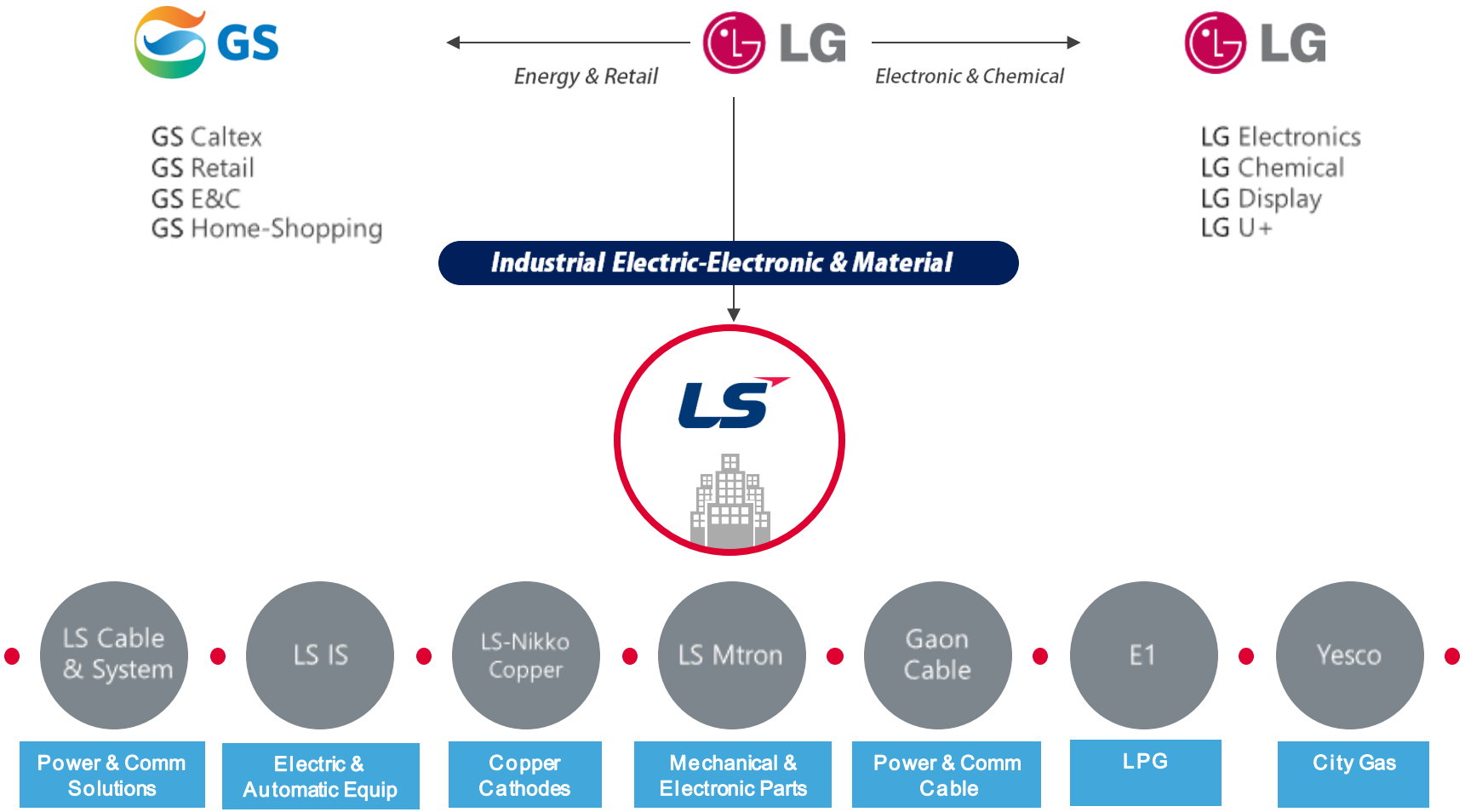
LS Cable & System

Enable the Cabled World

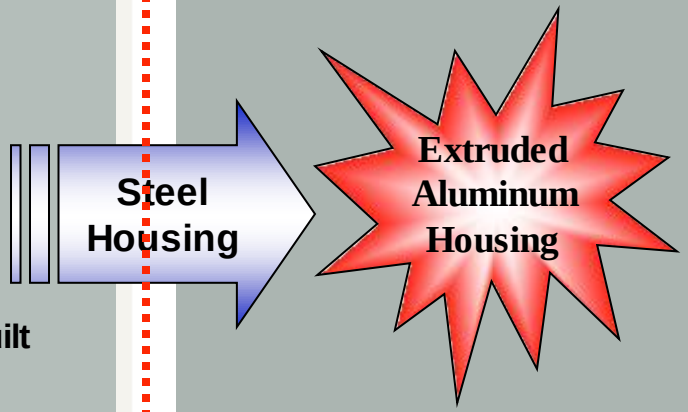
Busduct Business Group



- **LS spun off from LG in 2003 as a group specializing in electronics, electrical systems, energy and materials**

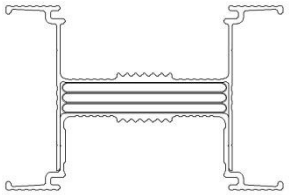


1983 ~ 2000	2000 ~ 2005	2006 ~
1983 : Technology collaboration with Hitachi Cable, Japan. 1984 : 600V Insulated busduct 1987 : 600V Mini busduct 1990 : 600V IP54 busduct 1995 : 600V IP65 busduct 1996 : 6.6Kv HV busduct 1999 : IP800 Type busduct	2000 : 600V F/R busduct 2000 : 600V Air Insulated busduct 2001 : 600V 5W busduct 2003 : 600V IP800 busduct 2003 : Plug-In unit interlock 2004 : Wuxi, China factory Built	2006 : Ez & Ef - Way 2007 : Ex – Way, Mini-Way 2008 : CoA-LV/MV (New NSPB) 2010 : SIB, IPB under developing
1985 : KERI certificate 1986 : KETI certificate	2002 & 2005 : ASTA Renewed 2003 : CCC Certified 2005 : GOST/Russia Certified	UL/ASTA/KEMA/CE/ Seismic Zone4/Electric Safety/ Green Environment (Eco-Friendly)
Iraq, Siemens, Taiwan, UK, Malaysia, Mexico, China, Poland, Indonesia, HK, Domestic	Siemens, Taiwan, Qatar, Thailand, Kuwait China, KWT, Iran, Indonesia, Domestic	Global Player In Asia, Middle East, Europe, USA



Global Product Scope

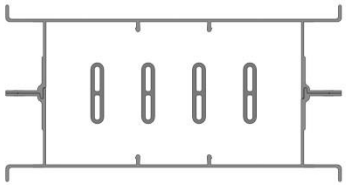
Power



IX / IZ / IF-way

Sandwich type
630A-6300A
Below 1000 VAC

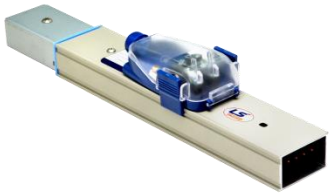
Datacenter

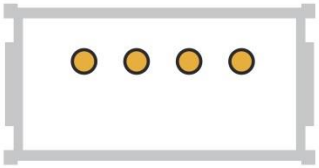


Mini-way

Air insulation type
160A-400A
Below 1000 VAC

Lighting





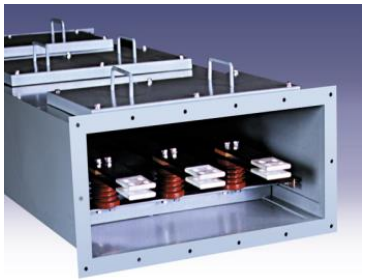
LT-way

Lighting Busduct
25A-63A
Below 690 VAC

Global Product Scope

Oil & Gas

MV



LV

Marine/Vessel

CR LV/MV

Cast resin type
630A-7500A (AL up to 6300A)
LV: Below 1000VAC
MV: up to 24kVAC

NSPB LV/MV

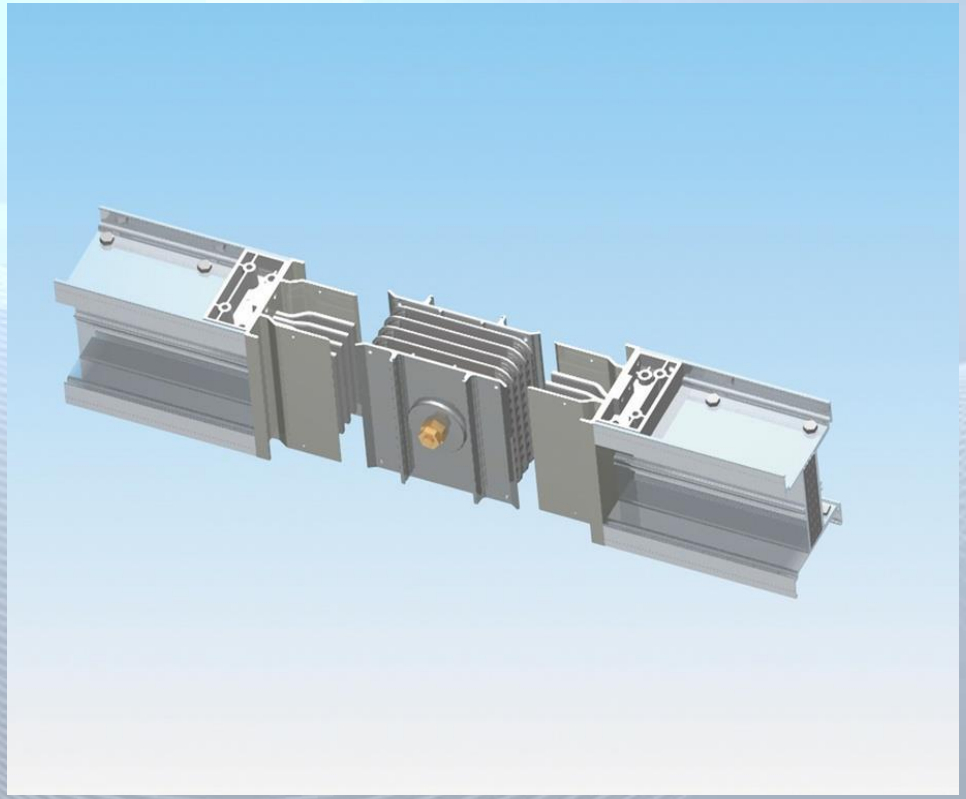
Non-segregated type
630A-4000A
LV: Below 1000VAC
MV: up to 24kVAC

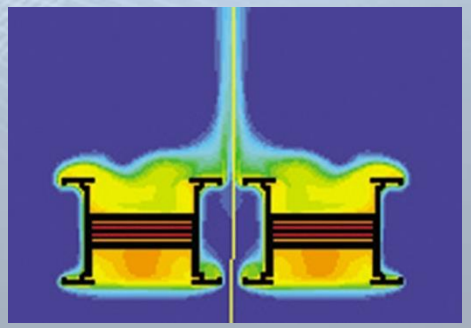
MS-way

Hybrid type (Sandwich+Air insulation)
1000A-5000A
LV: Below 1000VAC
MV: up to 24kVAC

LSC's Global Standard Busway System

E-Series





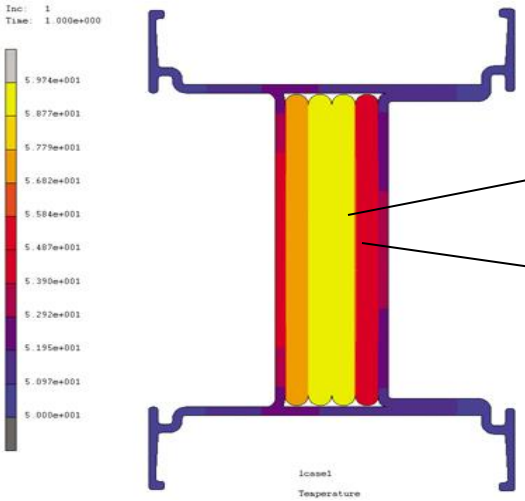
BUS DUCT BUSINESS TEAM

Key Attributes

- Available in Aluminum or Copper
- Conductivity levels of greater than 99% (Cu) and 61% (Al)
- Contact areas can be either tin or silver plated
- Current capabilities up to 6000A for both Cu and Al
- Up to 200% Neutral available
- Fluidized bed epoxy coating provides Class B (130°C) insulation. Superior to film and spray-on epoxy.

Key Attributes

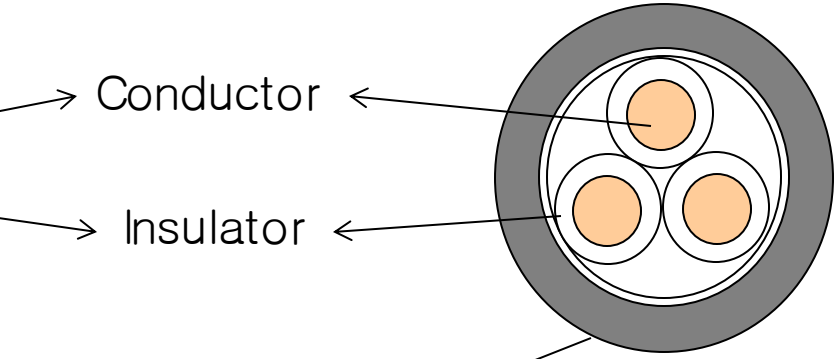
- Two-piece extruded aluminum housing
- Housing provides integrated ground conductor
- Internal ground of 50% or 100% available
- Standard IP 54 rating, up to IP65/66
- UL Certified
- Competitive pricing
- Fantastic lead time – 10 weeks to jobsite



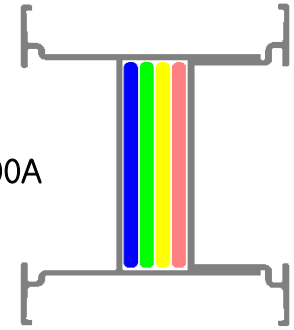
Conductor

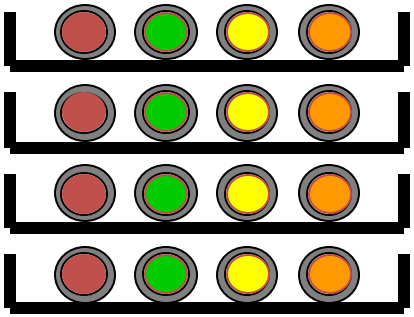
Insulator

Housing/Sheath



CU 3P4W 2000A





F-CV 300SQ 4X4 = 16 Cables

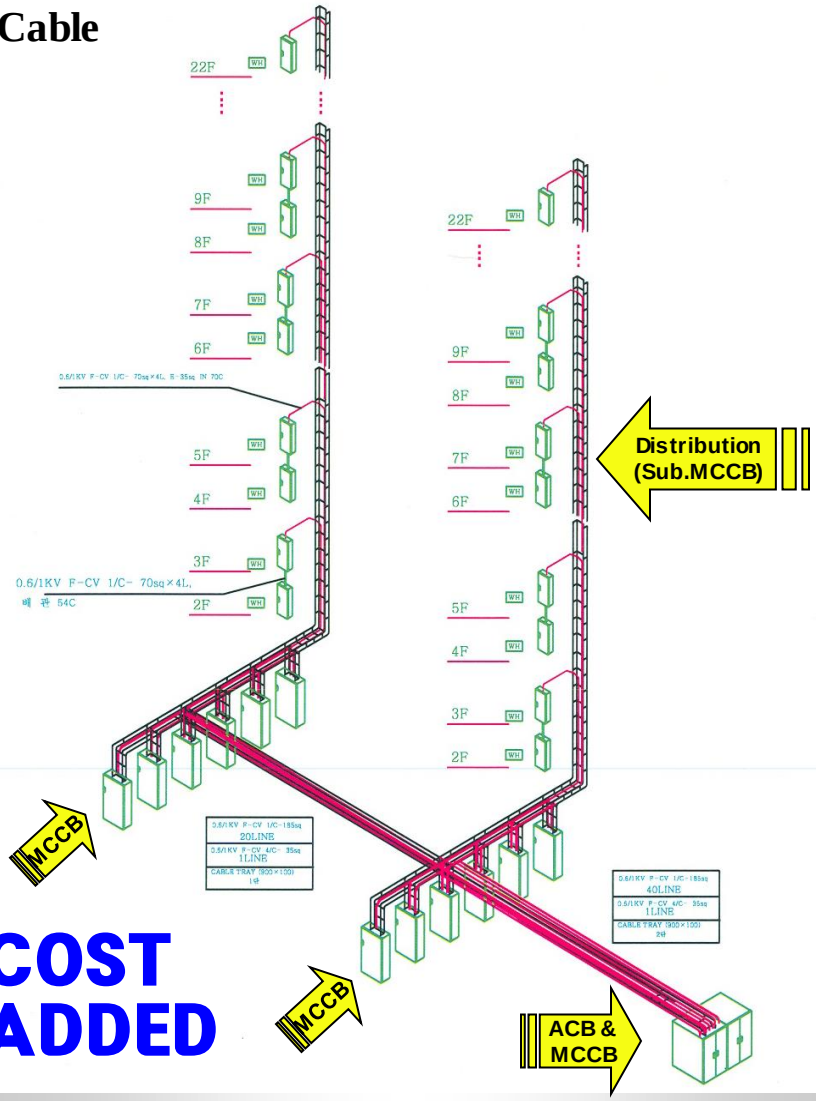
F-CV 150SQ 4X10 = 40 Cables

F-CV 95SQ 4X25 = 100 Cables

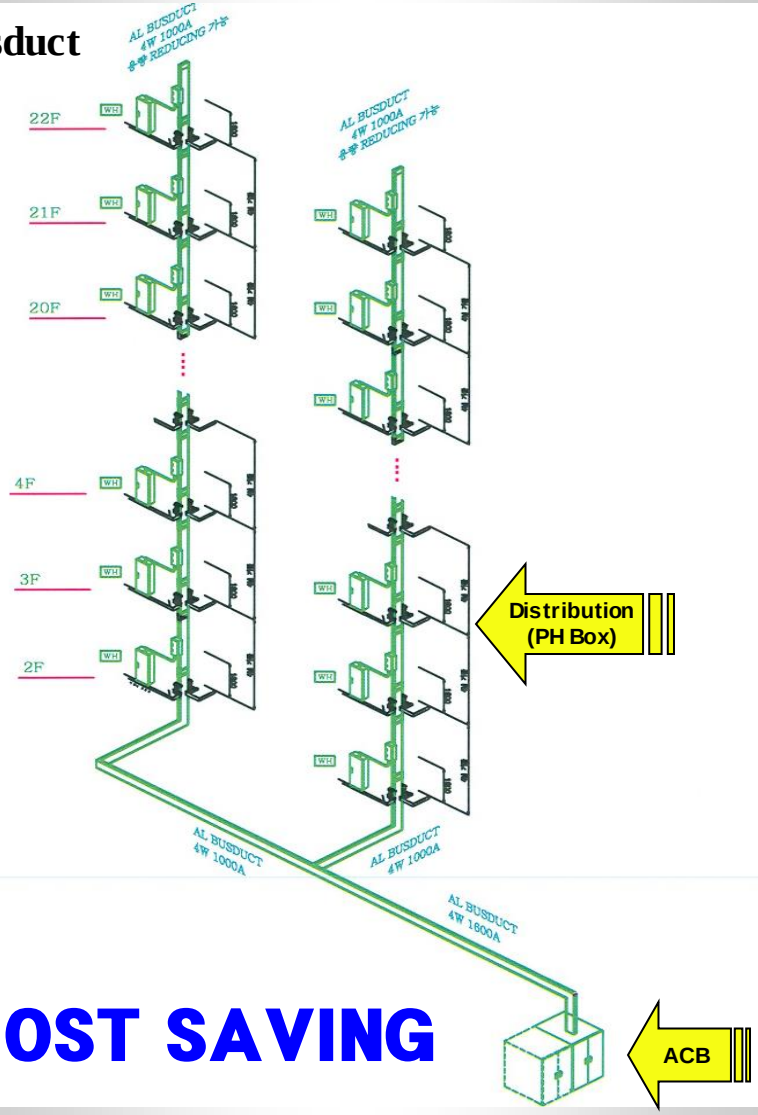
F-CV 70SQ 4X40 = 160 Cables

Power Distribution

Cable



Busduct



LSC's E-Series has same objects and functions with Power Cable System in delivering electricity, but has the following characteristics …

Technically

- Massive Power Transmission
- Low Voltage Drop
- High Short Circuit Ratings
- Temperature Rise Stability
- Easy Installation by Jointing Kits
- Simple Line and Easy Branching

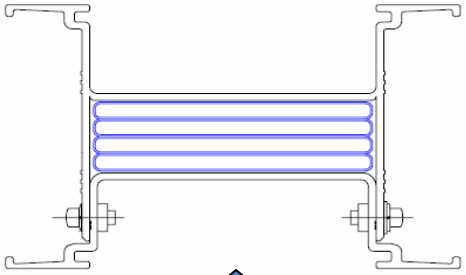
Economically

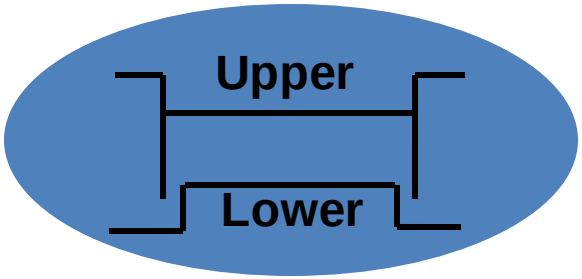
- Installation Labor Savings
- Smaller Space by compact size
- Easy Maintenance
- Easy Expansion and Easy Moving
- More Aesthetically Appealing

Specifications

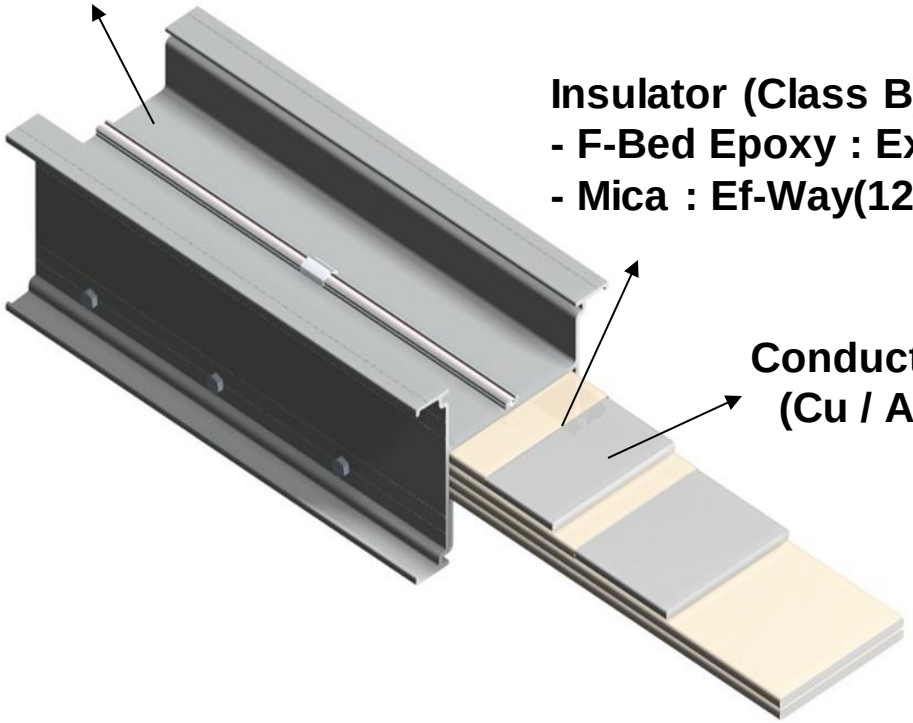
STANDARS	IEC 60439-1&2 Bus ways BSEN 60439 : Bus ways KS IEC 60439-1&2 : Bus ways ASTA, KEMA, CE, TUV(Green), IEEE(Seismic Zone 4), IECEx(Safety) , UL 857 Certified
SERVICE CONDITIONS	Ambient temperature : -30 ℃ ~ +55 ℃ Relative Humidity : 95% or below
AMPERE	630A ~ 6000A (7500A for CU)
BUS BAR	Tin-Plated at contact point (Silver plated available)
INSULATION	Class B (130 ℃) / Fluidized Bed Epoxy
HOUSING	Two Piece Extruded Aluminum Housing
IP DEGREE	IP54 Standard and up to IP66
GROUNDING	Integral Housing (100%), Internal Half Ground/Full Ground

Construction



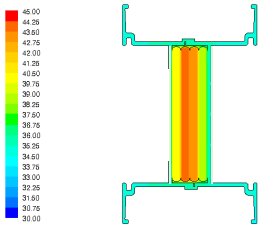


Two Pieces Extruded
Aluminum Housing

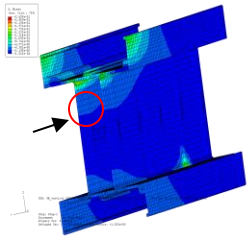


Insulator (Class B)
- F-Bed Epoxy : Ex-Way
- Mica : Ef-Way(1200℃)

Conductor
(Cu / Al)



CAE

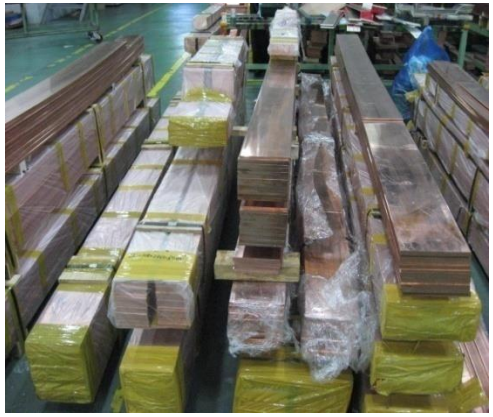
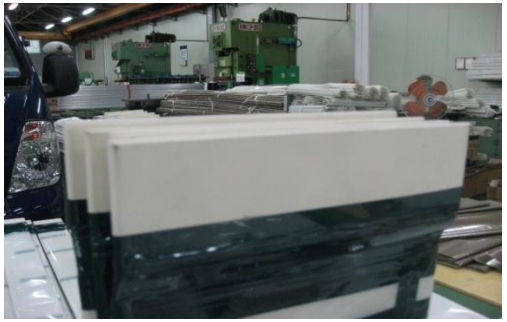


Temperature Analysis

Construction Analysis

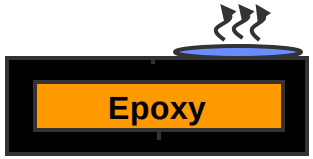
POWERFUL CONSTRUCTION

Busbar

	CU	AL
CONDUCTIVITY	99%	61%
PROCESS	ELECTRICAL	ELECTRICAL
PLATING	TIN	TIN
BUSBAR		
CONTACTING POINT		

Insulation

CLASS B(130℃) - FLUIDIZED BED EPOXY THICKNESS 0.5MM OVER (600um +/-100um) INSULATION UP TO 1000V



Water on epoxy insulator surface
-> evaporation

Penetration into PVC film
-> stays between conductor and insulator

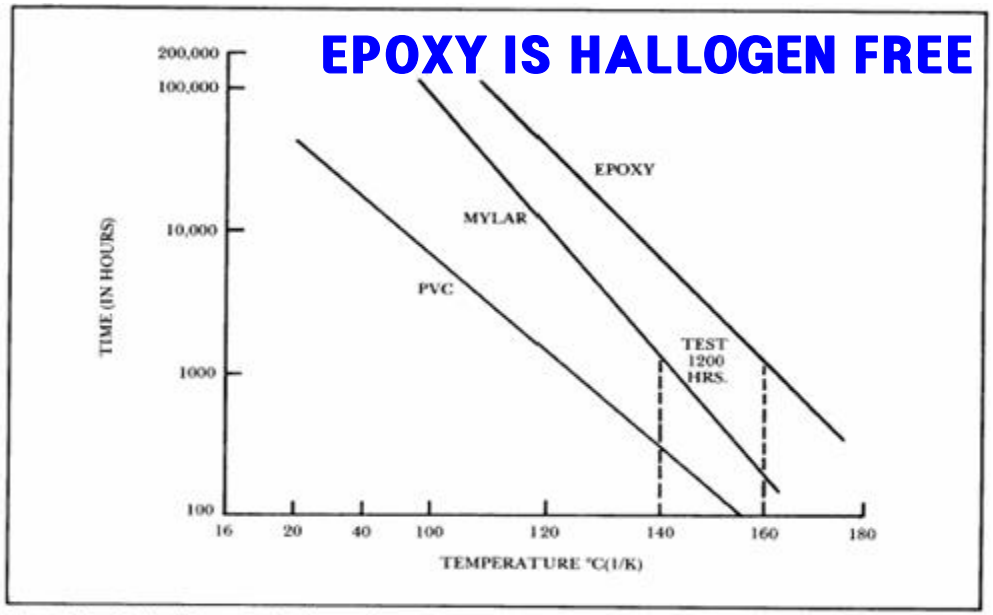


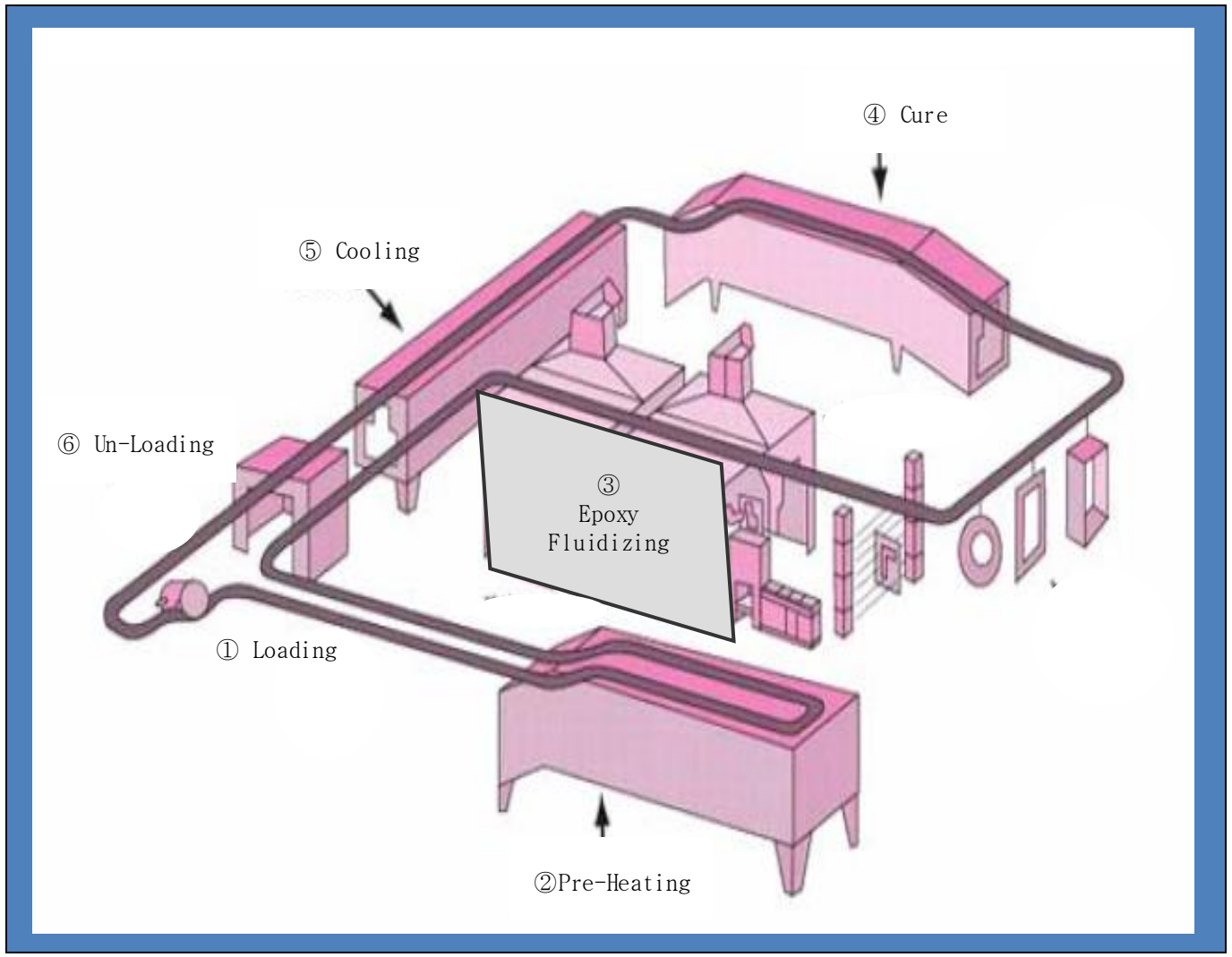
Figure 4. Insulation life curves plotted according to the Arrhenius reaction theory.

Spectra Series™ Technical Paper

Five days of 120 hours at 160°C with 150-percent (900-V) service voltage, and two-day exposure to relative humidity sufficient to cause moisture to collect on the buswav.

* Source : GE's F-Bed Epoxy Technical Data

Fluidized Epoxy Bed Process



Epoxy Factory

Hangering.avi

Epoxy.avi

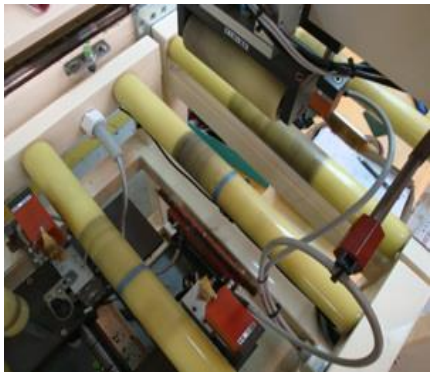
Curing.avi

Epoxy Pin Hole Test

PIN-HOLE TESTER

PIN-HOLE TESTER MONITOR

PIN-HOLE TESTER ROLLER



PIN-HOLE BRUSH

ALAM RAMP

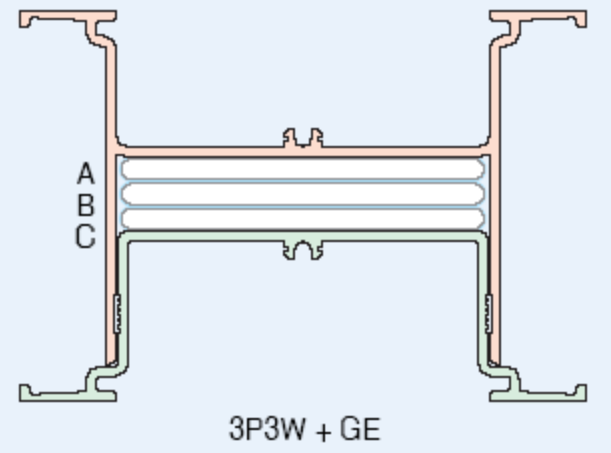
Epoxy Test Procedure

Pass.avi

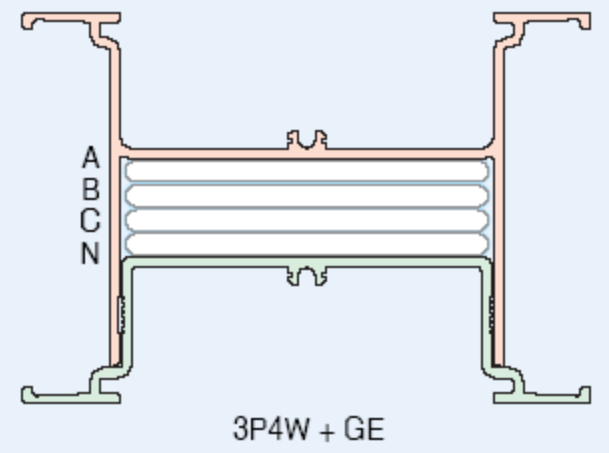
Failure.avi

Superior Housing Design

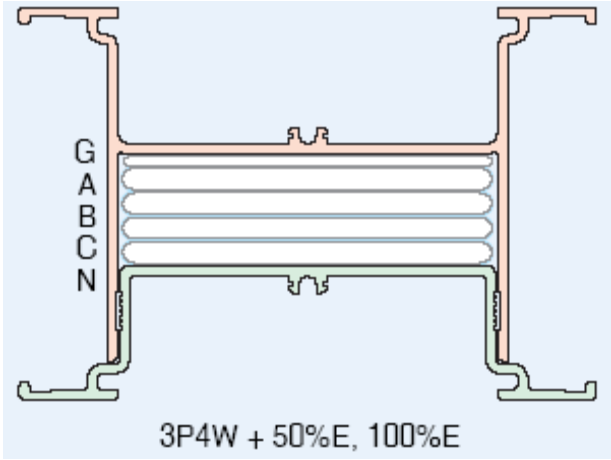
TWO PIECE EXTRUDED ALUMINUM HOUSING
POWERFUL GROUNDING CAPACITY



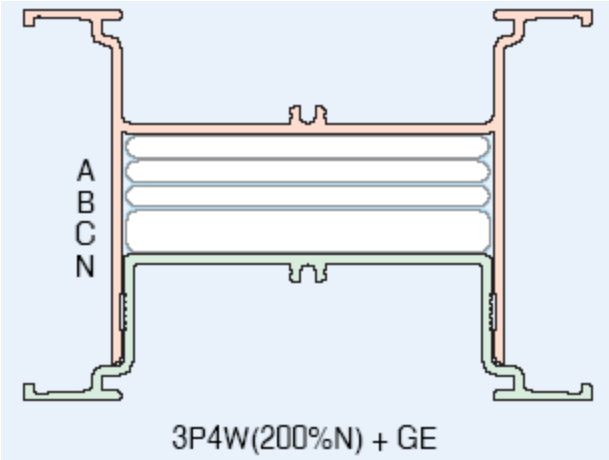
3P3W + GE



3P4W + GE

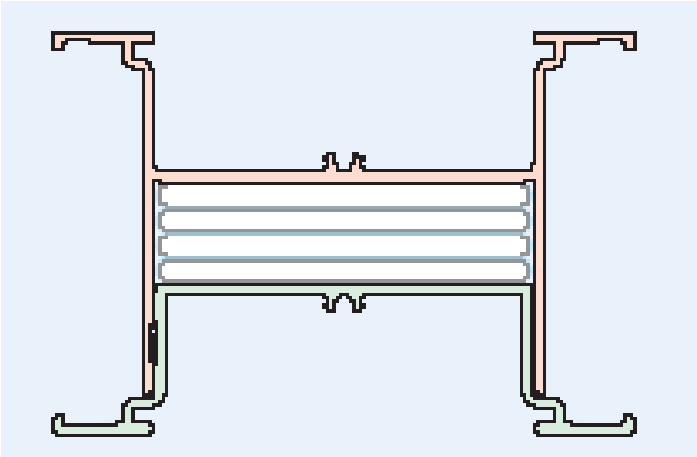


3P4W + 50%E, 100%E

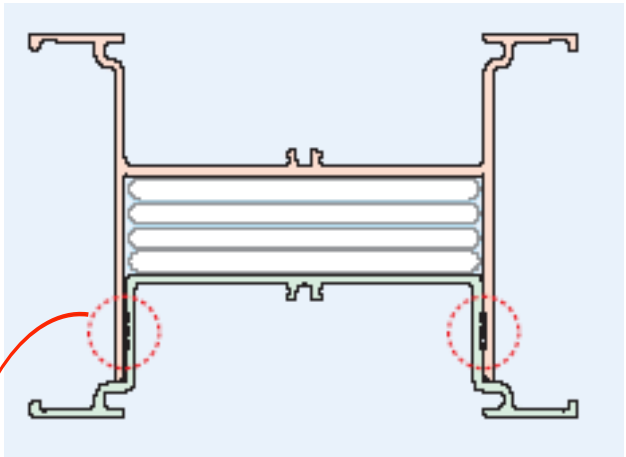


3P4W(200%N) + GE

IP54/55 IS STANDARD

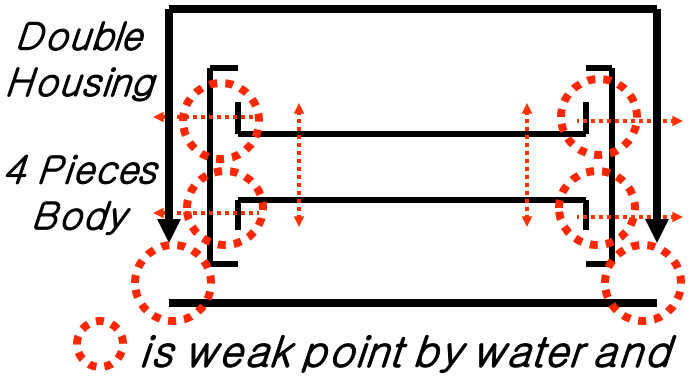


IP54/55

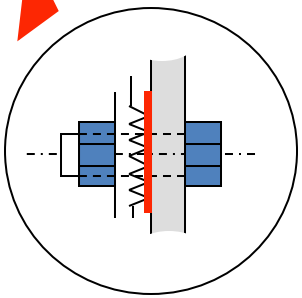


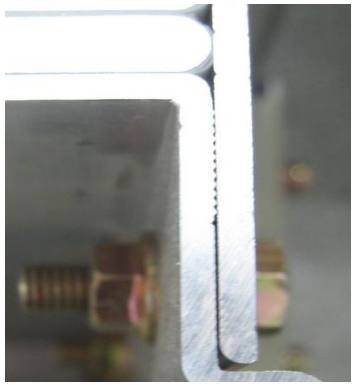
IP65/66
Sealant treatment

Other manufacturer's IP .....

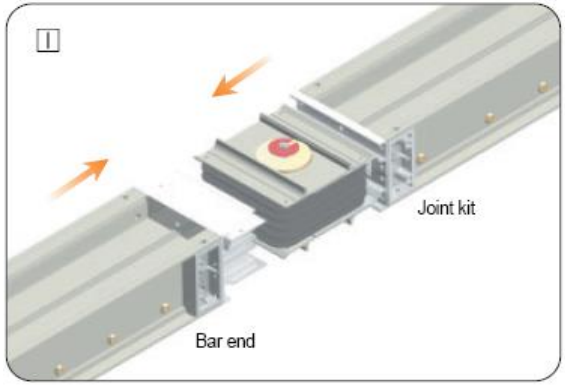


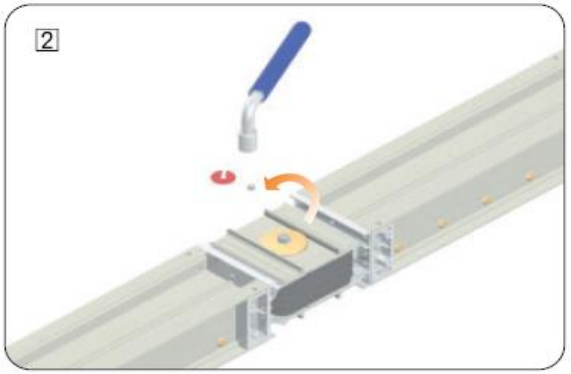
is weak point by water and
size is big due to double housing



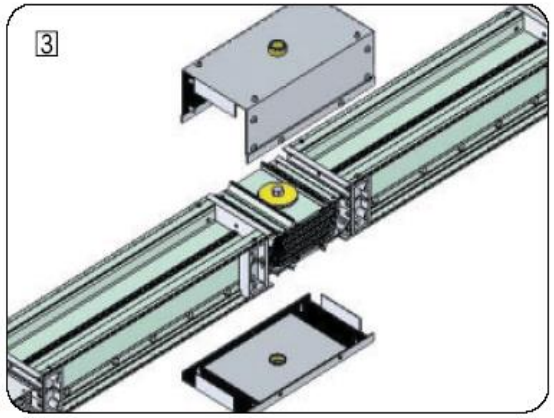


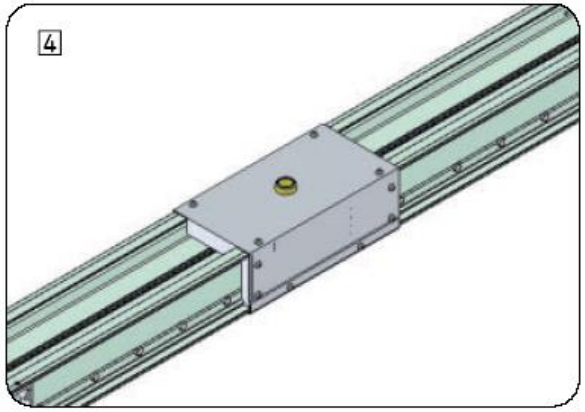
NO SPECIAL TOOLS REQUIRED





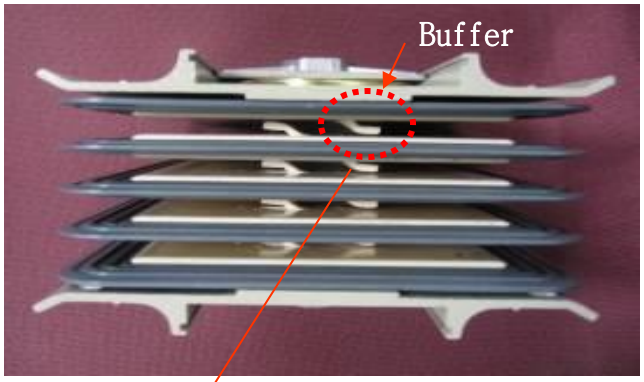
Check the contact surface has no damage and contamina
Inspect the busway run for straightness in all planes.
Insert the "bar ends" to joint kit slowly.

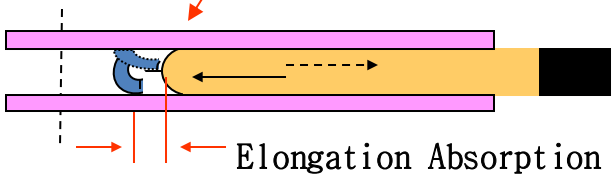




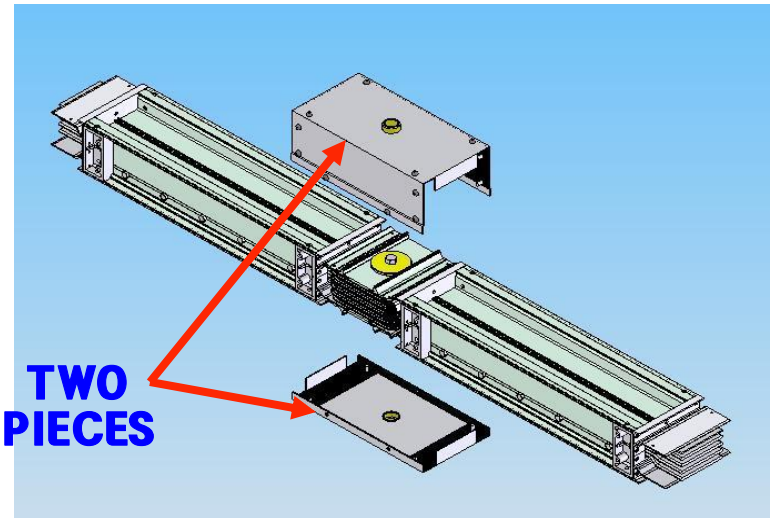
Jointing Kits and Joint Cover

Double-Headed Bolt



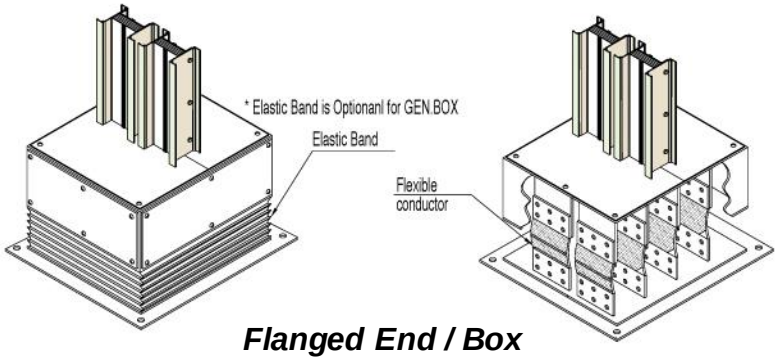


ELONGATION ABSORPTION

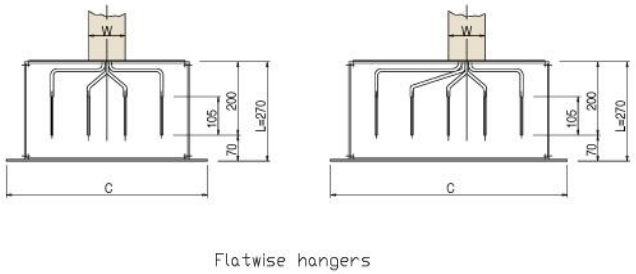


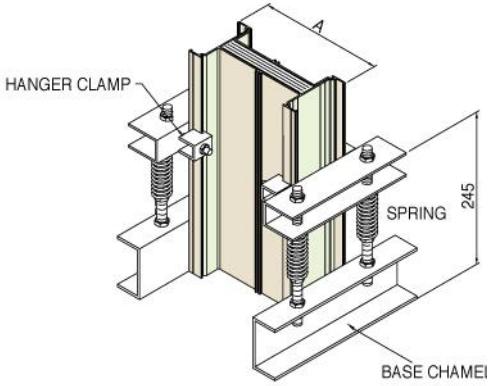
GASKETED JOINT COVER

Fittings

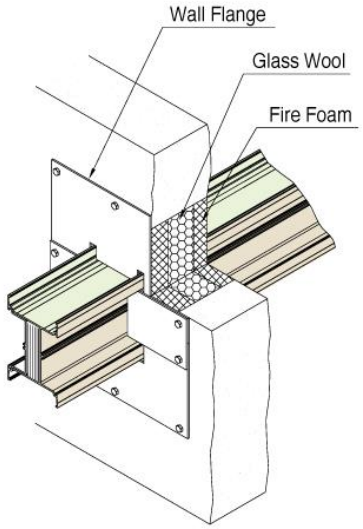


Flanged End / Box

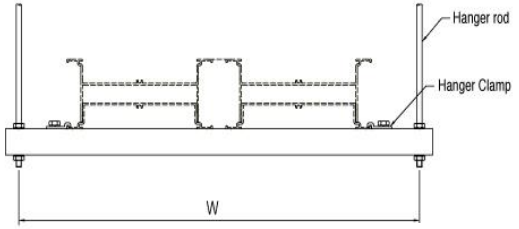


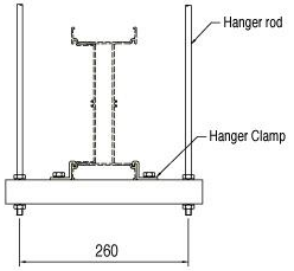


Vertical Hangers



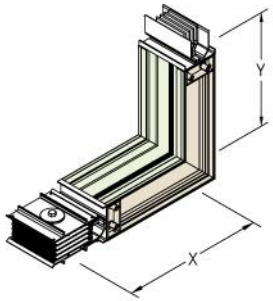
Wall / Floor Flange



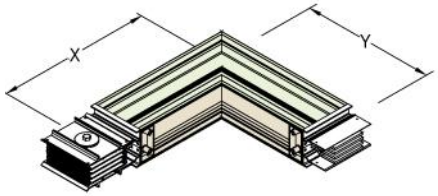


Horizontal Hangers

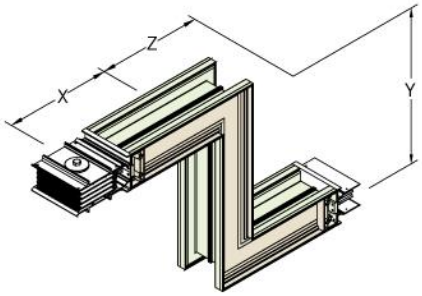
Fittings



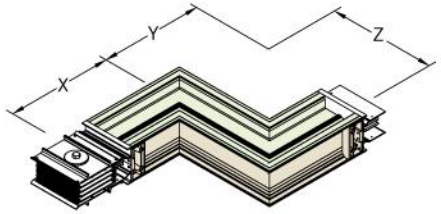
Horizontal Elbow



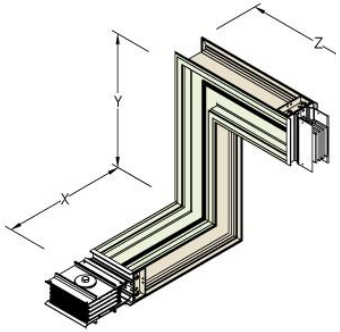
Vertical Elbow



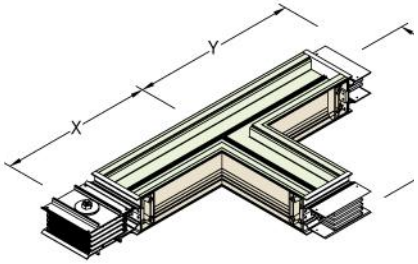
Horizontal Offset



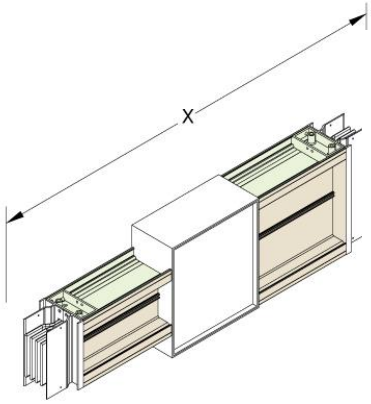
Vertical Offset



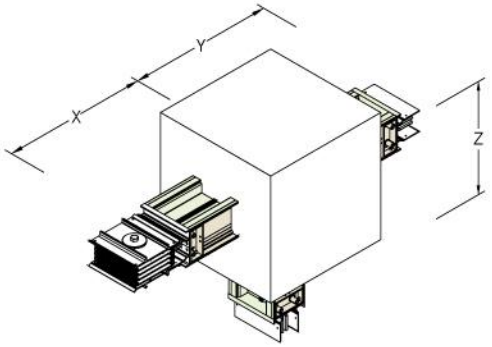
Combination Elbow



Tee



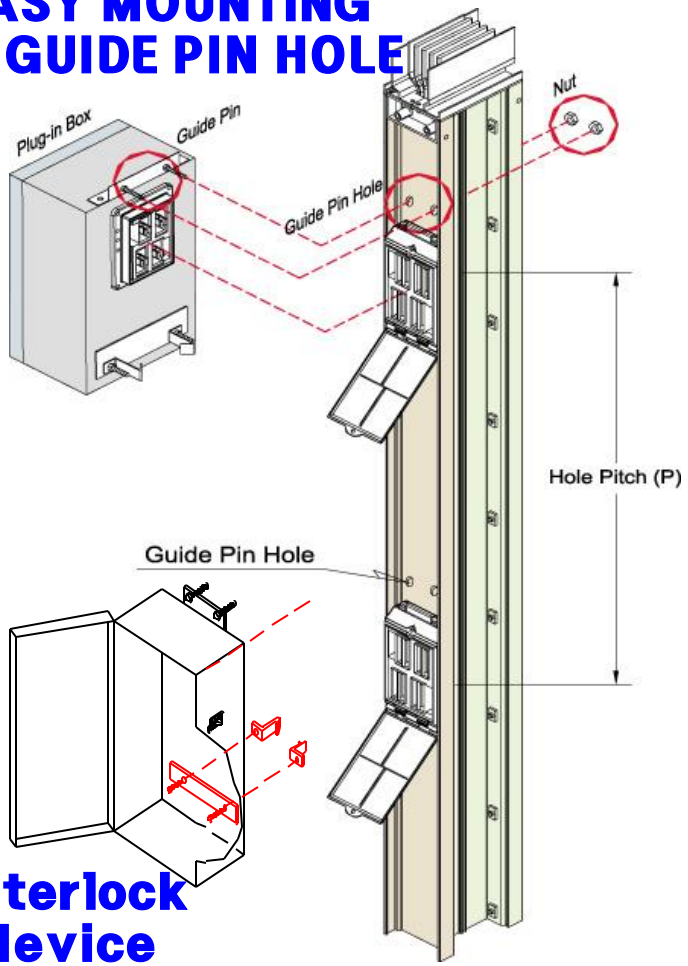
Reducer



Expansion (if needed)

Plug in Holes

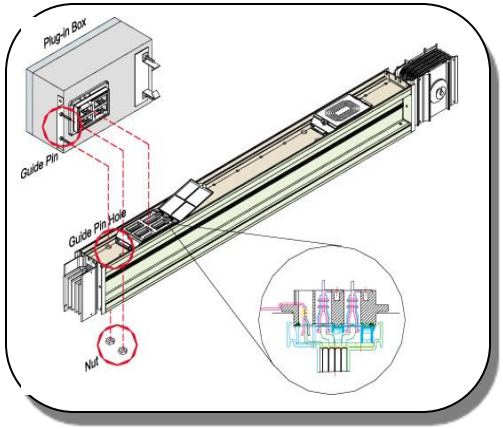
EASY MOUNTING BY GUIDE PIN HOLE



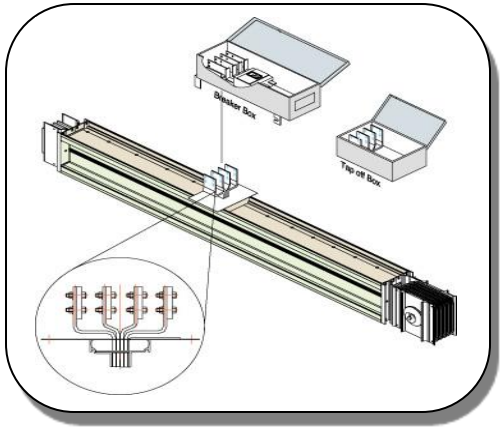
Interlock device

Standard 3 meters
5 Holes x 2 Sides

MCCB FRAME (AF)	"Minimun required Plug-in Hole Pitch (P)" (mm)
50, 60, 100	500
200	550
400	900
600, 800	1000
1000, 1200	1300

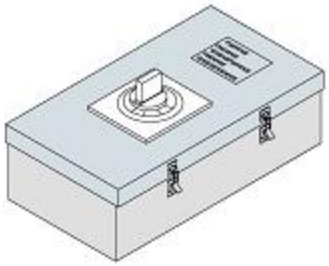


Plug in Hole upto 800A

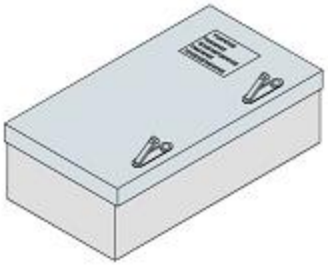


Tap off upto 1200A

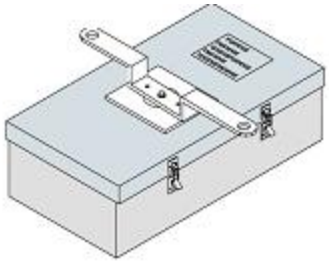
Plug in Boxes



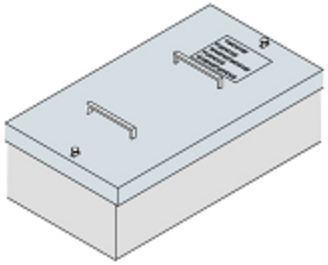
External handle



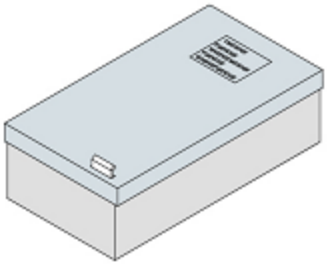
Push button



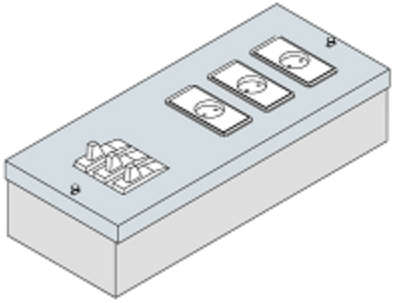
External lever



Bolt fastening



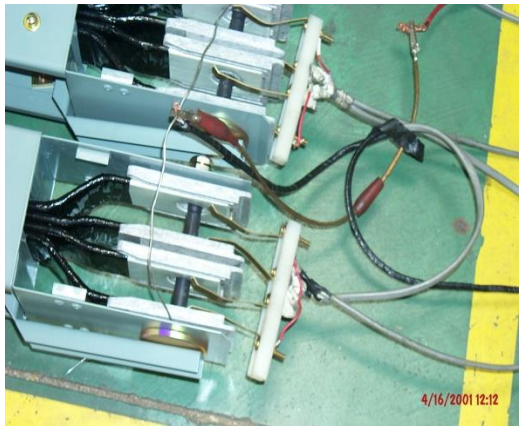
Button



Outlet

ASSEMBLY EQUIPMENT AUTOMATIVE (ONLY SCREW MANUALLY BY AIR HORSE)

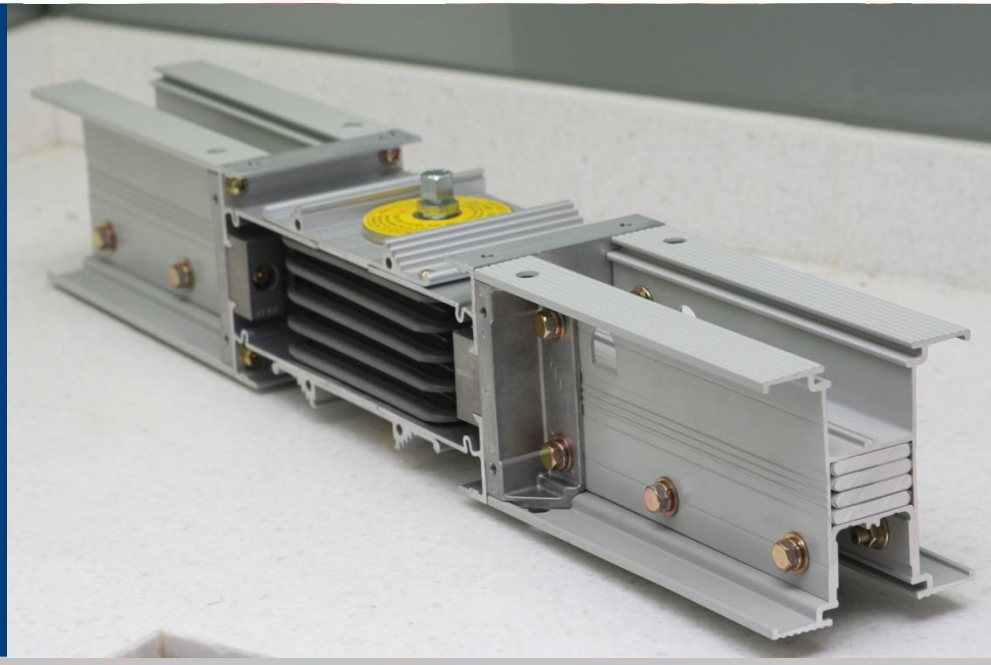
QUALITY ASSURANCE

Test	Conductor	Features	
Insulation resistance test	- Over 500MΩ - Measure by D.C. 500V insulation tester between each conductors and ducts - Sampling test		
Dielectric test	- A.C. 4000V / 1 Min - Measure with frequency 60/50 Hz AC between each conductors and ducts - Total inspection		

LS Cable & System

Enable the Cabled World

Busduct Business Group

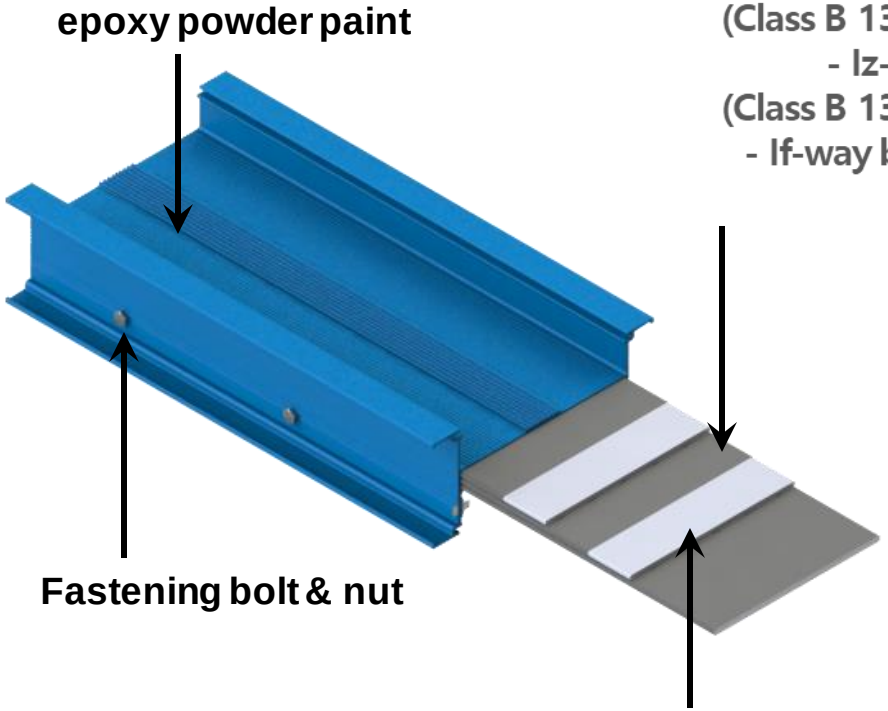


Construction

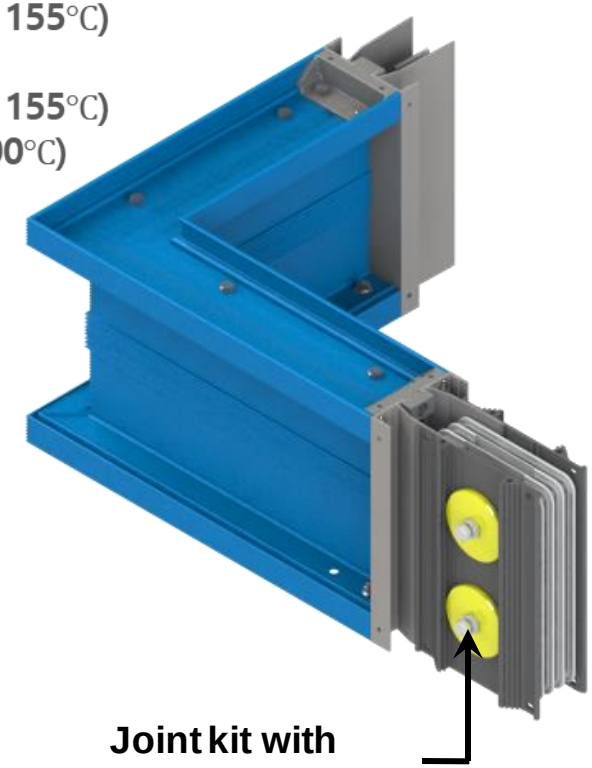
LS C&S I-series uses all-aluminum extruded housing for better dissipation and its higher conductivity allows excellent grounding capacity

Extruded aluminum housing coated with epoxy powder paint

Insulation
- Ix-way by Epoxy
(Class B 130℃ / Class F 155℃)
- Iz-way by Film
(Class B 130℃ / Class F 155℃)
- If-way by MICA (1200℃)



Fastening bolt & nut

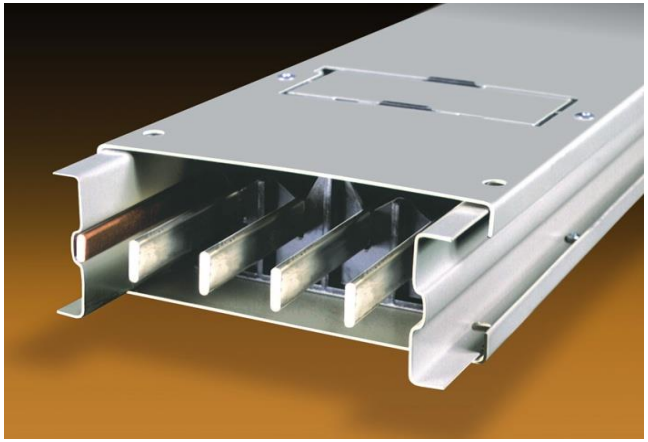


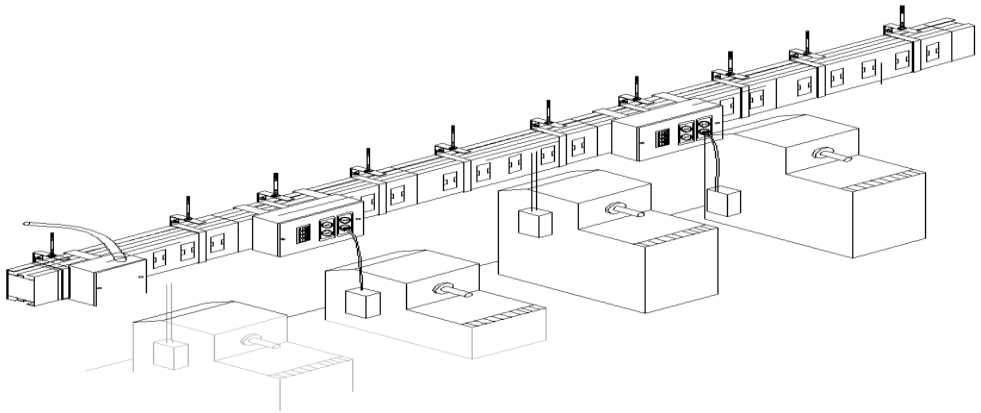
Conductor (Copper / Aluminum)

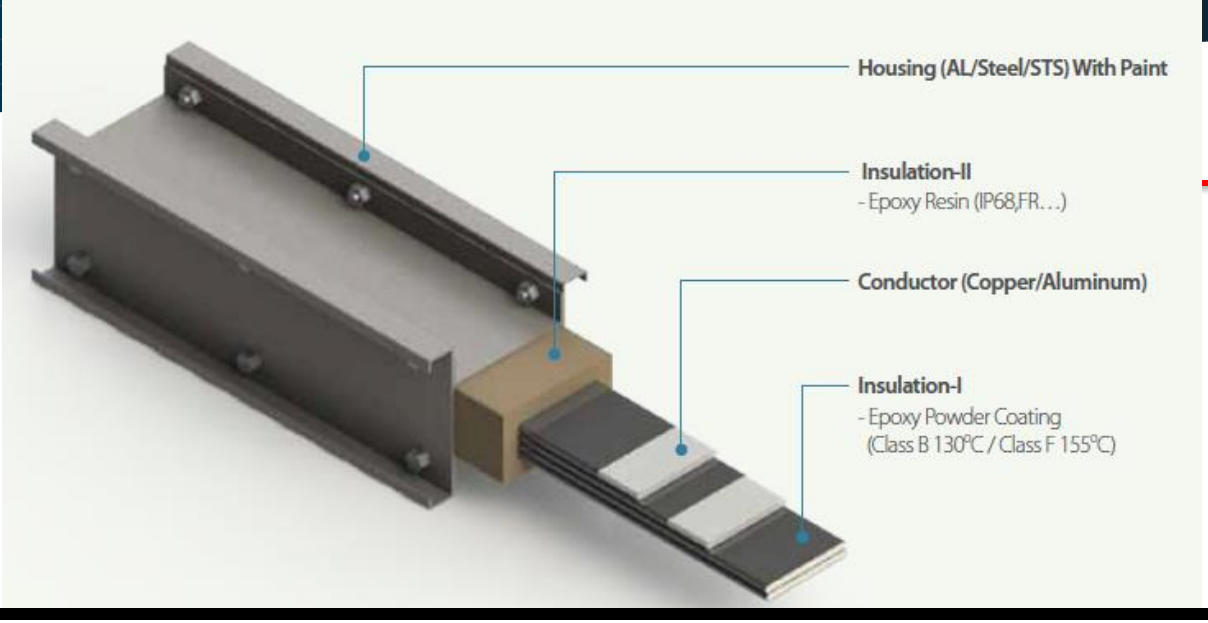
Joint kit with double head bolt

LSC's Mini-Way (Air Insulated)

Name	Conductor	Rated		Usage	Application
		Voltage	Ampere		
Baby Bus Duct	CU/AL	Below 600V (AC)	160A, 250A, 400A, 630A, 1000A,1250A	- Little capacity, assembly line etc - Indoor	Apartment Condominium Golf Club Shopping Mall
Features	- Put the branching hole at fixed distance in duct to insert Plug In device in order to easy branching				



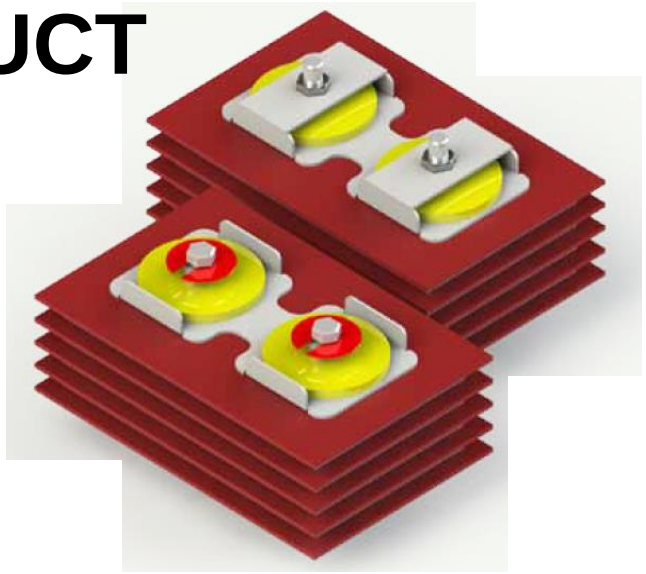




LS Cable & System
Leading Solution

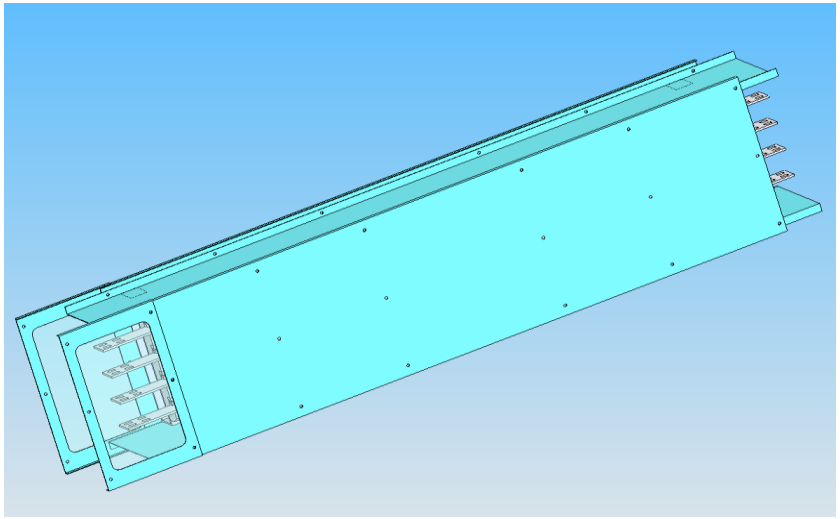
CR-WAY

LS CABLE & SYSTEM BUSDUCT
CR-WAY



LSC's NSPB-LV (Air Insulated)

Name	Conductor	Rated		Usage	Construction
		Voltage	Ampere		
Air Insulated Bare Bus Duct	Copper	Below 600V (AC)	600A ~ 4000A	- Factory and High Building consumed big volume - Indoor & Outdoor	Plant (Oil & Gas, FPSO) Wind Tower Marine
Features	- Fixing bare conductor with insulator in housing - Good short circuit rate - Used commonly as Air Insulated				



LSC's NSPB-MV (Air Insulated)

Name	Conductor	Rated		Usage	Construction
		Voltage	Ampere		
High Voltage Bus Duct	Copper	3.3KV ~ 36KV	600A ~ 5000A	- Medium voltage line, Sub – Station or Generator etc - Indoor & Outdoor	Plant (Oil & Gas, FPSO) Substation
Features	- Put the conductor into housing and fix with insulator - Fixing with epoxy for indoor, porcelain for outdoor - 3.3KV, 6.6KV, 13.8KV, 22KV, 36KV Grade