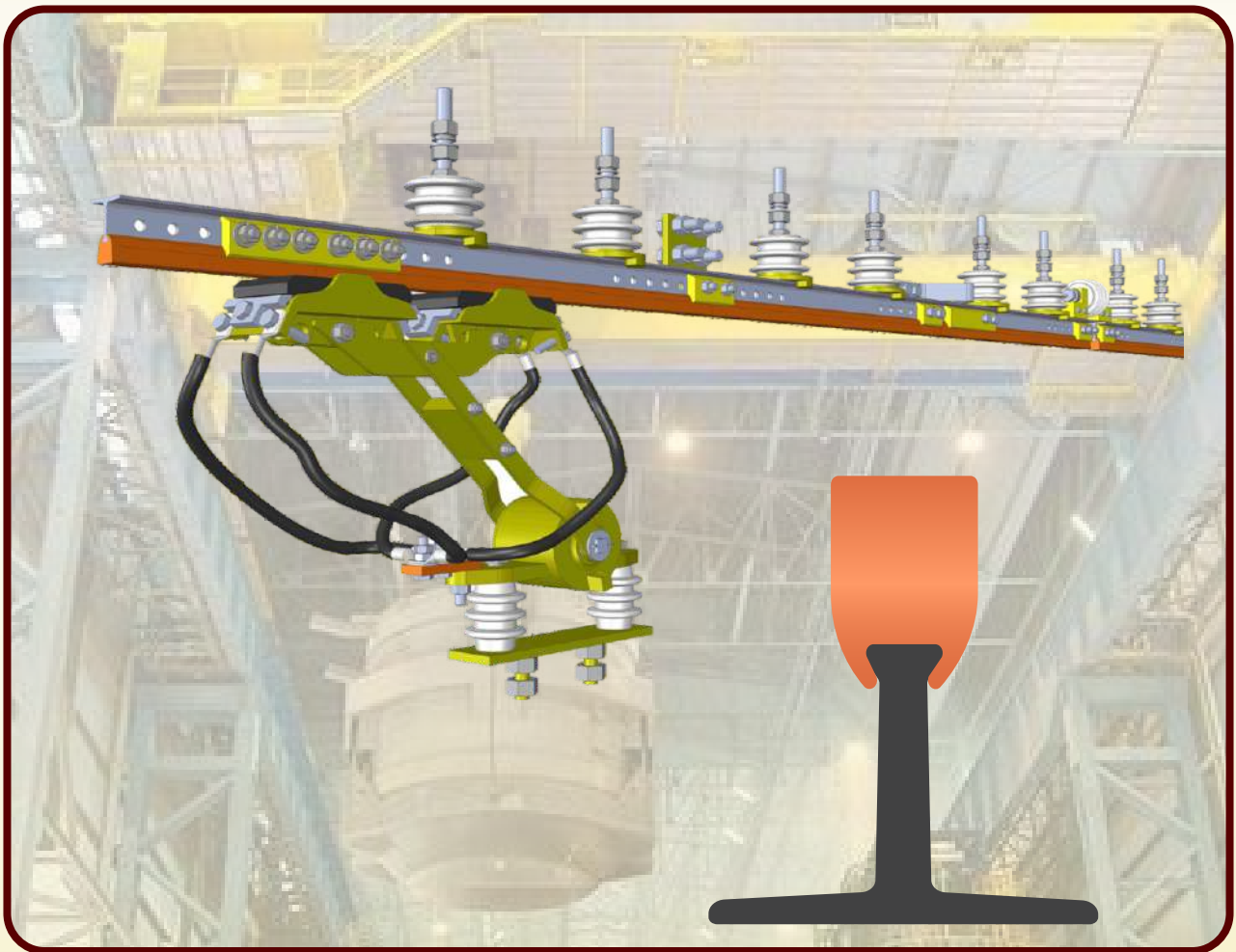


COPPERHEAD RAIL SYSTEM

03 12 2013

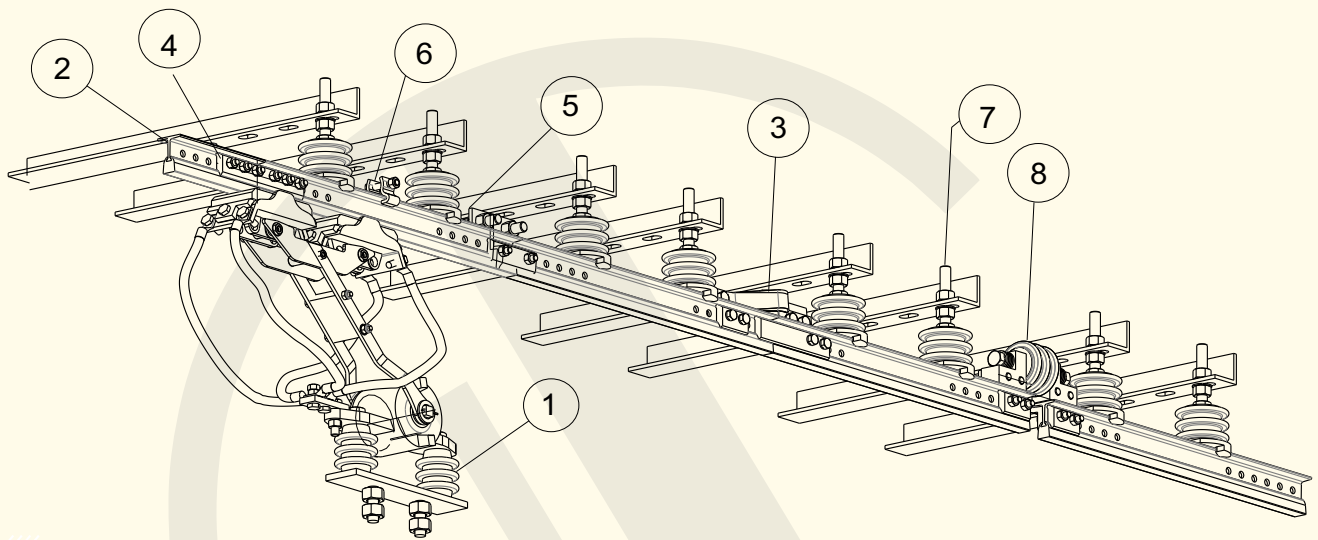
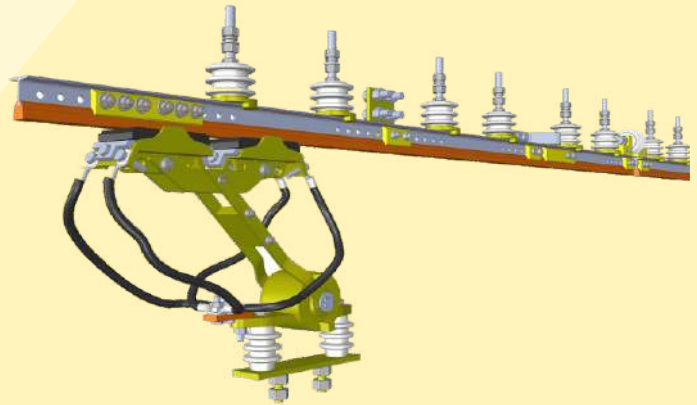


DISCOVER OUR RANGE OF COPPERHEAD RAIL SYSTEMS

INTRODUCTION

COPPERHEAD CONDUCTOR RAIL SYSTEM are used for areas with high-temperature, high-dust, high corrosion & other adverse circumstances.

Using the best quality and combination of copper strips and steel bars, current ranges are achieved from 495 Amps up to 1432 Amps which is enough to run multiple high capacity cranes and moving machinery running especially at iron and steel mills, heavy industrial plants etc. which are exposed to extremely high temperature during operation.



COMPONENTS

- 1) **CURRENT COLLECTOR** : Used to transfer the current from Copperhead Rail system to Running equipment's Mounted on the running equipment for continuous transfer.
- 2) **STEEL COPPERHEAD RAILS** : Combination of Steel and Copper Rail for carrying current through travel lengths as desire. Current capacity varies as per cross section of copper.
- 3) **EXPANSION SECTION** : Gap created between rails using copper strips for expansion and contraction of conductor bars.
- 4) **RIGID JOINTS** : Bolted type joints between 2 rails capable of transmitting the current.
- 5) **FEEDER CLAMP** : Bolted type between 2 rails and intended feed points integrated.
- 6) **LOCATING CLAMP** : In order to achieve controlled expansion of the conductor, fix points must be created. For this purpose, two locating clamps are placed to either side of the insulator. Fix points are always centered between two expansion joint.
- 7) **INSULATORS** : Hanger clamps for mounting the conductor rails. Installed at regular intervals with insulators for safety.
- 8) **HOSPITAL BAY INSULATOR** : For creating sick bays, maintenance bays. Mounting between rails bolted joint type with insulators used for separation. Looping through feeder clamps with isolation switches for using when desired.

Adequate Ampere Capacity must be provided to carry the anticipated electrical loads :

The total Ampere load is determined from the nominal rated full load current reduced by the duty cycle (f_{ED}) and by a diversity factor for non-simultaneous operation.

The average crane motor duty cycle is usually between 40% and 60%, depending on the type of application.

A diversity factor of 0.4 to 0.7 can be used when there are more than one crane on the same runway.

Example:

3 cranes, each $I_n = 300$ Amps.

Length of runway: 100 m (330')

Assumed duty cycle: 60% (ED)

Assumed diversity factor: 0.7

Ampere load per crane: $I_n \times f_{ED} = 300A \times 0.78 = 234A$

Ampere load per crane $234A \times 3 = 702A$

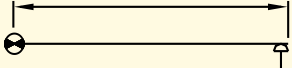
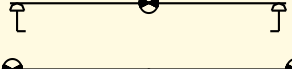
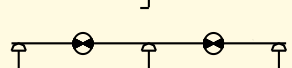
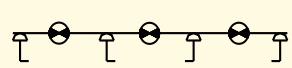
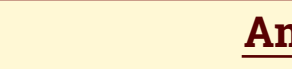
Total Ampere load when using

a diversity factor of 0.7(I_{NA}) : $702A \times 0.7 = 491.4A$

Selected conductors: S45/50

Effects of various Power feed Positions on Volt Drop Calculations.

Selection of feed-in points. The feed-in point for every application must be selected because the length L between power feed and conductor rail end is used for calculating the voltage drop. Following feed - in points can normally be used.

Powered Position	Schematic Diagram Collector symbol Indicates Positions of Maximum Volt Drop	Effective Length to be used in Volt Drop Calculations	Voltage Drop
Endfeed		$LVD = L$	Voltage Drop The allowable volt drop determines, the maximum allowable resistance of conductor. The value of volt drop within a conductor system is effected by effective length of system and current drawn. Volt Drop Calculation For A. C. Machine 3 phase ΔU Volt drop = length (D) x Impedance (Z) $\times$ Current (I) $\times 3\sqrt{}$ $U \% = \frac{\Delta U}{U_n} \times 100 [\%]$
Center-feed		$LVD = \frac{L}{2}$	
Two end feed		$LVD = \frac{L}{4}$	
Two feeds both in from end		$LVD = \frac{L}{6}$	
Three feeds at in from ends and centre		$LVD = \frac{L}{10}$	

Ambient Temperature Factor

Ambient Temperature	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C	85°C	90°C
Copperhead Rail fA	1.06	1.050	1.04	1.03	1.02	1.00	0.98	0.96	0.94	0.92	0.90	0.88

Ambient Temperature	95°C	100°C	105°C	110°C	115°C	120°C	125°C	130°C	135°C	140°C	145°C	150°C
Copperhead Rail fA	0.86	0.84	0.82	0.80	0.79	0.78	0.77	0.76	0.75	0.74	0.73	0.72

Sizing systems for multiple hoists, motors and/or multiple cranes

- For a single crane: Size the conductor bar to handle 100% of the current draw of the largest motor or group of motors, plus 50% of the combined current draw of the other motors on the vehicle.
- For multiple crane or vehicles: Determine the current draw for each crane/vehicle, using the method above. Sum all the current draws for each crane/vehicle then multiply the sum by the appropriate demand factor:

	f_s 1 cranes	f_M 2 cranes	f_M 3 cranes	f_M 4 cranes +
High frequency operation (bridgecranes for bulk material, production cranes)	0.9	0.9	0.8	0.7
Normal operation (container cranes, harbour cranes, overhead travelling cranes)	0.7	0.9	0.65	0.5
Small operation (storage cranes)	0.5	0.9	0.5	0.4

$$I_{NA} = I_N \cdot f_s \text{ (with one crane)}$$

$$I_{NA} = I_N \cdot f_s \cdot f_M \text{ (with several cranes)}$$

The Intermittent rating for Copperhead Rail System

DUTY CYCLE	f_{ED}
100%	1.00
80%	0.90
60%	0.78
50%	0.71
40%	0.63

Technical data Copperhead Rail System

CONDUCTOR TYPE	MAXIMUM CONTINUOUS AMPS	RESISTANCE Ohm/1000m	IMPEDANCE Ohm/1000m
S45/50-7S	460	0.178	0.266
S45/100-7S	680	0.119	0.223
S45/150-7S	880	0.089	0.203
S45/200-7S	1178	0.072	0.194
S45/300-7S	1482	0.051	0.182
S45/400-7S	1938	0.040	0.174
S45/500-7S	2010	0.033	0.169
S45/600-7S	2340	0.028	0.165

Impedance data based on 150 mm spacing between phases and 50 Hz.
Current Ratings are based on 60°C ambient temperature.



COPPERHEAD RAIL SYSTEM

Page 4 of 13



H. O. Unit - I : C-15/16, Nand Jyot
Industrial Estate, Andheri-Kurla
Road, Mumbai - 400072 ,
Tel : (022) 42469700/730
E-mail : sales@socgroup.in

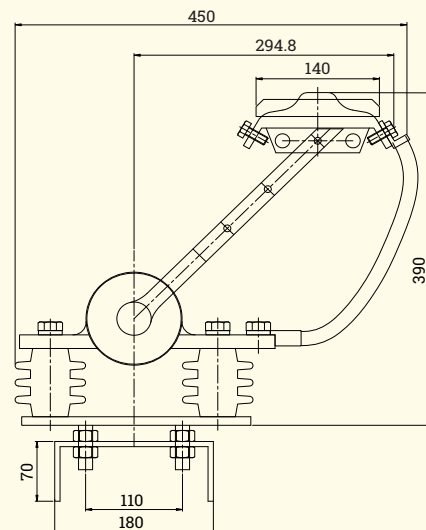
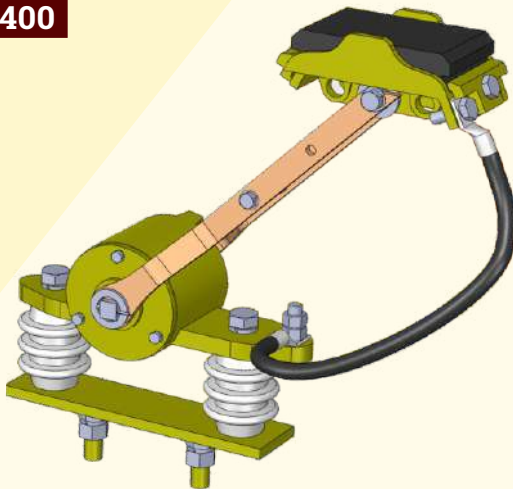
Unit - II: Plot No. 4912, G. I. D. C.,
Phase IV, Vatva,
Ahmedabad - 382445
Tel.: (079) 68169700/702/712
E-mail : enquiry2@socgroup.in

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COPPERHEAD RAIL SYSTEM

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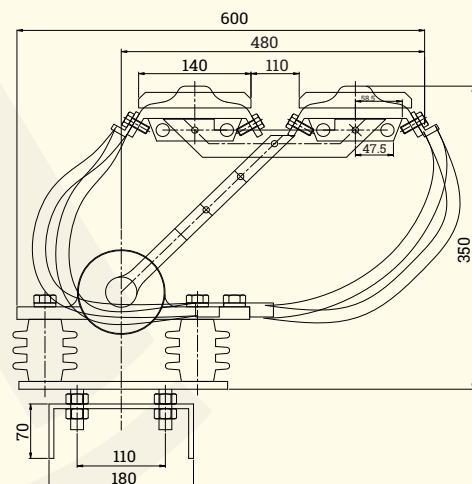
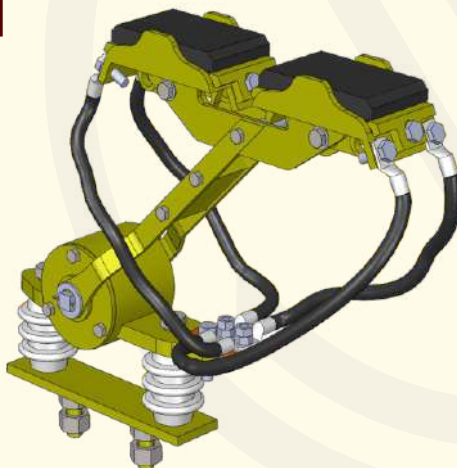
SCC400



TECHNICAL DATA

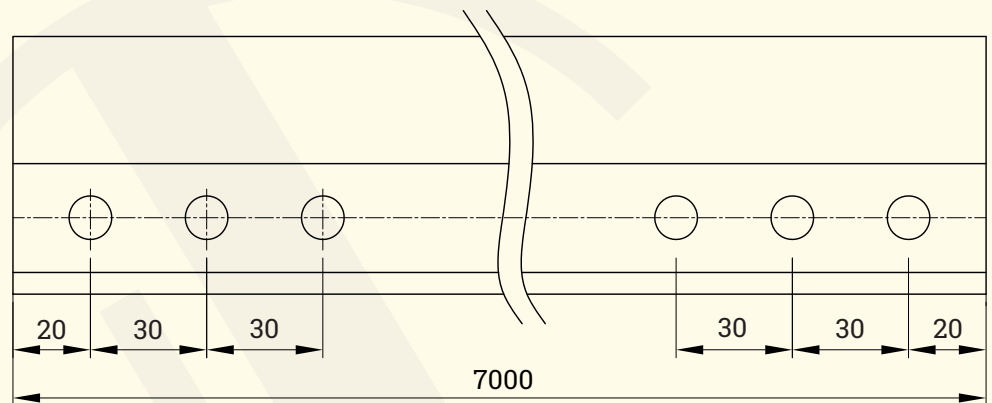
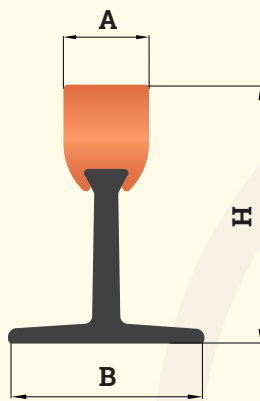
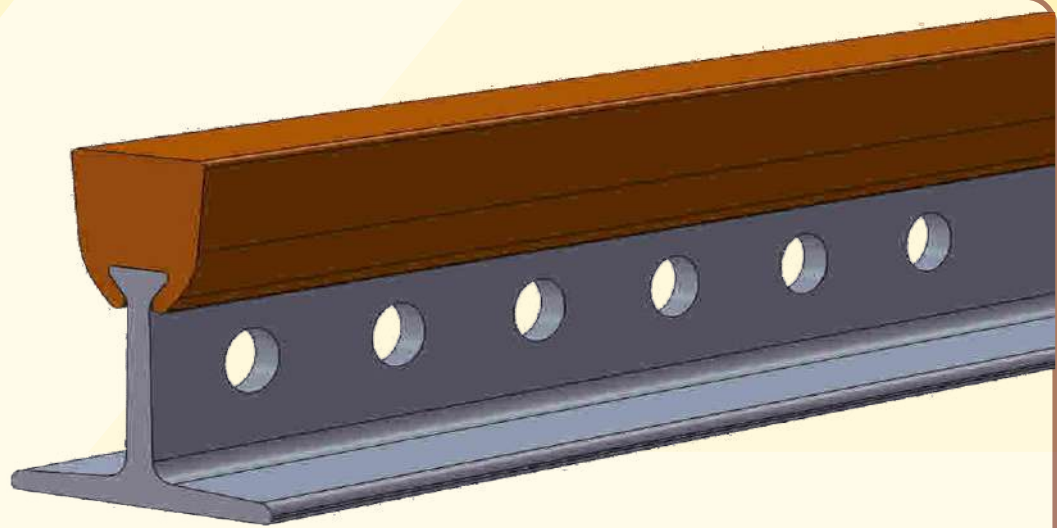
MODEL NO	SCC400
TYPE	5-SCC/400
CAPACITY	400A
WEIGHT	11.72KG
MOUNTING BOLTS	M16 x 110
WORKING HEIGHT	280+-60
CARBON PRESSURE	8KG
CARBON SIZE	140 x 100 x 30

SCC800



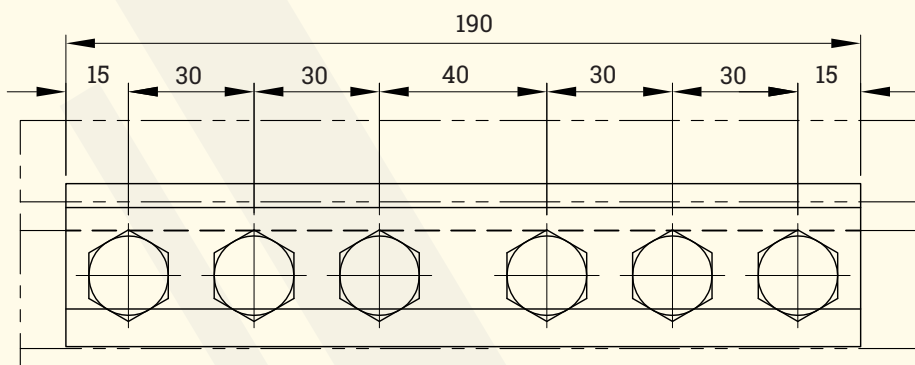
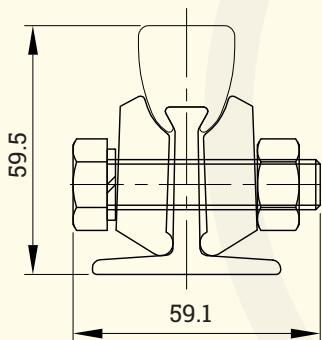
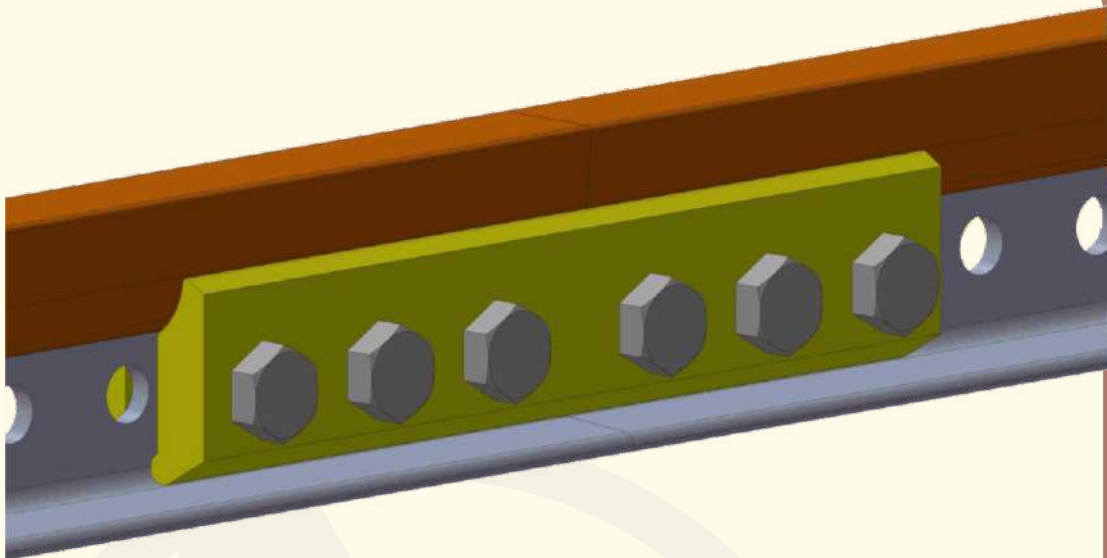
TECHNICAL DATA

MODEL NO	SCC800
TYPE	5-SCC/800
CAPACITY	800A
WEIGHT	15.342KG
MOUNTING BOLTS	M16 x 110
WORKING HEIGHT	380+-70
CARBON PRESSURE	8KG
CARBON SIZE	140 x 100 x 30



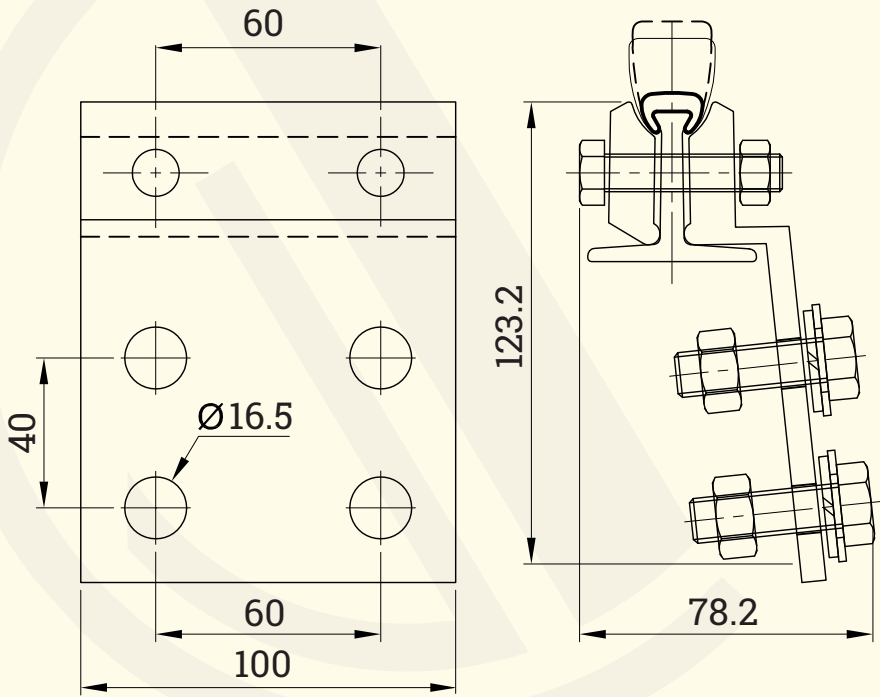
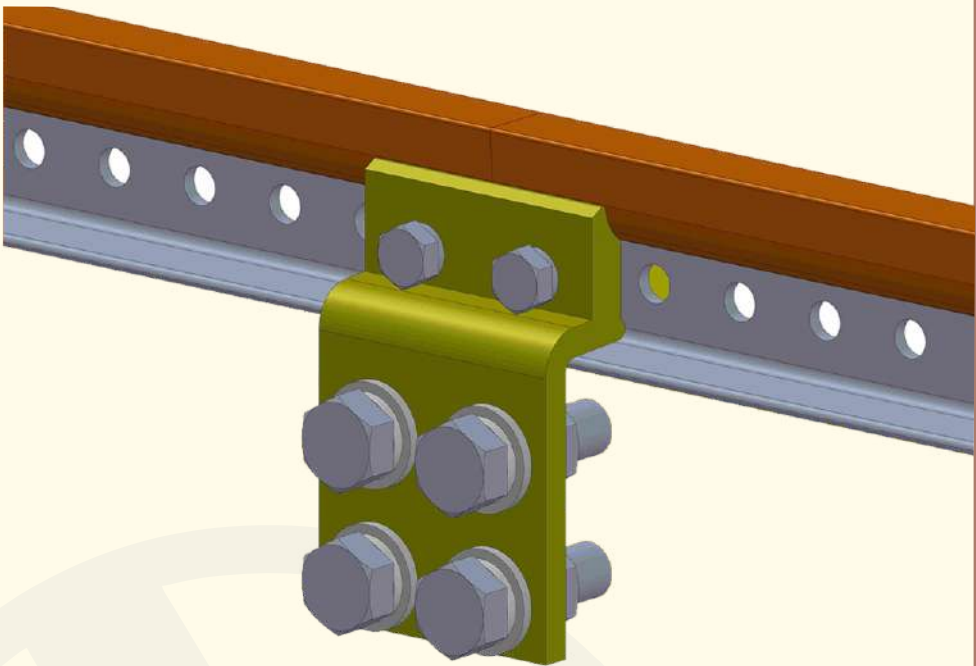
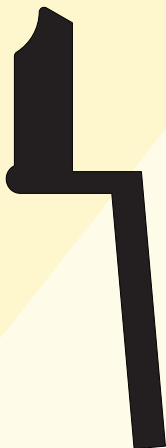
TYPE	COPPER CROSS SECTION SQMM	STEEL CROSS SECTION SQMM	EQUIVALENT COPPER CROSS SECTION SQMM	H MM	A MM	B MM	WEIGHT KG/M	MAX CONT. AMPS	RESISTANCE OhM/1000M	IMPEDANCE OhM/1000m
S45/50-7	65	355	115	43.1	14.6	45	3.23	460	0.178	0.266
S45/100-7	120	355	170	46.0	15.3	45	3.68	680	0.119	0.223
S45/150-7	170	355	220	48.3	17.3	45	4.13	880	0.089	0.203
S45/200-7	260	355	310	50.8	17.3	45	4.58	1178	0.072	0.194
S45/300-7	340	355	390	56.3	17.6	45	5.48	1482	0.051	0.182
S45/400-7	460	355	510	59.3	19.6	45	6.38	1938	0.040	0.174
S45/500-7	525	355	575	64.3	19.6	45	7.28	2010	0.033	0.169
S45/600-7	620	355	670	65.0	23.2	45	8.18	2340	0.028	0.165

NOTE: Details for Systems above 2340Amps available on request



RIGID JOINT SRJ45/300-800/6

TYPE	DESCRIPTION
SRJ45	Rigid Joint 6 hole for 45 Series

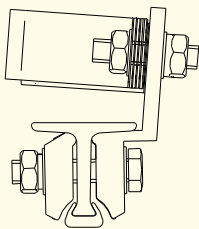
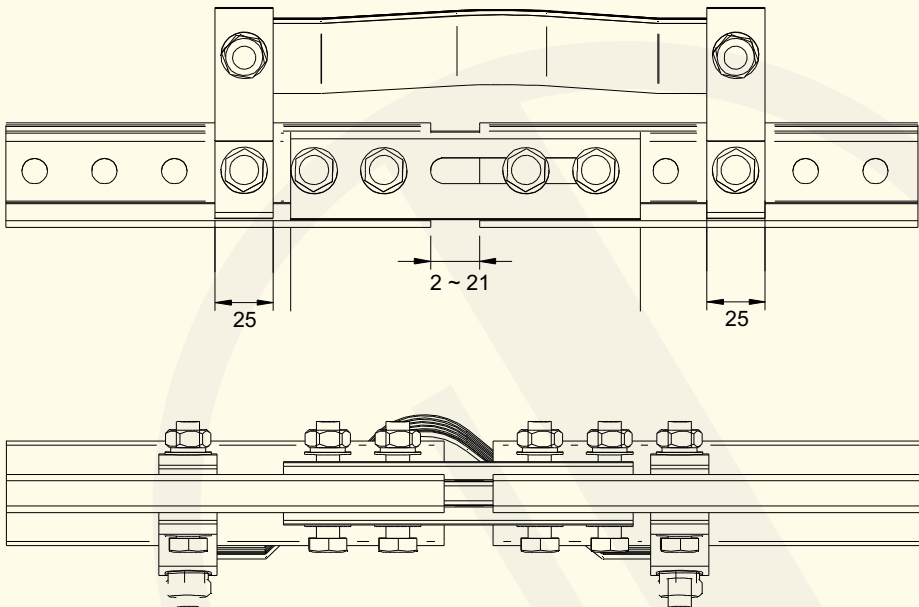
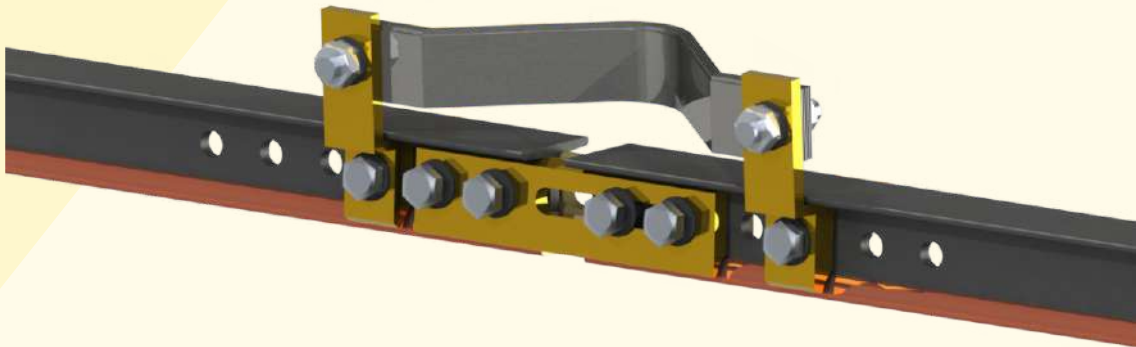


FEEDER CLAMP SFC45/300-800

MODEL NO	DESCRIPTION
SFC45	Feeder Clamp for 45 Series



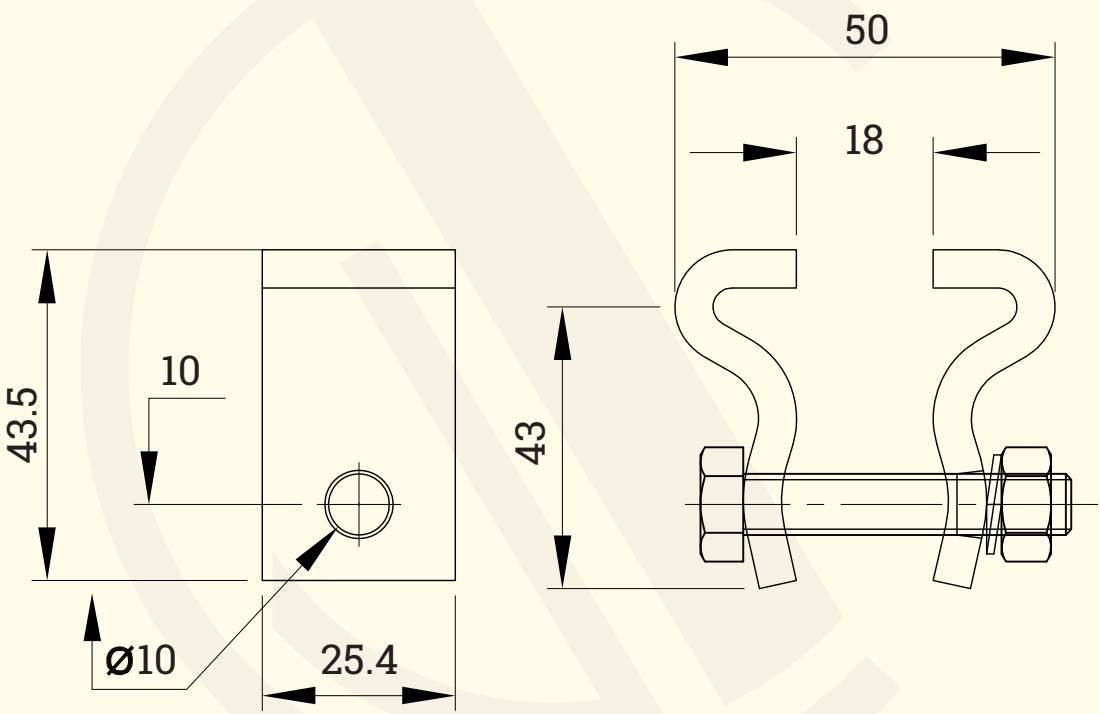
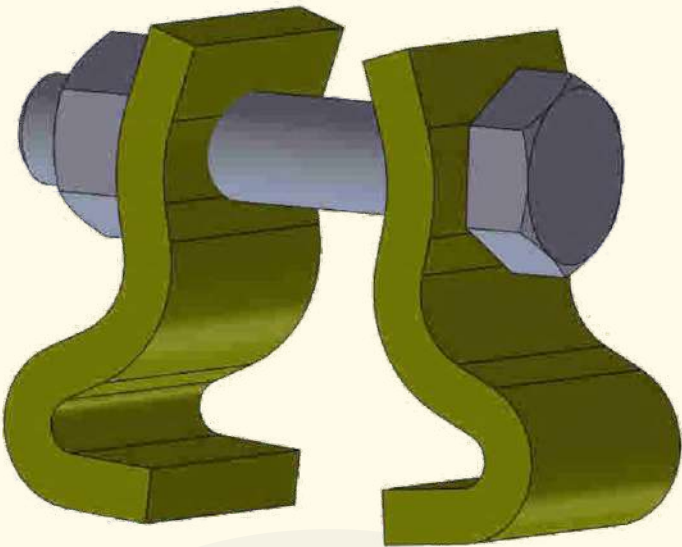
EXPANSION SECTION



MODEL NO.	AMPS.
SXJ45/50-200	upto 1200AMPS
SXJ45/200-600	1200, 2340AMPS

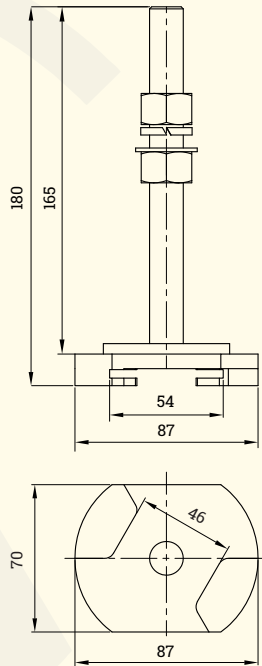
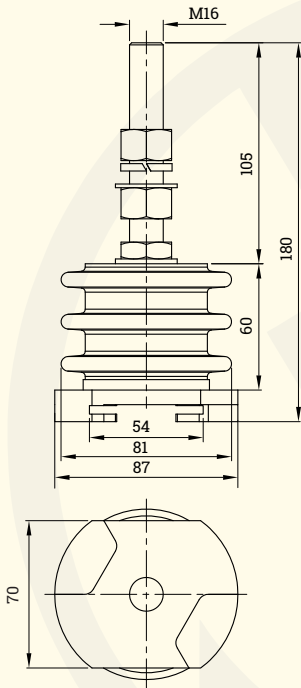
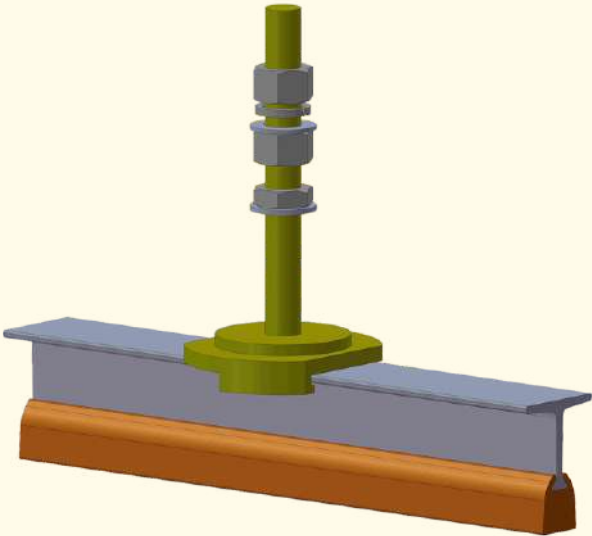
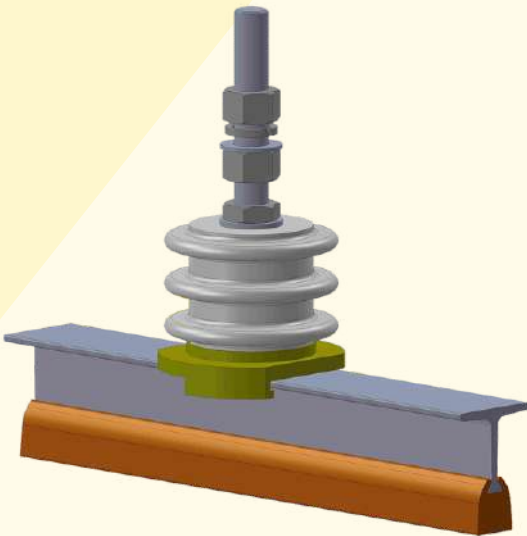


LOCATING CLAMP



LOCATING CLAMP - SLCP45

MODEL NO	DESCRIPTION
SLCP45	Securing Clamps for 45 Series



GFP INSULATOR (PHASE) INSULATOR - SIGP45

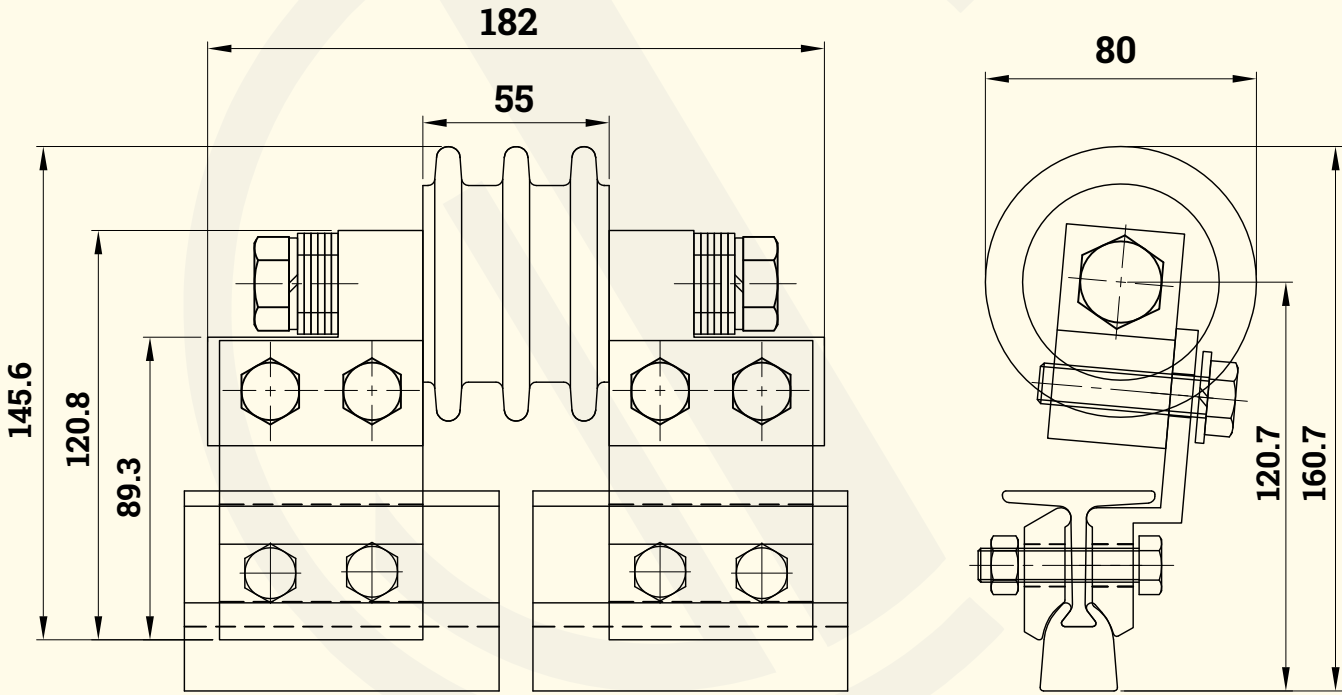
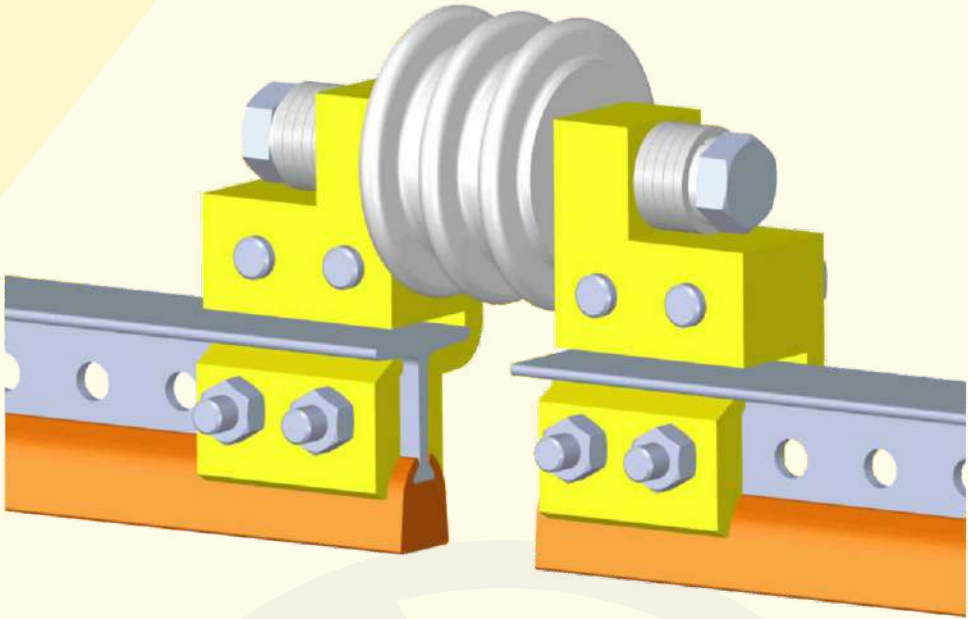
EARTH RAIL GUIDE - SIGP45E

MODEL NO	DESCRIPTION
SIGP45	GFP Insulator (Phase) - Phase Insulators for 45 Series
SIGP45E	Earth rail guide for 45 Series

***High Temperature Insulators available on request**

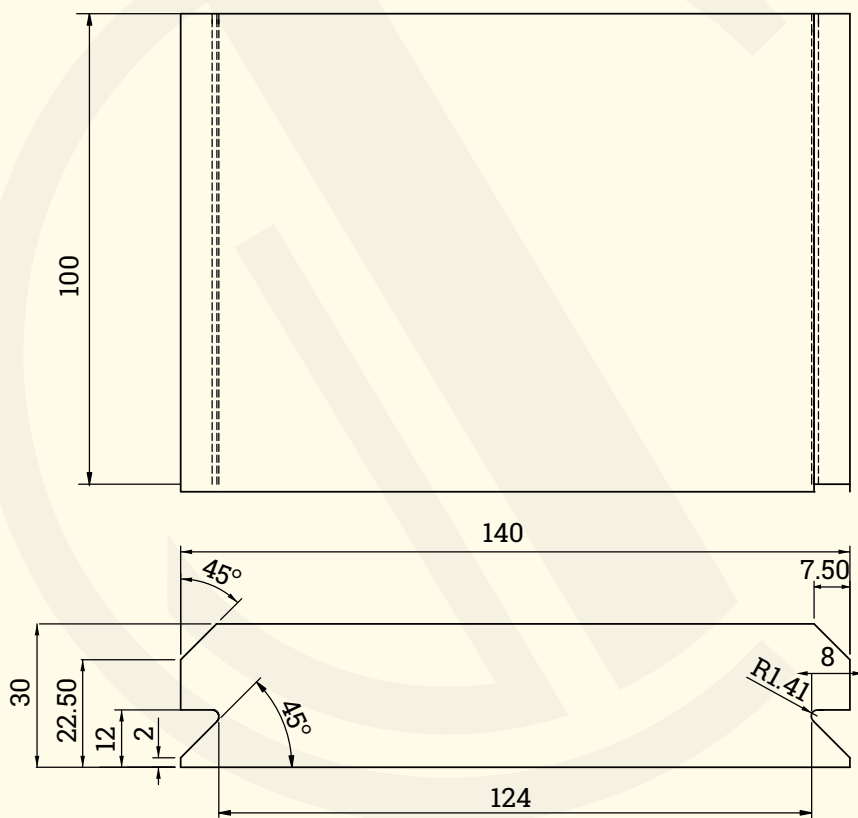
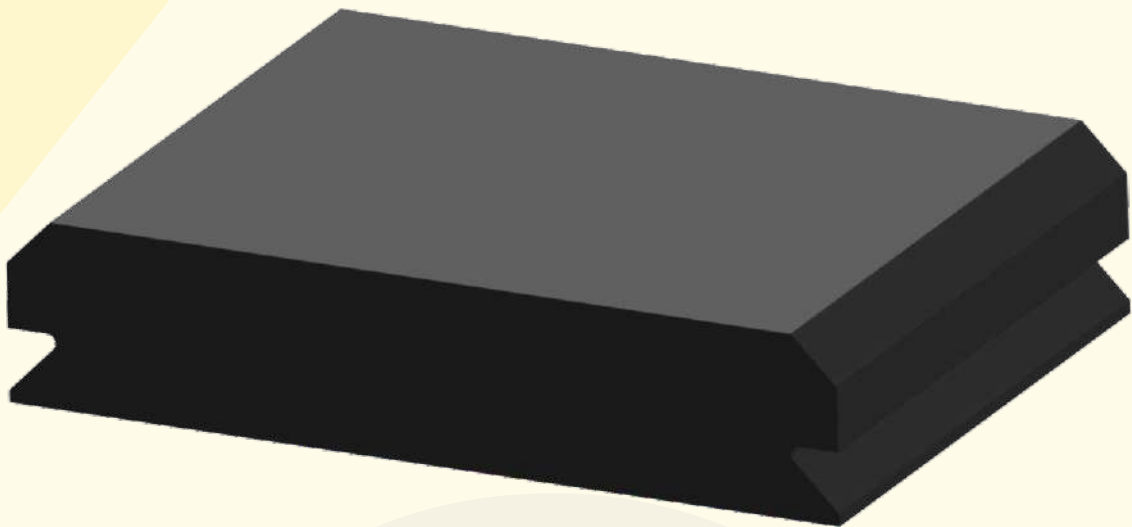


HOSPITAL BAY INSULATOR



HOSPITAL BAY INSULATOR SHBI45

MODEL NO	DESCRIPTION
SHBI45	HOSPITAL BAY INSULATORS FOR 45 SERIES



MODEL NO	DESCRIPTION
CCS400	CARBON SHOE for C.C. (Copperhead) for 400A

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