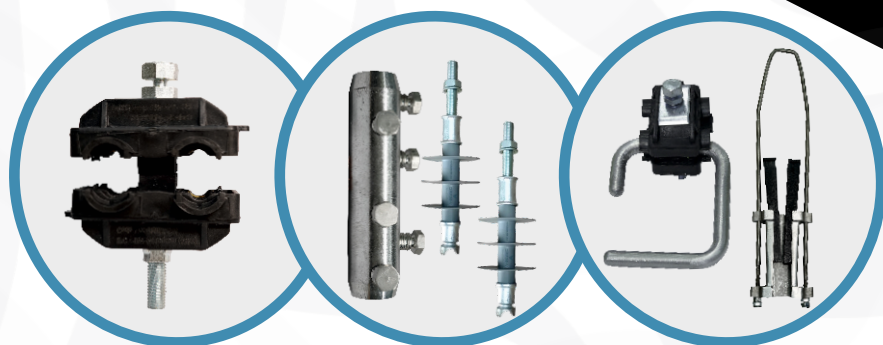


MEDIUM VOLTAGE COVERED CONDUCTOR — & — ACCESSORIES





V-Marc India
trust & reliability
has its foundation
in strong product
development
performed in
cooperation with
our customer.



Who We Are

Founded in 2006, V-Marc India has established itself as a trusted leader in wire and cable manufacturing. We specialize in producing a wide range of products, including LT/HT Power Cables, Medium Voltage Covered Conductors (MVCC), Aerial Bunched Cables, and various Domestic and Industrial Wires and Cables. At V-Marc India, innovation and customer satisfaction form the cornerstone of our vision and mission.

We are committed to continuous improvement and have recently expanded our manufacturing facilities with cutting-edge technology.

We are excited to introduce first time in India our latest innovations: the 'Flexi-Tough eB-HFFR' wires and 'eB+ power and solar cables,' developed using advanced e-Beam technology. With a strong focus on quality and a customer-centric approach, we look forward to shaping the future of wire and cable manufacturing.

Certifications

- ✓ ISO Management System : ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
ISO 27001:2022
- ✓ CE Europe by Certiva Ltd
- ✓ RoHS Compliance by Accenture International Certification
- ✓ BIS License : IS -694 (2010), IS-17048 (2018), IS-1554, (Part 1&2 : 1988), IS - 7098 (Part-1 : 1998), IS-7098 (Part-2 : 2011), IS-7098 (Part-3:1993), IS-14255 (1995), IS-398 (Part-2:1996), IS-398 (Part - 4 : 1994), IS-17293 (2020), IS-17505 (2021)

MVCC: MEDIUM VOLTAGE COVERED CONDUCTORS REDUCE LOSSES & ENHANCE SAFETY

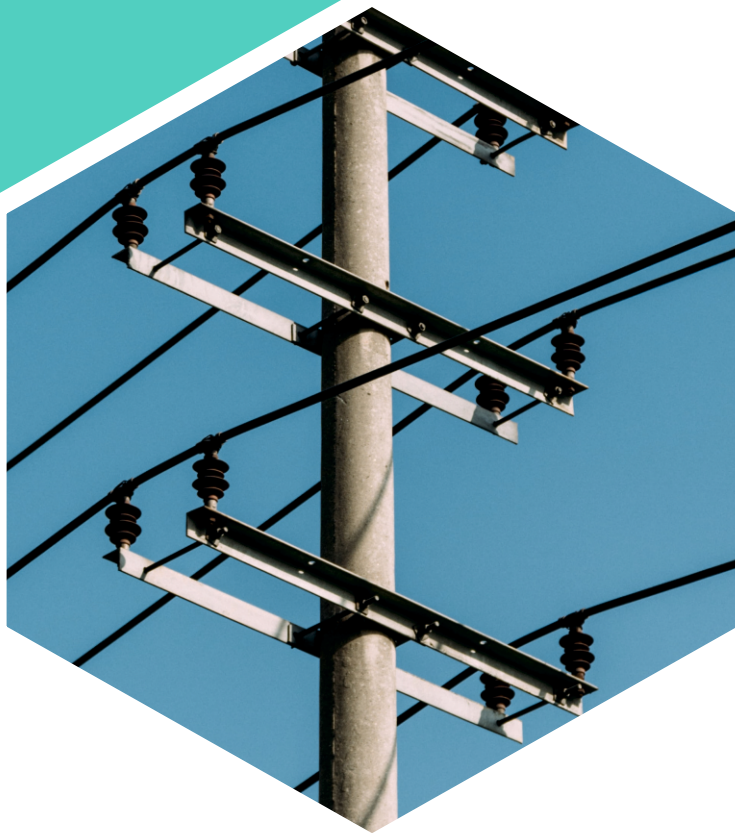
TOPICAL POINTS



- 1) Aggregate Technical & Commercial (AT&C) estimate India suffers 27% or Rs.40k crore distribution losses.
- 2) Electrocution of wild life and birds due to accidental contact with bare live conductors.
- 3) Need to secure power pilferage losses by upgrading and strengthening medium voltage distribution system.
- 4) Key focus on dense forest states – Odisha, Kerala, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Uttar Pradesh, Uttarakhand, Tamil Nadu, Chhattisgarh, Jharkhand etc.



1300 wild animals killed by electrocution in India within a decade: Reports NGO Wild Life Protection Society of India



Medium voltage distribution lines passing through wildlife sanctuaries pose a direct threat to the ecology. Big cats and birds often run the risk of being electrocuted due to these distribution lines.

Main concerns for electrical utilities:

Power interruptions

- Due to conductor slashing during stormy weather
- Tree branches and creeper in contact with bare live transmission lines

Corrosion and oxidation of bare conductors leads to :

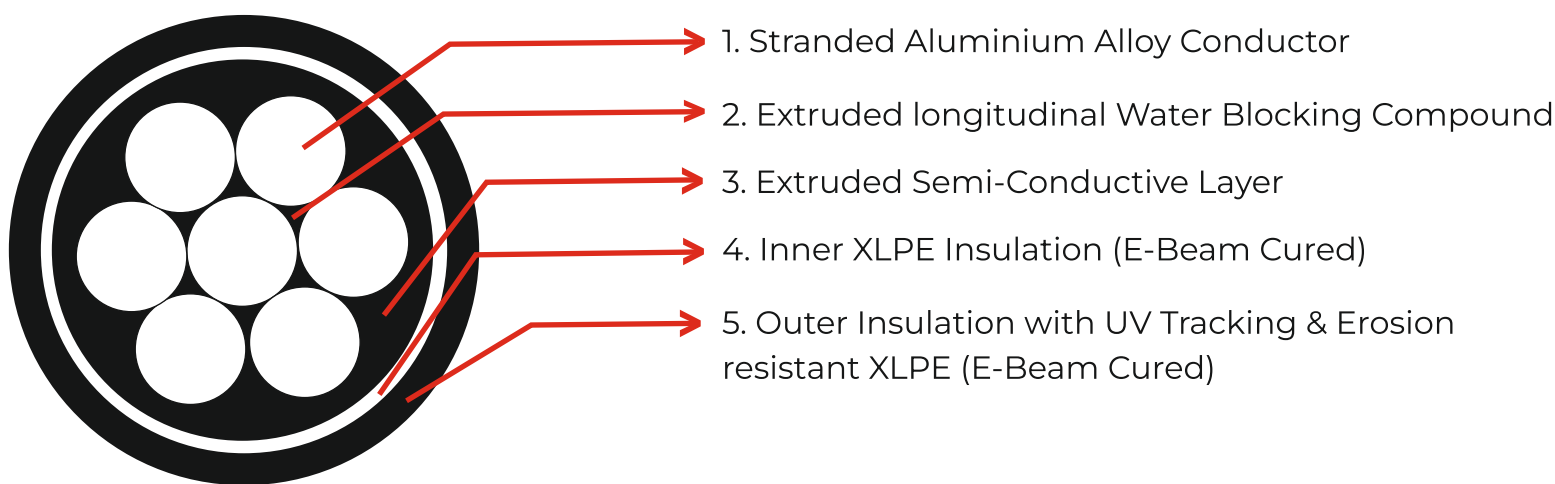
- High maintenance & operational cost
- High electrical losses
- Power transmission through densely populated areas like slum clusters, mega cities, housing societies, forests.

At V-Marc India Limited, we have identified the need of Covered Conductors for the transmission of high voltage electrical power and taken the initiative to minimize the electrical losses. This also offers protection from accidental electrocution of wild life in their natural habitat.

Technology

The conductor screen, insulation and outer insulation with Carbonblack are extruded simultaneously by a triple extrusion to ensure a permanent bond among the 3 layers and with conductor. MVCC from V-Marc is manufactured with E-beam Cured process.

Construction



Covered Conductors: Specifications Applicable Standards:

IS: 398 (Part-II), IS: 398(Part-IV), IEC: 61089, EN 50397-1:2006, BS EN 50182 Nominal Thickness

S.No	Description	Unit	Normal Thickness		
			11kV	22kV	33kV
1	Extruded Semi-Conducting Layer	mm	0.3	0.3	0.3
2	Inner Insulation of XLPE	mm	1.2	1.32	2.43
3	Outer Insulation with UV & Tracking & Erosion Resistant XLPE	mm	1.1	1.1	1.2



CONSTRUCTION:

MEDIUM VOLTAGE COVERED CONDUCTOR

Conductor

AAAC, AL-59, AL-59ACS. Special conductor as per customer requirement

1

H₂ Blocking Compound

Water blocking compound prevents from adverse impact on electrical and mechanical properties of MVCC. It remains stable at maximum operating temperature of 90°C

2

Conductor Screen

A semiconducting polymer screen is kept over the conductor to minimize the stresses of the conductor by smoothing its surface. This semiconducting layer is kept under the extruded insulation.

3

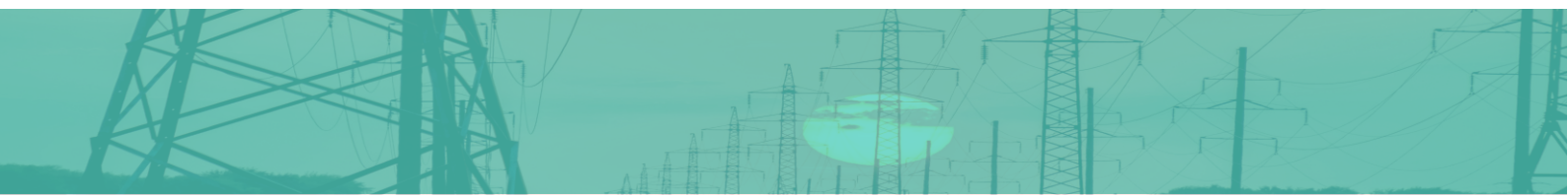
Insulation Outer Covering

The insulation is dual layered with the main inner layer being XLPE and the outer layer being of XLPE fused, to make it UV protected, non-tracking and erosion resistant. All layers including semiconducting screen are extruded simultaneously with a triple head extruder so as to bind on the conductor with one another.

4

*Cross Linked
By
e-Beam
Technology*

5



Technical comparison of Chemically Cured Covered Conductors and e-Beam MVCC Cable

S. No.	Factor	Chemically cured Covered Conductors	e-Beam MVCC cable	Improvement %
1	Maximum operating temperature	90°C	125°C	39%
2	Insulation	Cross-linked polyethylene	Electron beam cross-linked polyethylene	-
3	Short circuit temperature	250°C	300°C	20%
4	Lower operating temperature	-25°C	-40°C	60%
5	Min. tensile strength	12.5 N/MM ²	15.0 N/MM ²	20%
6	Heat resistance	Good	Excellent	-
7	Heat ageing	135°C / 7 days	160°C / 7 days	18.50%
8	Electric load	Suitable for regular load	Suitable for greater load	-
9	Variation in tensile strength & elongation at break after ageing	±25%	±15%	66%
10	Service life	20-25 years	40 years	60%

Advantage of e-Beam cross linking over Chemical curing

S. No.	Parameters	Chemical curing	e-Beam cross linking
1	Cross-linking bond	C-S x - C or C - O x - C	C - C
2	Maximum operating temperature	90°C	125°C
3	Estimated life of cable	20-25 years	40 years
4	Volume resistivity at room temperature	1x10 ¹⁴ Ohm-cm	1x10 ¹⁵ Ohm-cm
5	Maximum Current carrying capacity (for a cable of size 99 sq.mm)	254 amps	350 amps
6	Effect on high overload current	Burned	Not burned
7	Cold bend test	-15°C	-25°C
8	Blooming effect	Chances to bloom to outer layer leading to surface deterioration	No effect
9	Polymer degradation during cross-linking	A cross-linking occurs at high temperature	As eB cross-linking occurs at room temperature
10	Oxidative degradation	Yes	No

Conventional cross-linking employs thermally induced chemical cross-linking process, which has drawbacks such as high temperatures that can degrade polymer lifespan

Features of MVCC e-Beam

- The electron beam cross linked cables enhances mechanical, electrical, thermal, chemical and weathering properties and enhances life of product
- Improve temperature withstand capability which leads to an addition current capacity upto 30%.
- High current carrying capacity is more than 30% in comparison to the traditional.
- The e-beam cross-linking technology not only increases life and the current carrying capacity, but also prevents fires due to overload short circuits and thus saves precious lives and property.
- High insulation resistance at elevated temperature.
- Resistance to corona effect.
- Low direct losses which reduce current leakage

Benefits of e-Beam Processing

- e-Beam cross-linking protects wire and cable insulation from high temperatures during short-circuits.
- It improves tensile strength, abrasion, thermal, flame-propagation, deformation, and cut-through resistance.
- The process increases shear and compressive strength.
- e-Beam curing is eco-friendly, causing zero environmental pollution.
- EBXL cables are poised to replace traditional cables in key applications,
- Using electron-beam accelerators, insulation materials can be cross-linked within seconds.
- Homogeneous irradiation ensures uniform cross-linking of product.



CURRENT CARRYING CAPACITY OF MVCC CONDUCTOR

Stranded circular non compacted A.A.A.C (AL-59 and AL-59 ACS) Longitudinal water tight conductor, Conductor screened with extruded semiconducting layer, Inner covering by natural colour XLPE (Dry Nitrogen cure & Nitrogen Cool system) followed by outer covering with black XLPE (UV resistance, anti-tracking & Erosion Resistant) covered conductor as per BS-EN-50397-1:2020, SS-4240813 & SS- 4240814 for rated voltage 11 kV & 33 kV Grade.

11 kV MVCC

Size sqmm	Current carrying Capacity (Amp) At 40°C with continuous conductor temperature 90°C	
	AAAC-AL-59	AAAC-AL-59(ACS)
31	160	176
62	246	273
70	260	289
78	275	306
99	326	361
100	330	366
105	339	378
120	368	418
160	435	496
232	546	619
241	560	636

33 kV MVCC

Size sqmm	Current carrying Capacity (Amp) At 40°C with continuous conductor temperature 90°C	
	AAAC-AL-59	AAAC-AL-59(ACS)
160	427	485
232	537	610
241	551	627

UV RESISTANT AND ANTI-TRACKING PROPERTIES OF COVERED CONDUCTORS

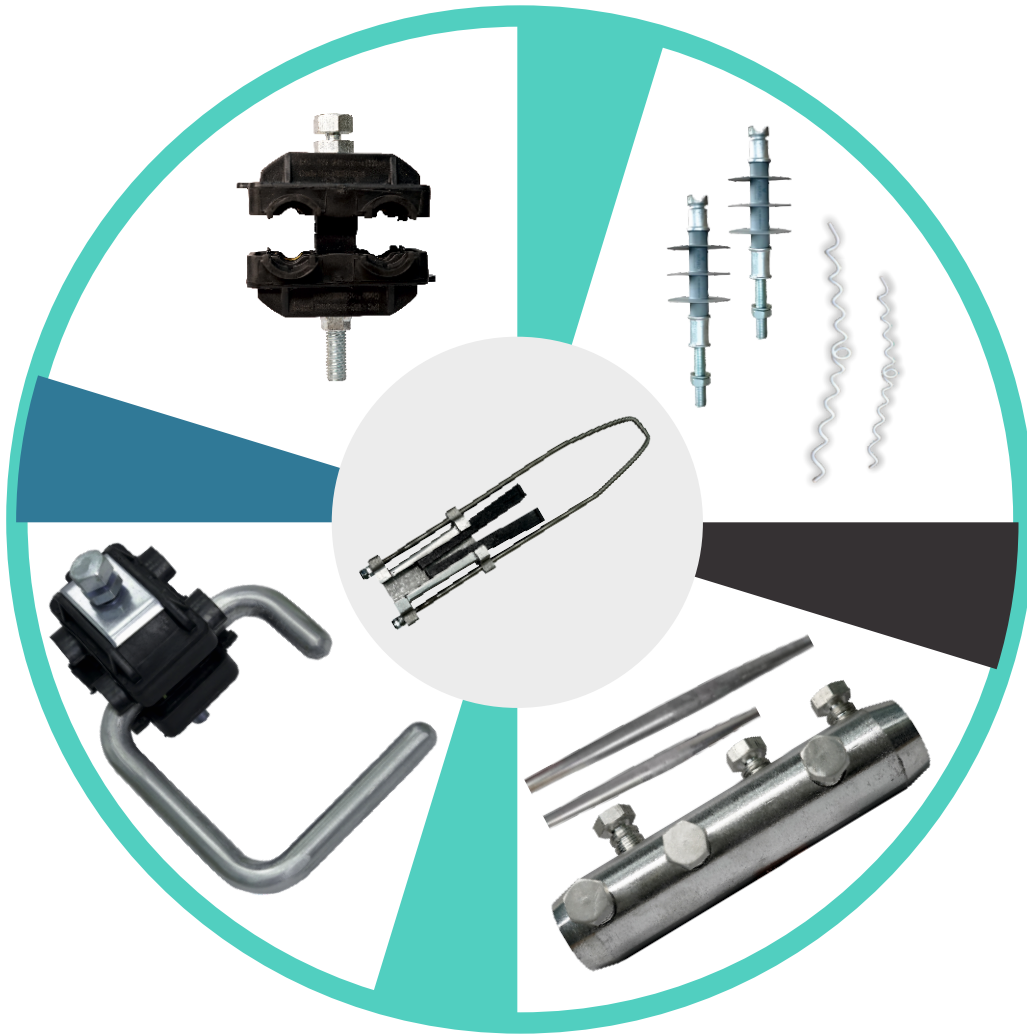
Designed to have ultra-violet rays protection properties along with anti-tracking properties so that the covered conductor works efficiently under adverse outdoor conditions of distribution lines. The material must also be resistant to oil, salt, arcing, corrosion, humidity and pollution in atmosphere.

Advantages of MVCC

- Easy and fast installation as compared to underground cables and aerial bunched cables.
- Reduce power interruptions due to no conductor slashing by using covered conductor.
- Negligible accidental electrocution or death of wildlife animals and big birds due to covering on bare conductors.
- Minimize tower related cost due to phase to phase conductor distance is reduced
- Protective layers on the conductor prevents aluminum corrosion and oxidation, resulting in low maintenance cost.
- Prevents bush fires.
- Lessens need for tree trimming.
- Possibility of power-pilferage is reduced substantially
- Helps reducing electrical losses and resolves safety issues in densely populated areas.
- Overcomes costly right of way issues and line can be commissioned faster
- Reliable in bad weather conditions like snow fall, windy or stormy conditions.
- Better life span as compared to MV Cable (Aerial Bunched or underground cable).
- Ensures safety, while power transmission is carried out over railway lines, roads crossings, rivers, lakes etc.



MVCC ACCESSORIES

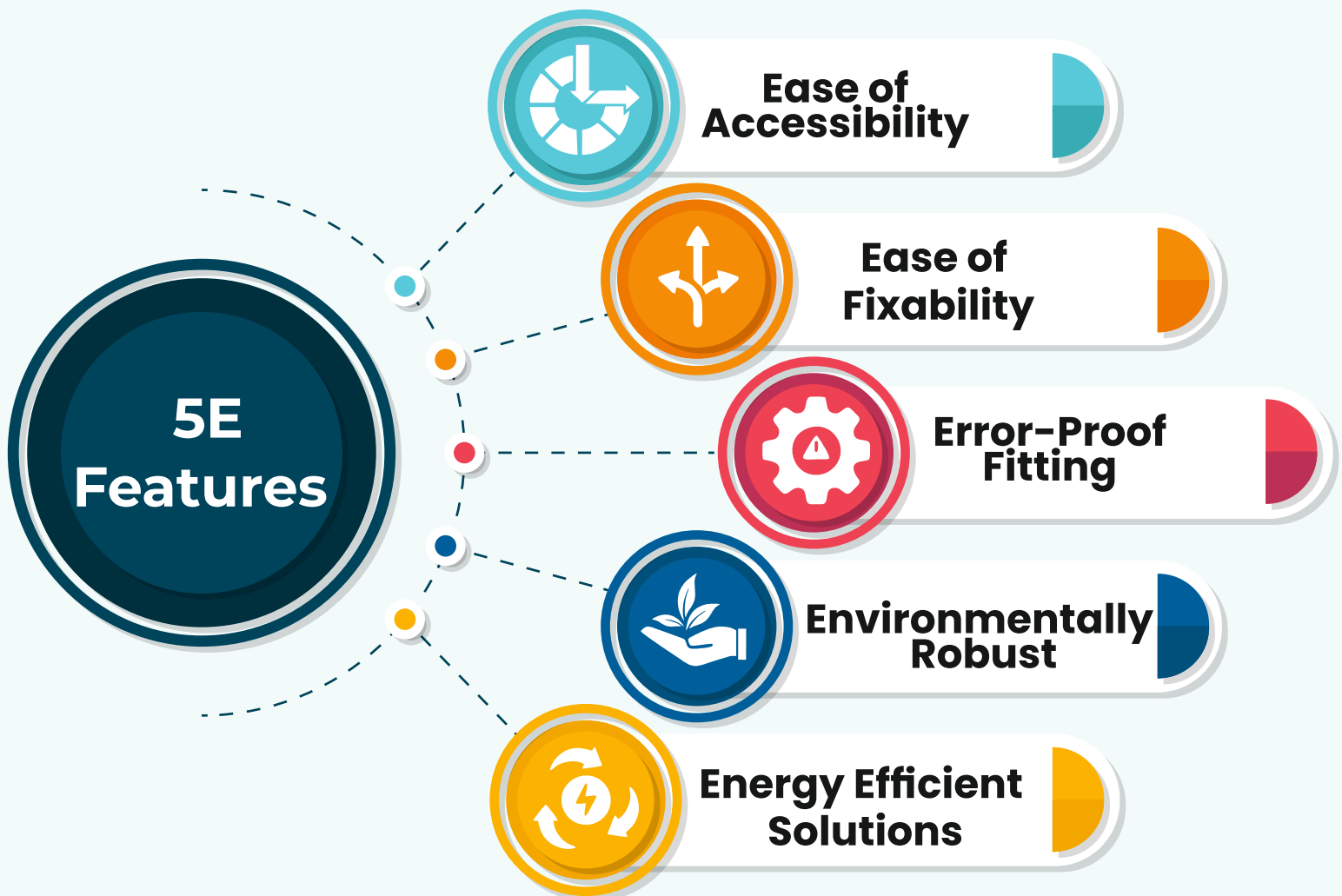


Sr. No.	Description	33kV	11kV
1	Tension /Dead End Clamp	✓	✓
2	Cable Tie for Pin Insulator	✓	✓
3	IPC for Cover to Cover	✓	✓
4	IPC for Cover to Bare	✓	✓
5	IPC for Bare to Bare	✓	✓
6	Mid Span Jointing Kit Ferrule	✓	✓
7	IPC for Al bail for Earthing	✓	✓
8	Lightning /Surge Arrester	✓	✓
9	Disc Insulator Polymer	✓	✓
10	Pin Insulator Polymer	✓	✓
11	Suspension Clamp	✓	✓

5E Features

Of

MVCC Accessories

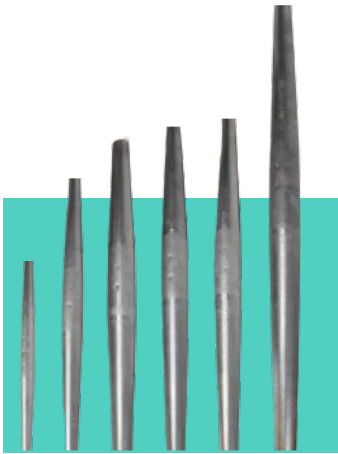


Mid Span Jointing Kit (11kV to 33kV)

Description:

- 1. All weather-proof Mid Span Jointing Dia 25.5~29.2mm
- 2. Good for jointing conductor 160~241 Sqmm
- 3. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
- 4. Maximum Humidity: 99%
- 5. Average Annual Rainfall: more than 925 mm
- 6. Max Wind Pressure : 260 (kg/sqmm)
- 7. Average Number of Rainy Days: 150
- 8. Type Tested & Certified design as per NFC/IEC: 50397-2 Standard
- 9. Specially designed and fabricated to create high tensile conductor joint
- 10. High quality 6063 Aluminium for good mechanical strength
- 11. Warranty: 5 Years*

*(Only manufacturing defects are covered under warranty)



Special Differentiate Features:

- 1. All weather-proof Mid Span Jointing Dia 25.5~29.2mm
- 2. Good for jointing conductor 160~241 Sqmm
- 3. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
- 4. Maximum Humidity: 99%
- 5. Average Annual Rainfall: more than 925 mm
- 6. Max Wind Pressure : 260 (kg/sqmm)
- 7. Average Number of Rainy Days: 150
- 8. Type Tested & Certified design as per NFC/IEC: 50397-2 Standard
- 9. Brass/Aluminium/Copper Plated Teeth Piercing
- 10. Shielded with rubber extended cover
- 11. Water Ingress proof
- 12. Easy & Error proof fitting arrangement
- 13. Double head shear bolt with tightening torque: 35Nm



High Quality Glass Filled, Nylon Material



Rubber Rain Shield

Brass/Aluminium Teeth

Water Ingress Proof

Double Head Shear Bolt



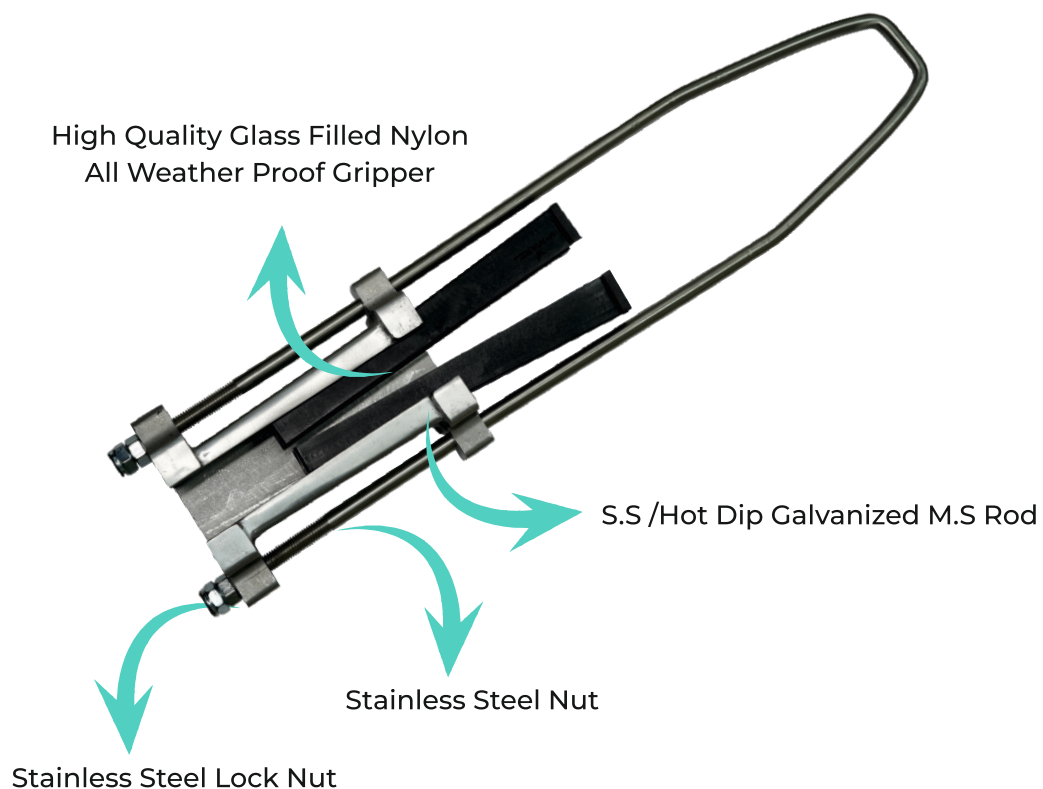
Tension Clamp (Dead End)

Description:

All weather-proof Dead-End Clamp for Conductor Dia 25.5~29.2 mm

1. Good for Tensioning conductor 160~241 sqmm
2. Type Tested & Certified design as per NFC/IEC: 50397-2 Standard
3. High quality and easy to install
4. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
5. Single screw tightening system
6. Suitable for Aluminium & Copper Conductor
7. SMDL: 36kN
8. SMFL: 36kN
9. Warranty: 5 Years*

*(Only manufacturing defects are covered under warranty)



Special Differentiate Features:-

1. All weather proof
2. High Quality Glass Filled Nylon All Weather Proof Gripper
3. Stainless Steel Lock Nut
4. Stainless Steel Rod
5. Stainless Steel Nut
6. Easy & Error proof fitting arrangement

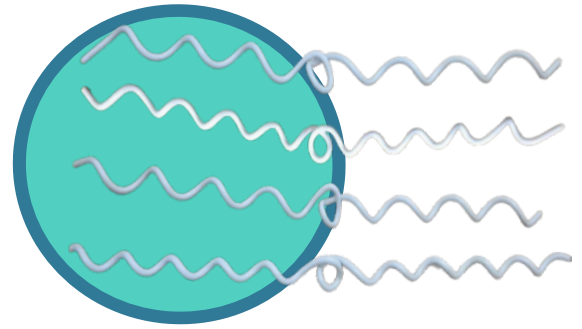
Helical Cable Tie

Description:

All weather-proof Helical Insulated Tie

1. Easy installation due to flexible/helical shape.
2. Good for binding conductor with Insulator and steady in high wind pressure.
3. Type Tested & Certified design as per NFC /IEC: 50397-2 Standard.
4. Thick Insulated to protect conductor insulation with proper gripping.
5. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain.
6. High quality k-67 polymer insulation for mechanical, thermal, chemical & other properties.
7. Covering design suitable for all weathers.
8. Warranty: 5 Years*

*(Only manufacturing defects are covered under warranty)



Aluminium Earthing Bail

Description:

All weather-Aluminium Earthing Bail for Conductor Dia 18.5~29.2 mm

1. All weather-proof Mid Span Jointing Dia 25.5~29.2mm
2. Good for jointing conductor 160~241 Sqmm
3. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
4. Maximum Humidity: 99%
5. Average Annual Rainfall: more than 925 mm
6. Max Wind Pressure : 260 (kg/sqmm)
7. Average Number of Rainy Days: 150
8. Type Tested & Certified design as per NFC/IEC: 50397-2 Standard
9. G-shaped Aluminium Earthing Bail
10. Branching and Temporary earthing can be made with IPC
11. Corrosion resistant aluminium Bare

*(Only manufacturing defects are covered under warranty)



Mid Span Jointing Kit Ferrule

Description:

All weather Mid Span Jointing Kit Aluminium Ferrule with shear head bolt.

1. All weather-proof Mid Span Jointing Dia 25.5~29.2mm
2. Good for jointing conductor 160~241 sqmm
3. Type Tested & Certified design as per NFC/IEC: 50397-2 Standard
4. Heat shrink joint for MVCC or One Core Cable, Al/Cu conductor
5. The kit contains components for MVCC cable core.
6. Mechanical connectors are included in the kit.
7. The joint kits comprises of heat shrinkable tubes and all necessary assembly components.
8. High quality 6063 Aluminium for good mechanical strength
9. Heat shrink: Halogen Free, thermal melt adhesive liner & high resistance abrasion
10. Warranty: 5 Years*

*(Only manufacturing defects are covered under warranty)



Suspension Clamp

Description:

1. All weather proof Pin Insulator
2. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
3. Maximum Humidity: 99%
4. Average Annual Rainfall: more than 925 mm
5. Max Wind Pressure: 260 (kg/sqmm)
6. Average Number of Rainy Days: 150
7. Type Tested & Certified design as per IEC: 61109 Standard
8. Silicon Rubber material to withstand all-weather conditions
9. Aerodynamic Shed
10. Forged and Injection Moulding
11. Warranty: 2 Years*

*(Only manufacturing defects are covered under warranty)



Disc Insulator

Description:

1. All weather proof Disc Insulator
2. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
3. Maximum Humidity: 99%
4. Average Annual Rainfall: more than 925 mm
5. Max Wind Pressure: 260 (kg/sqmm)
6. Average Number of Rainy Days: 150
7. Type Tested & Certified design as per IEC: 61109 Standard
8. High quality Silicon Rubber material to withstand all-weather conditions
9. Aerodynamic Shed
10. Forged and Injection Moulding
11. Warranty: 2 Years*

*(Only manufacturing defects are covered under warranty)



Pin Insulator

Description:

1. All weather proofs Pin Insulator
2. Steady for operational temperature (-)13°C to (+)125 °C and (+)80cm heavy rain
3. Maximum Humidity: 99%
4. Average Annual Rainfall: more than 925 mm
5. Max Wind Pressure: 260 (kg/sqmm)
6. Average Number of Rainy Days: 150
7. Type Tested & Certified design as per IEC: 61109 Standard
8. Silicon Rubber material to withstand all-weather conditions
9. Aerodynamic Shed
10. Forged and Injection Moulding
11. Warranty: 2 Years*

*(Only manufacturing defects are covered under warranty)







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Plot No. 3, 4, 18 & 20A, Sector - I IDC,
SIDCUL, Haridwar, Uttarakhand - 249403

Unit 2:

Khasra No-1, 2 & 6, Village- Mukarrabpur,
Bahadrabad-Bhagwanpur Road,
Kaliyar, Roorkee, Haridwar, Uttarakhand - 247667

Sales Office:

3rd floor, C-27 Trapezoid IT Park, C Block,
Phase 2, Industrial Area,
Sector 62, Noida, Uttar Pradesh - 201309

Sales & Export Office:

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C Cross Road, Opp. Gate No2, MIDC, SEEPZ,
Andheri (East), Mumbai, Maharashtra - 400093