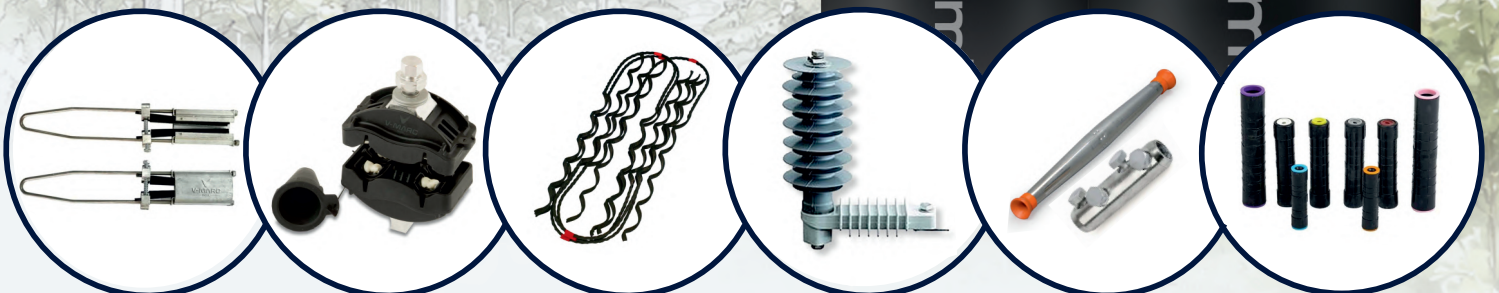




MEDIUM VOLTAGE COVERED CONDUCTOR & ACCESSORIES





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.

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 : 1988), IS-7098
(Part-I : 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-398 (Part-6), IS-17293 (2020), IS-17505 (2021)
- ✔ MVCC Cables and Accessories follow the quality standards
IEC-50397-1 and IEC-50397-2

MVCC Reduce Losses And 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 & 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 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 Utilies :

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 :

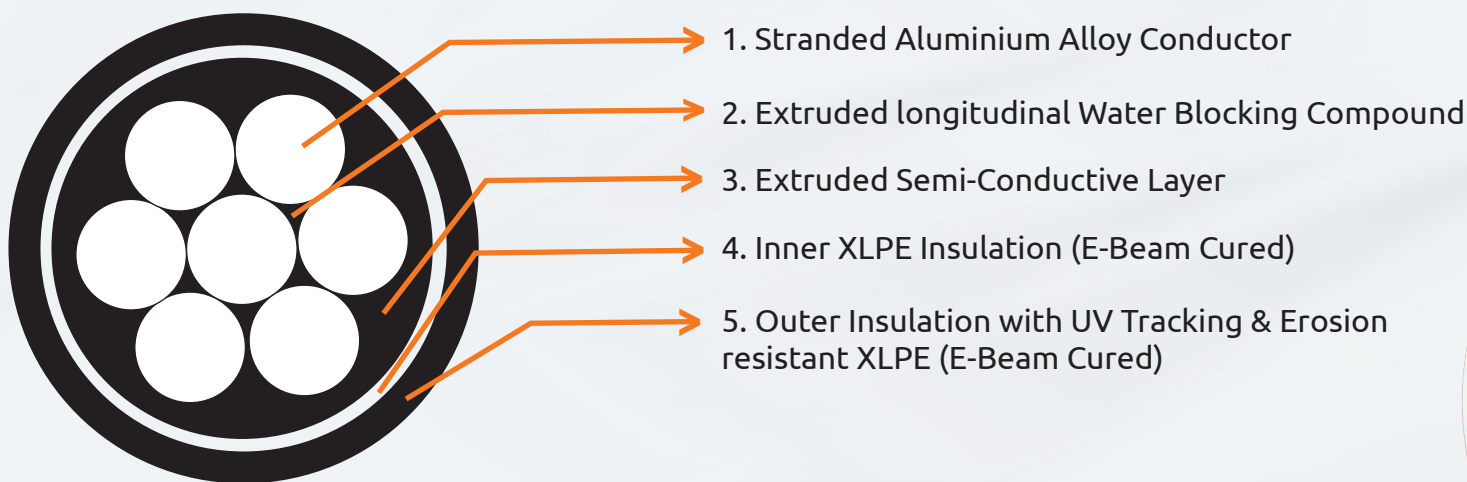
- High maintenance & operational cost
- High electrical losses
- Power transmission through densely populated areas like slum clusters, mega cities, housing societies, forests.

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 Carbon black 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



Applicable Standards :

MVCCs are manufactured in accordance with internationally recognized standards, including

- IEC 61089
- IS 398 (Part-II)
- EN 50397
- IS 398 (Part-IV)



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

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

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.

Insulation Outer Covering

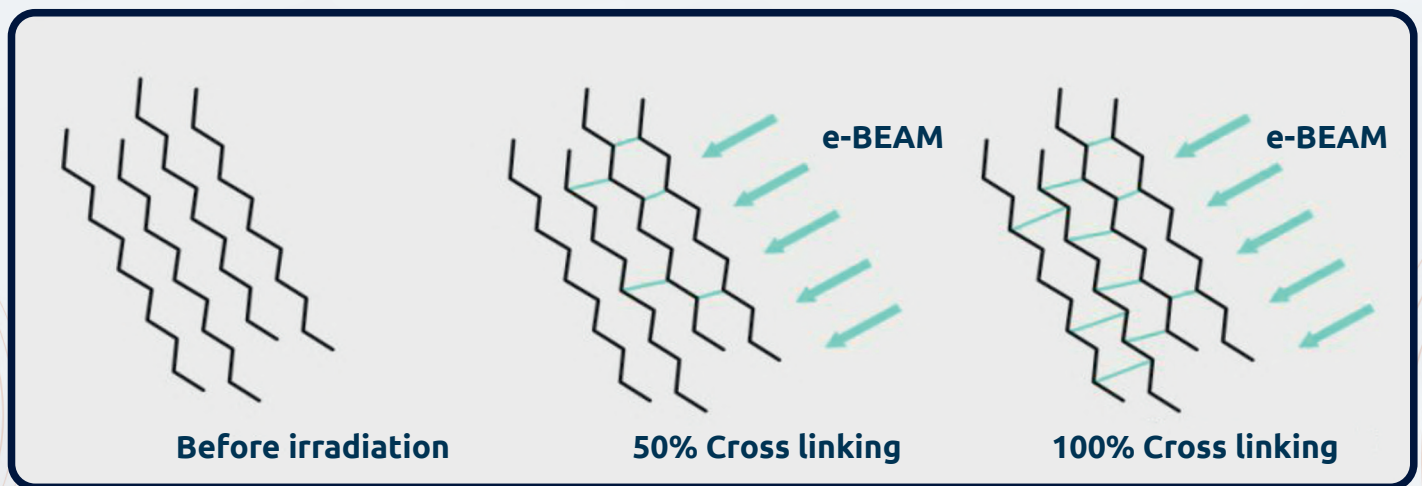
The insulation is dual layered with the main inner
layer being XLPE and the outer layer being of XLPE
fused, to make it UV protected, non-tracking and
erosion resistant. All layers including semiconducting
screen are extruded simultaneously with a triple head
extruder so as to bind on the conductor
with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

**Cross Linked By
e-Beam Technology**



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	Maximum Current carrying capacity (for a cable of size 99 sq.mm)	254 amps	330 amps
5	Effect on high overload current	Burned	Not burned
6	Cold bend test	-15°C	-25°C
7	Blooming effect	Chances to bloom to outer layer leading to surface deterioration	No effect
8	Polymer degradation during cross-linking	A cross-linking occurs at high temperature	As eB cross-linking occurs at room temperature
9	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 Medium Voltage Covered 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- rated voltage 11kV & 33kV Grade.

11 kV MVCC

Size sqmm	Current carrying Capacity (Amp) At 400C 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 400C with continuous conductor temperature 90° C	
	AAAC-AL-59	AAAC-AL-59(ACS)
160	427	485
232	537	610
241	551	627

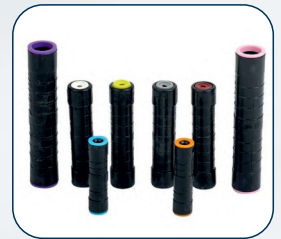
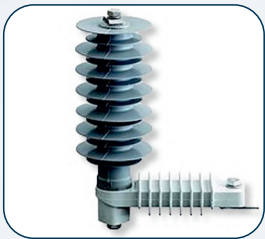
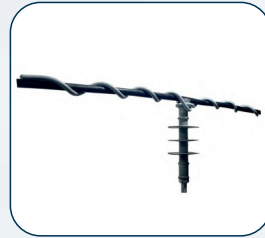
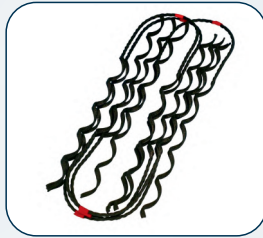
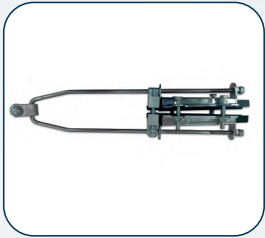
UV Resistant And Anti-tracking Properties of Covered Conductors

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.

Medium Voltage Covered Conductor Accessories

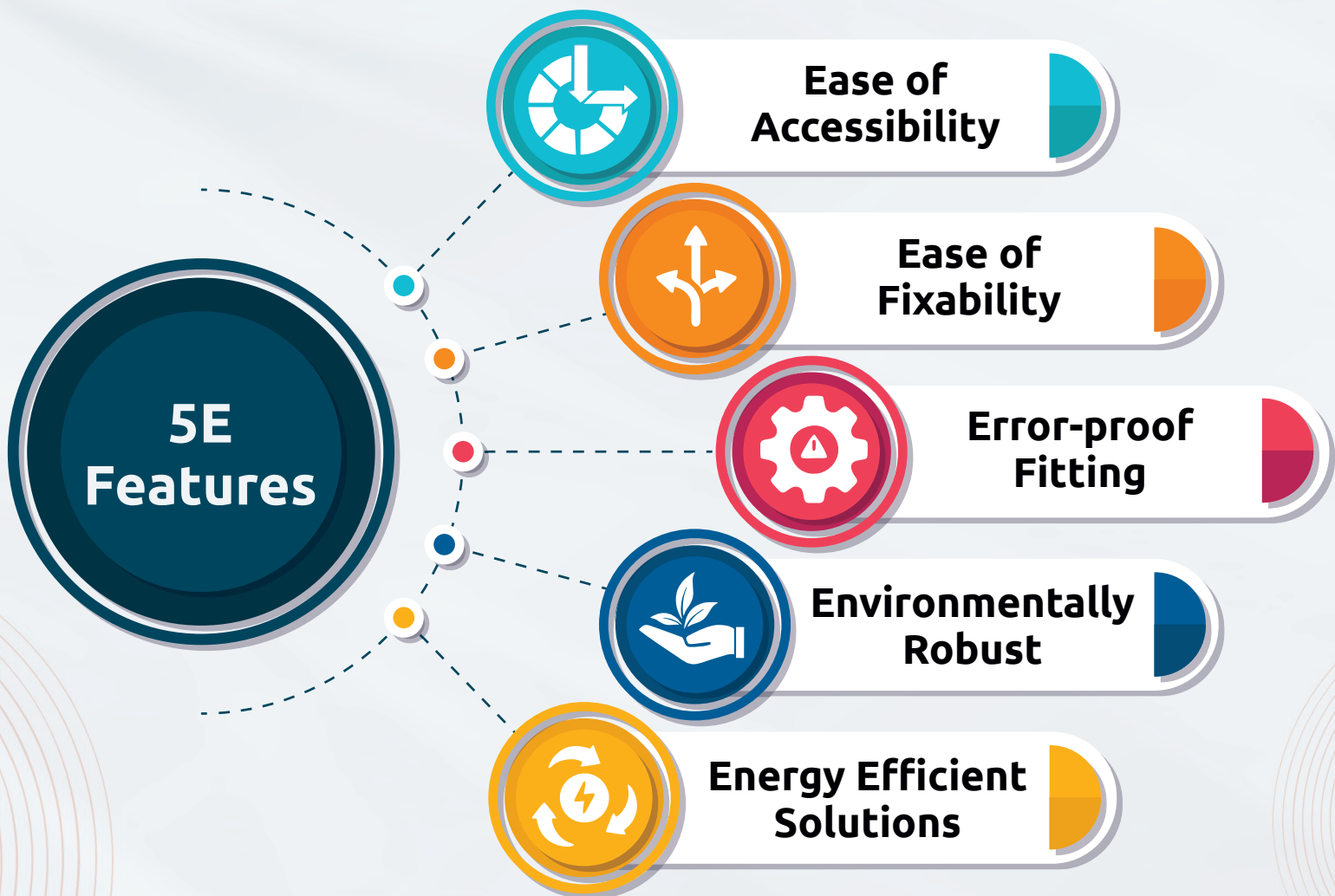


Sr. No.	Description	33kV	11kV
1	Tension /Dead End Clamp	✓	✓
2	Cable Tie for Pin Insulator	✓	✓
3	IPC for Cover to Cover	✓	✓
4	IPC for Cover to Bare	✓	✓
5	IPC for Bare to Bare	✓	✓
6	Mid Span Jointing Kit Ferrule	✓	✓
7	IPC for Al bail for Earthing	✓	✓
8	Lightning /Surge Arrester	✓	✓
9	Disc Insulator Polymer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

5E Features

Of

MVCC Accessories



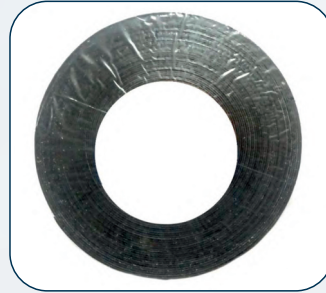
Heat Shrink High Voltage Tape



**Heat Shrink
Cable End Cap**



**Heat Shrink
High Voltage Tape**



**Heat Shrink
High Voltage Tape**



Rubber Tape

MVCC Lugs



Copper Lug



Copper Lug



Aluminium Lug



**Copper & Aluminium
Bi-Metallic Lug**



**Copper & Aluminium
Bi-Metallic Lugs**

Insulated Piercing Connector



**Double Bolt
IPC**



**Double Bolt
IPC**



**Double Bolt
IPC**



**Single Bolt
IPC**



**Double Bolt
IPC With Alm Bail**



**Single Bolt
IPC With Alm Bail**

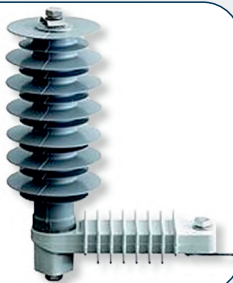


**Single Bolt
IPC**

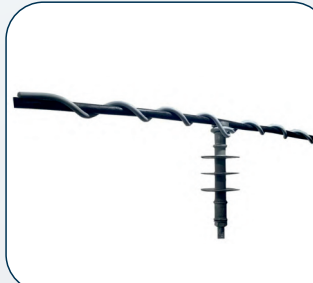


**Single Bolt
IPC**

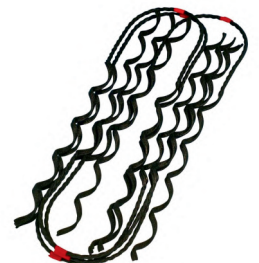
MVCC Surge Arrester



Surge Arrester



Polymer Cable Tie



Helical Tie

MVCC Tie

MVCC Insulator



**Composite line
Post Insulator**



**Composite line
Post Insulator**

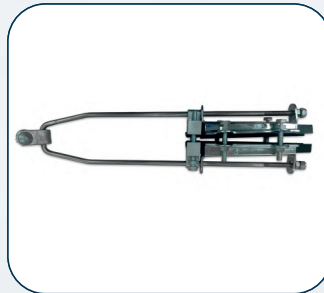


**Composite
Tension Insulator**

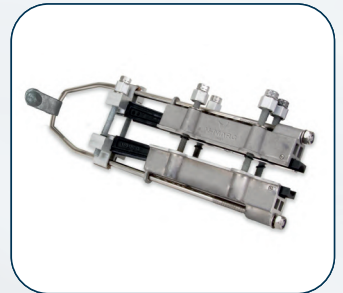
MVCC Tension Clamp



**Bracket Type
Tension Clamp
(Dead End)**



**Bracket Type
Tension Clamp
(Dead End)**



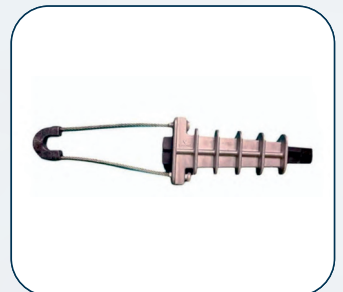
**Bracket Type
Tension Clamp
(Dead End)**



**Bracket Type
Tension Clamp
(Dead End)**



**Wedge Bracket
Type Tension
Clamp (Dead End)**



**Wedge Type
Tension Clamp
(Dead End)**

Anchoring Suspension Clamp



**Anchoring
Suspension Clamp**



**Anchoring
Suspension Clamp**



**Anchoring
Suspension Clamp**



**Anchoring
Suspension Clamp**



**Double Bolt
IPC With Alm Bail**



**Anchoring
Suspension Clamp**



**Anchoring
Suspension Clamp**



**Anchoring
Suspension Clamp**



**Anchoring
Suspension Clamp**



**Double Bolt
IPC**

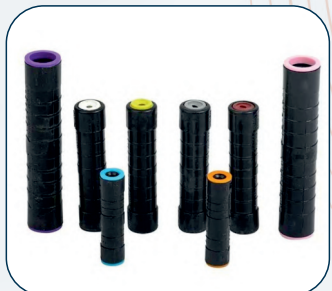
Mid Span Joint Kit



Mid Span Joint Kit



Mid Span Joint Kit



Mid Span Joint Kit

Our Presence



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