

# Product recommendations for traction vehicles

## PMA® Conduits fittings and accessories for traction vehicle applications



Improved performance and safety for the rail industry with PMA® cable protection solutions from ABB.

### On the carriage roof, on couplings and for intercar jumper connections

- **XPCSF:** PA12/PA12 - Heavy-duty, multilayer conduit for dynamic and static applications:
  - Excellent compression and impact strengths even at low temperatures and in dry conditions
  - Excellent flexibility and resistance to fatigue
  - Excellent ageing, weathering and UV resistance
  - Black outer layer, orange inner
  - Wear indicator
- **XPCS:** PA12/PA6 - Heavy-duty, multilayer conduit for dynamic and static applications:
  - Good compression and impact strengths even at low temperatures and dry conditions
  - Good flexibility and fatigue / reversed bending
  - Excellent ageing characteristics
  - Excellent weathering and UV resistance
  - Black outer layer, green inner layer
  - Wear indicator
- **JXPCSF:** Overextruded conduit with orange inner layer suitable for dynamic or static external applications:
  - Made from 2 layers of high-grade, specially formulated polyamide 12
  - Overextrusion: Made from high-grade, specially formulated polyamide 12
  - Excellent UV resistance and weathering characteristics
  - Excellent flexibility
  - Smooth outer layer prevents accumulation of ice

- Self-extinguishing
- Easy cleaning
- Temperature range -50°C ... +95°C continuous, +150°C short-term specifications
- High resistance to chemicals and cleaning agents

### Under carriages and on bogies

- **XVCSF** multilayer conduit with blue inner layer is suitable for use in static external rail applications:
  - Outer layer: specially formulated polyamide 6
  - Inner layer: specially modified polyamide 6
  - Excellent resistance to UV rays and weathering
  - Good flexibility
  - High compression and impact strengths at low temperature and low humidity
  - Self-extinguishing
  - Free from halogens and cadmium
  - Temperature range -50°C ... +105°C continuous, +160°C short-term specifications
- **XPCSF:** See characteristics above.
- **XPCS:** See characteristics above.
- **JXPCSF:** See characteristics above.
- **PHT:** PA6 Elastomer - Medium-duty conduit for dynamic and static applications:
  - Very good mechanical properties even at very low temperature applications below -40°C

### Inside carriages and in the passenger zone

- **VAM:** PA6 - Heavy-duty conduit preferably for static applications:
  - Comply with strictest international fire safety regulations regarding smoke and toxicity
- **VAML:** PA6 - Medium-duty conduit preferably for static applications:
  - Comply with strictest international fire safety regulations regarding smoke and toxicity
- **Braids:** Cable bundling and abrasion protection:
  - **F.66 / C.66 / L.66:** PA6.6
  - **F.PX / L.PX:** Polyester - Braids for bundling & protection of electric wires
  - **G.PX:** Polyester - Open, self rewinding construction for fast installation

### Underground railways

- **XPCSF:** See characteristics opposite.
- **POH:** Mod. polyolefin - Medium-duty conduit for static applications:
  - BS 6853 - certified category 1a int./ext.
- **VAML:** PA6 - Medium-duty conduit preferably for static applications:
  - EN 45545-2 - Certified category HL3 int./ext.

### Outdoor applications

e.g. for air conditioning systems, bogies, couplings, and intercarriage transition cables:

- **PMAFIX Pro KNH (straight) with metric thread, PMAFIX Pro KBH (90°) with metric thread, PMAFIX VNV (straight) with metric, PG or NPT thread and PMAFIX VBV (90°) with metric or PG thread** IP68 and IP69K fittings with metal threads for connecting conduits to bulkheads, casings, connectors etc. in outdoor applications with increased ingress protection requirements
- **PMAFIX Pro KNZ with metric thread and PMAFIX VNZ with metric or PG thread** IP68 and IP69 connectors with strain relief and metal thread for attaching conduits in moving systems and with increased ingress protection requirements between dry and wet areas

- **PMAFIX Pro KIS with metric thread, PMAFIX VIR with metric thread or VIZR with PG thread** IP68 and IP69 connectors with metal female thread for attaching to circular connectors or threaded steel tubes
- **MAVI with metric thread / MAVIK with metric thread** IP68 special / positioning elbow adapter made from nickel-plated aluminium for optimal loom configuration especially in moving systems
- **IP69 water impact protection ring WPS** for IP68 connectors in sizes NW10 to NW48 providing additional protection against high-pressure water jets

### Indoor applications

e.g. for passenger zone, driver's cab and general indoor application areas:

- **IP69 connectors** with polyamide or metal thread, metric for increased ingress protection requirements
- **IP68 connectors** with polyamide or metal thread, metric or PG for increased ingress protection requirements
- **IP66 connectors** with polyamide thread, metric, PG or NPT

**Fire Safety Certificates are available for many of these conduits according to EN45545, NF F 16 101/102, DIN 5510, BS 6853, NFPA 130, ASTM 162/662/1354.** Please contact the local PMA specialist or PMA, CH-8610 Uster for further application engineering support and advice on further alternatives. Use of grey products for the passenger zone may help to differentiate from products for outdoor applications where black is recommended. Multilayer conduits can be identified by their internal colour. For technical details and specifications please see our technical data sheets at [www.pma.ch](http://www.pma.ch)

**The fittings are made from self-extinguishing plastics which are free from halogens and cadmium.** For installations in areas with high levels of vibration, PMA recommends the use of a thread locking and sealing compound to prevent threads becoming loose during operation. Users of PMA products should make their own evaluation to determine the suitability of each product for a specific application. If PMA products are used in conjunction with non PMA products, all product liability claims will be rejected. Please contact the local PMA specialist or PMA, CH-8610 Uster for further application engineering support.

