Product recommendations for traction vehicles
PMA conduits, braids, fittings and accessories for traction vehicle applications

Conduits

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: Multilayer conduit with orange inner layer suitable for dynamic or static external applications:
  - Made from 2 layers of high-grade, specially formulated polyamide 12
  - Excellent UV resistance and weathering characteristics
  - Excellent flexibility
  - Self-extinguishing
  - Easy cleaning
  - High resistance to chemicals and cleaning agents
Under carriages and on bogies

- **XVCNF 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

Underground railways

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

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Braids

Cable bundling and abrasion protection

- **F.66 / C.66 / L.66**: PA6.6 Braids - Braids for bundling and protection of electrical wires
- **F.PX / L.PX**: Polyester - Braids for bundling and protection of electrical wires
- **G.PX**: Polyester - Open, self rewinding construction for fast installation
- **B.PX**: Polyester - High expansion ratio for wide application range

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Fittings

Outdoor applications

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

- **PMAFIX Pro KH (straight) with metric thread**, **PMAFIX Pro KBH (90°) with metric thread**, **PMAFIX VKN (straight) with metric, PG or NPT thread** and **PMAFIX VBV (90°) with metric or PG thread**
  - IP68 and IP69 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

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

- MAVI / MAVIK with metric thread: IP68 special / positioning elbow adapter made from nickel-plated aluminium for optimal loom configuration especially in moving systems
- WPS IP69 water impact protection for IP68 connectors in sizes NW10 to NW48 providing additional protection against high-pressure water jets
- SWA swivel adapters can be used to conduits from being exposed to torsion forces in dynamic applications

Fire Safety Certificates are available for the PMA conduits and fittings listed in this document according to various global standards. EN 45545-2, NFPA 130 (ASTM E162, ASTM-E662), ASTM1354, BSS 7239, SMP 800C, UL 94, NF F 16 101/102, DIN5510, BS 6853 etc. All materials are self-extinguishing, free from halogens and cadmium. PMA RoHS, REACH and Conflict minerals confirmation documents can be supplied on request.

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 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.

For technical details and specifications please see our technical data sheets at www.pma.ch

Please contact the local PMA specialist or PMA AG, CH-8610 Uster pma-conduitsystems@ch.abb.com for further application engineering support.

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