

# Product recommendations for machine building applications

PMA conduits, braids, fittings and accessories in machine building applications



PMA offers a very broad range of cable protection products:

- Special products for machine building applications
- Numerous worldwide approvals
- UL recognized and UL Listed products available
- Ingress Protection according to IEC 60529 IP66/IP68/IP69
- Extensive range of accessories
- Proven performance many years service in demanding applications

## In and on the machine

- **PCL:** PA6 - Medium-duty conduit for static and slightly dynamic applications
  - Very good UV resistance, weathering and ageing characteristics
  - Very good flexibility and resistance to fatigue
  - UL94 V2 flammability rating
  - UL Recognized
- **LLPA:** PA6 - Medium-duty conduit for static applications and those subjected to occasional movements
  - Very good flexibility and resistance to fatigue
  - UL94 V2 flammability rating
  - UL Recognized
- **LLPF:** PA6 - Medium-duty conduit for static applications and those subjected to occasional movements
  - Very good flexibility and resistance to fatigue
  - Very good fire safety characteristics
  - UL94 V0 flammability rating

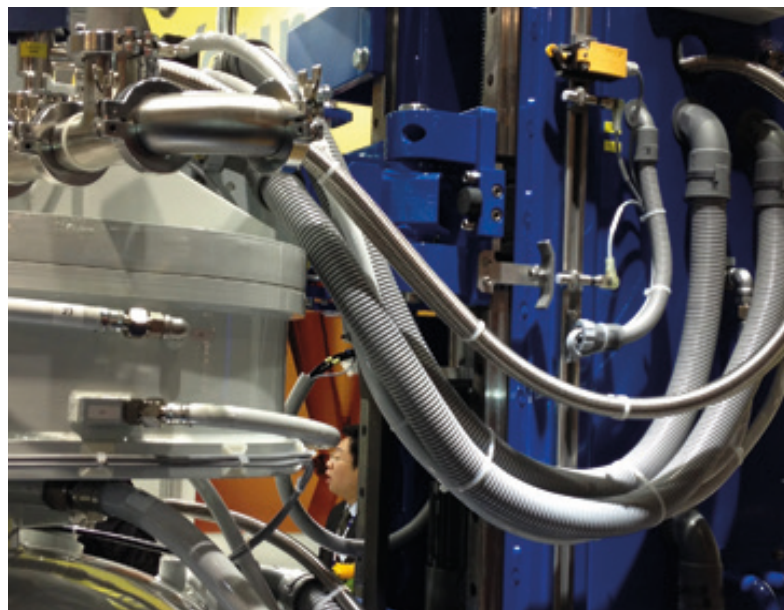
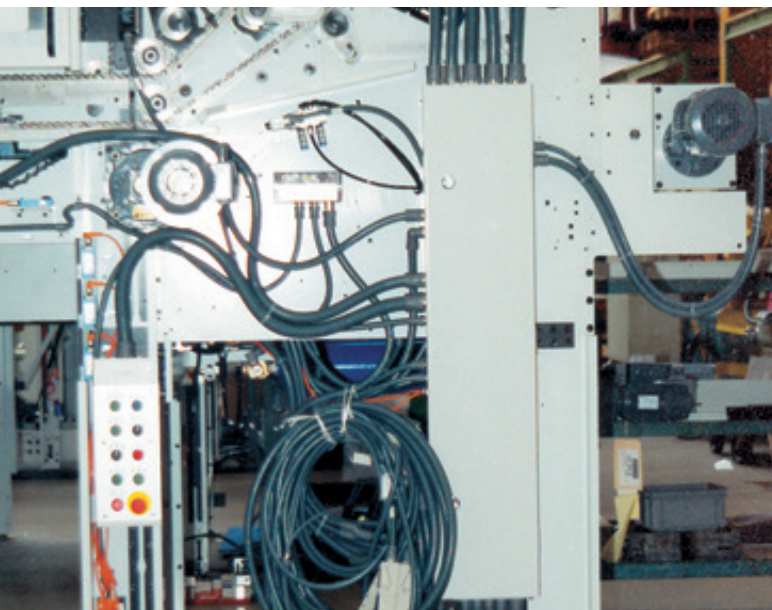
## To and from the machine

- **VCS:** PA6 - Heavy-duty conduit for static applications
  - Excellent compression and impact strengths under all climatic conditions
  - Good UV resistance, weathering and ageing characteristics (Black colour)
  - UL94 V2 flammability rating
  - UL Recognized (RU)

- **LLPA:** PA6 - Medium-duty conduit for static applications and those subjected to occasional movements
  - Very good flexibility and resistance to fatigue
  - UL94 V2 flammability rating
  - UL Recognized

## In and on the machine (automation/dynamic applications)

- **PIS/PIH:** PA12 - Heavy-duty monolayer conduit for dynamic, external applications
  - Excellent UV resistance, weathering and ageing characteristics (Black colour)
  - Excellent flexibility and resistance to fatigue
  - Good compression and impact strengths under all climatic conditions
  - UL94 V0 flammability rating
  - UL Recognized
- **XR90:** PA12 - Medium-duty conduit for highly dynamic applications
  - Excellent flexibility and resistance to fatigue
  - Very good resistance to abrasion/chafing
  - Integrated wear indicator
- **POS:** Polyolefin - Medium-duty conduit for applications subjected to continuous movements
  - Excellent flexibility and resistance to fatigue
  - -Very good resistance against strong acids



#### **Divisible System Conduits for retrofit and repairs**

- **PACOF:** PA6 - Medium-duty conduit preferably for static applications:
  - Can be opened and closed along their length at any time
  - Good compression strength
  - UL94 V0 flammability rating
  - Ingress protection to IP40
  - Compatible with PMA divisible fittings (BLNO), locknuts (BLN) but also with standard PMA Fittings allowing repairs using existing fittings
- **PPCOF:** PP - Medium-duty conduit preferably for static applications:
  - Can be opened and closed along their length at any time
  - Ingress protection to IP40
  - UL94 V2 flammability rating
  - Good chemical resistance characteristics
  - Compatible with PMA divisible fittings (BLNO), locknuts (BLN) but also with standard PMA Fittings allowing repairs using existing fittings

#### **Fittings**

Fittings for high requirements and standard applications

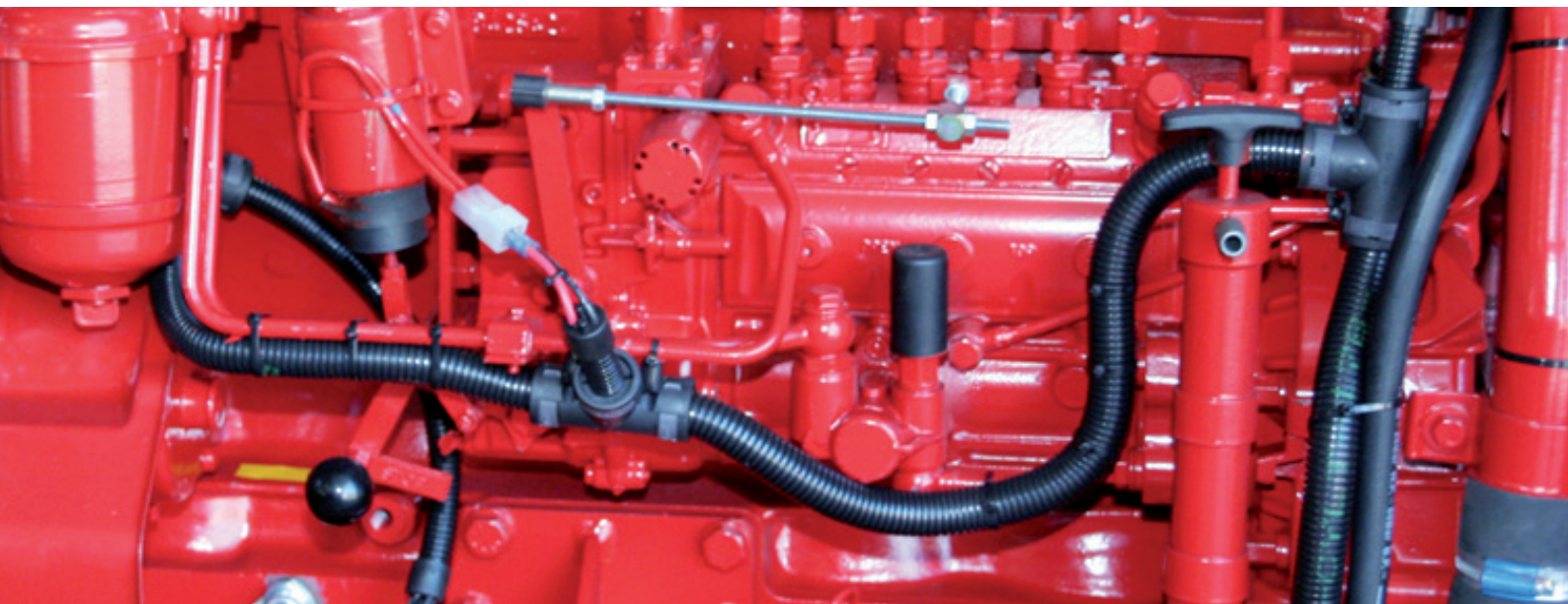
- **PMAFIX IP68** - Design ensures correct installation
  - Extremely wide range of fittings
  - Straight, 45°, 90° elbows
  - Male and female threads
  - Nickel plated brass or polyamide thread
  - Available with metric, PG, NPT, Gas, UNEF threads
  - Strain relief fittings also available
  - Available as single piece push-in component (GT)

- **PMAFIX IP66** - Simple push fit IP66 design
  - Extremely wide range of fittings
  - Straight, 45°, 90° elbows
  - Male and female threads
  - Polyamide thread
  - Available with metric, PG, NPT, Gas, UNEF threads
  - Strain relief fittings also available

#### **UL Listed cable protection products according to UL1660 & UL514B**

- **CUS:** PA6 - Medium-duty conduit for largely static applications or occasional movements
  - UL Listed to UL1660
  - Very good compression and impact strengths under all climatic conditions
  - Very good flexibility and resistance to fatigue
  - UL94 V2 flammability rating
- **PUS:** PA12 - Heavy-duty conduit for dynamic applications
  - UL Listed to UL1660
  - Very good compression and impact strengths under all climatic conditions
  - Excellent flexibility and resistance to fatigue
  - Excellent UV resistance, weathering and ageing characteristics (Black colour)
  - UL94 V2 flammability rating
- **PMAFIX Plus** - Proven fittings from the PMAFIX Plus series "UL Listed" according to UL514B for use with conduit listed according to UL1660
  - Polyamide threads
  - IP68 sealing according to IEC 60529
  - Straight, 45° & 90° elbows
  - Available with metric, PG and NPT threads





#### Conduit fixations

- **BGPM & BGPMR** - modular multiple conduit and cable clamping system
  - Flexible configuration for 1, 2, 3 or 4 conduits or cables of various size
- **BGPS** - one piece stackable robust conduit clamp
- **BGH, BGL, SGB, SGS** - Omega and P single conduit clamps

#### Accessories

- **Y** and **T**-junction elements are available to branch conduits in both the PMAFIX IP68 and PMAFIX IP66 series
- **SWA** swivel adapters can be used to relieve conduits from torsion forces in dynamic application
- **SCA** Positioning adapters can be used to adapt conduit exit angle
- **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

#### • Braids

##### Cable bundling and abrasion protection

Braids for bundling and abrasion protection of cables and wires

- **F.66: PA6.6**
  - Monofilament Ø 0.28 mm, optical coverage >90 %, highest abrasion resistance
- **C.66: PA6.6**
  - Monofilament Ø 0.28 mm, optical coverage >75 %, high abrasion resistance, flexible
- **L.66: PA6.6**
  - Monofilament Ø 0.25 mm, optical coverage >65 %, good abrasion resistance, highly flexible

All PA6.6 braids are UL94 V2 flammability rating

- **B.PX: Polyester**
  - Monofilament Ø 0.20 mm, optical coverage >50 %
  - Light braid with wide expansion range
  - Cables and wires can be fed out sideways
  - UL94 V0 flammability rating
- **G.PX: Polyester**
  - Mono- and Multifilament
  - Open construction, 90° overlapping, allows fast introduction of cables and wires from the side
  - Individual wires can be fed out from the side if necessary
  - UL94 V0 flammability rating

All PMA polyamide cable protection products demonstrate excellent resistance to oils, greases and other chemicals as well as the cleaning agents commonly used in the railway industry.

All PMA polyamide 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.

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 cable protection products from other companies all product liability claims will be rejected.

For technical details and specifications please see our technical data sheets at [www.pma.ch](http://www.pma.ch)

Please contact PMA for further application specific technical support

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