DNV·GL

Certificate No:
TAE00002DU

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Conduit, Fitting, Cable Pipe, Box, Etc.

with type designation(s)
VAM, VAML, VCS, VCSL, VOH, PCL, PLU, CYL, PCS, PCSL, PIS, PIH, PVD, LLPF, LLPA, EASIFLEX Cx, PMAFIX & SMART-LINE,

Issued to
ABB Switzerland Ltd., PMA Cable Protection
Uster, Switzerland

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2017-11-29**
This Certificate is valid until **2022-12-31**.
DNV GL local station: **Augsburg**

Approval Engineer: **Nicolay Horn**

for **DNV GL**

Andreas Kristoffersen
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Product description

Protection and support system for cables and wires comprising conduits and fittings.

Conduits:

Corrugated tubing of various colours made from either Polyamid 6 modified, Polyamid 12 modified, Polypropylen modified or PVD. Trade mark is PMAFLEX Pro, PMAFLEX, SMART-LINE and EASIFLEX.

Type	Sizes in mm Outer diameter	Remarks
VAM	10,0 to 146,5	Polyamid 6
VAML	10,0 to 146,5	Polyamid 6
VCS	10,0 to 146,5	Polyamid 6
VCSL	10,0 to 146,5	Polyamid 6
VOH	10,0 to 146,5	Polyamid 6
PCL	10,0 to 146,5	Polyamid 6
CYL	10,0 to 146,5	Polyamid 6
PCS	10,0 to 146,5	Polyamid 12
PCSL	10,0 to 146,5	Polyamid 12
PIS	10,0 to 54,2	Polyamid 12
PIH	67,2 to 146,5	Polyamid 12 (As PIS but thicker wall)
PLU	10,0 to 146,5	Polypropylen
PVD	10,0 to 146,5	PVD
LLPF	10,0 to 146,5	Polyamid 6
LLPA	10,0 to 146,5	Polyamid 6
EASIFLEX Cx	10,0 to 146,5	Polyamid 6

Connectors/Fittings:

Injection moulded fittings in various bodys such as straight, elbows, distributors, clips and others made of Polyamid 6 modified or Polyamide 12 modified. Trade mark is PMAFIX Pro, PMAFIX IP66, PMAFIX IP68 and SMART-LINE.

Type	Enclosure	Remarks
PMAFIX Pro	IP 69	Polyamid 6 modified
PMAFIX IP68	IP 68	Polyamid 6 modified
PMAFIX IP66	IP 66	Polyamid 6 modified
SMART-LINE	IP 66	Polyamid 6 modified

Application/limitation

Not for use through areas where water or gastightness is required. Nor through areas of different fire or hazardous zones.

For use as wire supporting and protection inside cabinets. The conduit must support the cables not vice versa.

When used outside cabinets, the conduit must give added protection to cables – not wires. Conduits with wires are not substitutes for cables.

When exposed to sunlight, Ultra-Violet resistant type must be specified.

Type Approval documentation

Tests carried out

Type tests in accordance with IEC 61386-1 & 22, UL 94 flame retardancy, UL 1660 UV exposure, chemical resistance, degree of protection in accordance with IEC 60529.

Marking of product

PMA - Type - Size - Ref. no.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at 2 and 3.5 years and at renewal.

END OF CERTIFICATE