



Philip Allington, Product Management, October 2016

UL Recognition CSA Approval

Non-metallic Mechanical Protection Tubing (NMPT) and Fittings

UL1696 2nd Edition – CSA C22.2 No.227.3.05 4th Edition



Power and productivity
for a better world™



UL 1696 – CSA C22.2 No.227.3.05 Bi-National Standard



CSA Group
CSA C22.2 No. 227.3-15
Fourth Edition



Underwriters Laboratories Inc.
UL 1696
Second Edition

Mechanical Protection Tubing (MPT) and Fittings

January 9, 2015

UL 1696 – CSA C22.2 No.227.3.05

Requirements for Approval

Section	Test Name	Procedure	Requirement	Products
6.2	Conditioning before testing	24 hrs @ 23°C +/-2°C, 50% relative humidity		Conduit & Fittings
6.3	Identification of Materials	Material composition recorded with Infrared Spectroscopy to ensure same material used in production as for the tests		Conduit & Fittings
6.4	Vertical Flame Test	15 secs flame - 15 secs recovery - 15 secs flame If UL94 V0 certified material used vertical flame test not necessary	Material must extinguish after second application within 60 secs	Conduit & Fittings
6.5	Tension	457mm Length of conduit pulled with 156 Newton force	No cracks or separation of Corrugations	Conduit Only
6.6	Flexibility	4 hrs -18°C Tubing to be wound arounds Mandrel of size related to NW. See table 2	No cracks or separation of Corrugations	Conduit Only
6.7	Cold Impact	4 hrs -18°C then 12.2 Joules Impact within 15 secs	No cracks or separation of Corrugations in more than 2 of 10 samples	Conduit Only
6.8	Weather Resistance (Optional for "Outdoor" classification)	1000 Hrs weathering cycles 102min Sunlight 18min Sunlight and water spray. Then repetition 6.6	No cracks or separation of Corrugations	Conduit Only
6.9	Flame test for Cable Trays (Optional for Cable Tray FT4 Classification)	FT4 flame test according to CSA C22.2 No 211.0		Conduit Only

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Requirements for Approval

Section	Test Name	Procedure	Requirement	Products
6.10	Pull-out Test	Force applied to Conduit - Fitting junction	80N NW17 and below 156N NW23 and above	System Test Conduit & Fittings
6.11	Heat Ageing for max temp. Ratings 50°C, 60°C, 80°C, 90°C, 105°C	Accelerated ageing for 168 hrs at a temp taken from table 3 related to the max quoted operating temp. 136°C Heat ageing temp. for 105°C rating No heat ageing procedure required for 50°C rating	No cracks or visible deterioration	Conduit Only
6.12	Liquid Tightness (Optional for Wet Zone Classification)	30 min Oil spray test to assembled Conduit and Fittings	No Oil entry to system	System Test Conduit & Fittings
6.13	Electrical resistance Test	30 Amp current	< 50mV Voltage drop at accessible metal parts Not Applicable for PMA Fittings Metal components not accessible after assembly	System Test Conduit & Fittings
7.1	Marking	MPT - Mechanical Protection Tubing	Manufacturer's Name, Trade Name or Trade Mark MPT-C Date of Manufacture, Manufacturing Code "Outdoors" if section 6.8 tested & fulfilled FT4 if section 6.9 tested & fulfilled Max Working Temp. Acc to heat ageing test 6.11	Conduit
		Fittings and Clamps	Manufacturer's Name, Trade Name or Trade Mark MPT-C Date of Manufacture, Manufacturing Code Liquid Tight for use with PMA MPT-C or For dry locations for use with PMA MPT-C	Fittings

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PMA UL Recognition File E80294

PMA has had a broad range of products tested to UL1696-CSA C22.2 No.227.3 at both UL and CSA

Tubing

▪ PIS/PIH	(NW12-NW125)	90°C	Outdoor use
▪ XSOL	(NW12-NW48)	90°C	Outdoor use
▪ CYL, PCL	(NW12-NW48)	105°C	Outdoor use
▪ VCS, LLPA	(NW12-NW95)	105°C	Outdoor use
▪ EASIFLEX CF	(NW12-NW95)	80°C	

Fittings and Accessories

▪ PMAFIX Pro	(NW12-NW48)	Wet locations
▪ PMAFIX IP68	(NW12-NW48)	Wet locations
▪ PMAFIX IP68 GT	(NW12-NW48)	Wet locations
▪ PMAFIX IP66	(NW12-NW48)	Dry locations
▪ PMAGRIP	(NW56-NW95)	Wet locations
▪ PMAGRIP	(NW125)	Dry locations

These products may carry the symbols



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PMA CSA Files – 088703 0 000 & 088712 0 000

CSA Certified

The PMA tubing types **PCL, CYL, PCS and LLPA** are CSA Certified according to the Bi-National standard in sizes NW12 – NW48 for use with PMAFIX IP68 and PMAFIX IP66 fittings with PG, Metric and NPT threads and may carry the CSA symbol

Optional, variable classifications

The PMA CSA Certified conduits are rated for a max operating temp of **105°C** (PA6) and **105°C** (PA12)

All PMA CSA certified fittings are approved for use in **Wet Locations**

All PMA CSA certified conduits are classified for **Outdoor Use**



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Comparison of files

UL Recognition - Application Ratings - Competitor Comparison

UL recognition is always given for specific combinations of tubing and fittings which have been tested together as a system.

Combination of a PMA UL Recognized conduit with a UL Recognized fitting from a competitor or vice versa are clearly not allowed and may if discovered by the UL inspector lead to difficulty with system approval.

A cable protection system with suitable characteristics for the application should be selected.

The [maximum operating temperature rating](#) should be considered

For applications where ingress protection is required a combination of tubing and fittings which is rated for [Wet Locations](#) should be selected.

For external applications exposed to high levels of UV and weathering a cable protection system with an [Outdoor Use](#) rating should be selected.

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Comparison of files

UL Product Directory

The information published about a specific product on the public access UL Directory is at the discretion of the manufacturer. Details such as Temperature, Wet Location and Outdoor Use Ratings are not mandatory. The limitations of usage may only be seen in the detailed Descriptive Report under Conditions of Acceptability

[UL Directory Search by File Number](#)

PMA File Number E80294

[UL Product Directory Search by Company Name, Product Type/Classification](#)

NMPT-C (Non-metallic Mechanical Protection Tubing & Fittings – Corrugated)
UL category code YDRQ2

The PMA Descriptive Reports including the Conditions of Acceptability are available on request from pma.conduitsystems@ch.abb.com

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