



## Flexicon

### Performance of Corrugated Nylon Conduit System and Low Fire Hazard (LFH)

Low Fire Hazard (LFH) conduit systems are becoming an increasing part of the specification in many applications.

Low Fire Hazard systems are required to protect personnel and property in the event of a fire and may be demanded by specifiers, occupiers, fire services or even insurers. Flexicon nylon conduit systems define a Low Fire Hazard product as having all of the following properties:

- **Highly Flame Retardant** to prevent a fire or limit its development if one does start.
- **Low Smoke** emission in the event of a fire to enable personnel to see their way to escape.
- **Low Toxicity** in the event of a fire to ensure personnel are not overcome during their escape.
- **Halogen Free** gives an indication of low smoke and low toxicity. It also rules out halogen acid gas emission—a fact that is of interest to insurers as acid smoke can destroy computer equipment and damage the structure of a building.

### Tests Used

- **Flame Retardancy** UL 94 is an Underwriters' Laboratories standard with flammability classifications HB, V2, V1, V0. A V2 rating indicates that a product is self-extinguishing, and V0 is highly flame retardant. Most Flexicon Nylon Conduit system products have a V2 rating or better—see across for details.
- **Smoke Density** is evaluated to BS6853 annex D.8.3, Code of practice for fire precautions in the design and construction of passenger trains. A plaque of materials is burnt in a 3 meter cubic chamber. A graph of smoke opacity against time is plotted which shows the maximum opacity (Ao) and the time taken to reach that opacity. LFH materials should have  $Ao < 0.03$ .
- **Toxic Fumes** British Naval standard NES713 burns a set amount of material and analyzes the gases given off. The volume of each gas is multiplied by the toxicity index for each gas. The toxicity index for each gas are added together to give an overall toxicity index of the material. LFH materials should have a toxicity maximum of 10.

#### Flexicon PA6 Conduit (Standard Weight—FPAS)

- Self Extinguishing
- Flame Retardant—UL 94V-2
- Low Smoke to BS6853—Maximum Opacity  $Ao = 0.02$
- Low Toxicity—Toxicity Index to NES713 = 10

#### Flexicon PA6 Conduit (Heavy Weight—FPAH)

- Self Extinguishing
- Flame Retardant—UL 94V-0 Annex B = 0.99
- Low Smoke to BS6853—Maximum Opacity  $Ao = 0.02$
- Low Toxicity—Toxicity Index to NES713 = 10

#### Flexicon PA6 Conduit (Extra Low Fire Hazard—FPR)

- Self Extinguishing
- Flame Retardant —UL 94V-0
- Low Smoke to BS6853—Maximum Opacity  $Ao = 0.03$
- Low Toxicity—Toxicity Index to BS6853 ANNEX B=0.99
- Ignition and fume rating to—NFF16-101/2 = 12F1

#### Flexicon PA6/6 Fittings (NPT, Metric or PG threads—IP 66 or IP 68)

- Self Extinguishing
- Flame Retardant—UL 94V-2
- Low Smoke to BS6853—Maximum Opacity  $Ao = 0.03$
- Low Toxicity—Toxicity Index to NES713 = 10



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## Performance of Corrugated Nylon Conduit System

### Tubing and Fittings–Ingress Protection

#### IP Ratings Guide (Ingress Protection to BS EN 60529)

- 1st digit-protection against solid objects**
- 0 No protection
  - 1 Protected against objects greater than 50 mm
  - 2 Protected against objects greater than 12 mm
  - 3 Protected against objects greater than 2.5 mm
  - 4 Protected against objects greater than 1.0 mm
  - 5 Ingress of dust is not totally prevented but dust does not enter in harmful quantities
  - 6 No ingress of dust—*All Flexicon Conduit Systems provide this level of protection when used with our fittings.*

#### 2nd digit-protection against water

- 0 No protection
- 1 Protected against falling drops
- 2 Protected against drops falling at 15°
- 3 Low pressure spray—similar to shower head at up to 60° from vertical
- 4 Low pressure spray—similar to shower head—from any angle
- 5 Medium pressure jet— similar to garden hose—from any angle
- 6 High pressure jet—similar to fire hose—from any angle  
*Standard Flexicon Conduit Systems provide this level of protection when used with our FPA fittings.*
- 7 Submersion at 1 meter for 30 minutes
- 8 High water pressure eg: 2 bar for 2 hours  
*Optional FPAX Flexicon Conduit Systems provide this level of protection—consult Heyco for availability*

### Conduit Fittings–Thread Data

#### Metric standard thread conforming to EN60423

Thread size	External thread outside diameter (mm)	Internal thread inside diameter (mm)	Pitch mm
M12	12.0	10.4	1.5
M16	16.0	14.4	1.5
M20	20.0	18.4	1.5
M25	25.0	23.4	1.5
M32	32.0	30.4	1.5
M40	40.0	38.4	1.5
M50	50.0	48.4	1.5
M63	63.0	61.4	1.5
M75	75.0	73.4	1.5

#### NPT American taper pipe thread conforming to ANSI/ASME B1.20.1–1983

Thread size (inches)	External thread outside diameter (mm)	Pitch mm
3/8	16.7	1.14
1/2	21.0	1.81
3/4	26.4	1.81
1	33.3	2.21
1-1/4	41.9	2.21
1-1/2	47.8	2.21
2	59.6	2.21

#### PG German standard thread conforming to DIN40430

Thread size	External thread outside diameter (mm)	Internal thread inside diameter (mm)	Pitch mm
PG7	12.5	11.3	1.27
PG9	15.2	13.9	1.41
PG11	18.6	17.3	1.41
PG13.5	20.4	19.1	1.41
PG16	22.5	21.2	1.41
PG21	28.3	26.8	1.59
PG29	37.0	35.5	1.59
PG36	47.0	45.5	1.59
PG42	54.0	52.5	1.59
PG48	59.3	57.8	1.59



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## Chemical Resistance Corrugated Nylon Nonmetallic Conduit and Fittings

** nylon PA12 corrugated, heavy weight <b>TYPE FPIH</b>	1-2 nylon PA12 corrugated, standard weight <b>TYPE FPI</b>	** nylon LFH PA6 corrugated, heavy weight <b>TYPE FPAH</b>	** nylon extra LFH PA6 corrugated, standard weight <b>TYPE FPR</b>	** nylon PA6 corrugated, light weight <b>TYPE FPAL</b>	1-1 nylon LFH PA6 corrugated, standard weight <b>TYPE FPAS</b>	Page number <b>CONDUIT SYSTEM</b>
X	X	X	X	X	X	ACETONE
X	X	X	X	X	X	BENZENE
X	X	X	X	X	X	CARBON TETRACHLORIDE
X	X	X	X	X	X	CITRIC ACID
X	X	X	X	X	X	DIESEL OIL
o	o	X	X	X	X	DIETHYLAMINE
o	o	X	X	X	X	ETHANOL
X	X	X	X	X	X	ETHER
o	o	X	X	X	X	ETHYLAMINE
X	X	X	X	X	X	ETHYLENE GLYCOL
X	X	X	X	X	X	FREON 32
X	X	X	X	X	X	LUBRICATING OIL
X	X	X	X	X	X	MEK
X	X	X	X	X	X	PARAFFIN OIL
X	X	X	X	X	X	PETROL
X	X	X	X	X	X	SEA WATER
X	X	X	X	X	X	SILVER NITRATE
X	X	X	X	X	X	SKYDROL
X	X	X	X	X	X	SODIUM CHLORIDE
X	X	X	X	X	X	SODIUM HYDROXIDE (10%)
o	o	X	X	X	X	SODIUM HYDROXIDE (60%)
X	X	X	X	X	X	TOLUENE
X	X	X	X	X	X	TRANSFORMER OIL
X	X	X	X	X	X	1,1,1-TRICHLOROETHANE
X	X	X	X	X	X	TURPENTINE
X	X	X	X	X	X	VEGETABLE OIL
X	X	X	X	X	X	WATER

### Design Characteristics

60	45	120	75	60	75	@ Compression Strength (KG/100MM)
50	30	70	40	30	40	@ Pull Off Strength (KG)
-50 to 110°C	-50 to 110°C	-40 to 120°C	-40 to 120°C	-40 to 120°C	-40 to 120°C	Temperature Range
35	30	45	35	35	40	Bend Radius (MM)

- o Provides limited resistance to this substance
- x Provides good resistance to this substance
- \*\* Consult factory for availability of these conduit types

@ Data intended to indicate relative strength and will vary across different sizes. Figures shown for 21 mm nominal size.