Page number	Conduit System		ASTM NO. 1	ASTM NO. 2	ASTM NO. 3	ACETIC ACID (10%)	ACETONE	ALUMINIUM CHLORIDE	BENZENE	CARBON TETRACHLORIDE	CHLOROFORM	CITRIC ACID	COPPER SULPHATE	CRESOL	DIESEL OIL	DIETHYLAMINE	ETHANOL	ETHER	ETHYLAMINE	ETHYLENE GLYCOL	FREON 32	HYDROCHLORIC ACID (10%)	HYDROCHLORIC ACID (30%)
44	**FPAS**	nylon LFH PA6 corrugated, std weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
44	**FPAL**	nylon PA6 corrugated, light weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
44	**FPAH**	nylon LFH PA6 corrugated, heavy weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
44	**FPASC**	nylon LFH PA6 corrugated, std weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
45	**FPR**	nylon extra LFH PA6 corrugated, std weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
45	**FPADS**	nylon PA6 double slit corrugated	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
45	**FPI**	nylon PA12 corrugated, standard weight	✓	✓	✓	L	✓	L	✓	✓	X	✓	L	X	✓	L	L	✓	L	✓	✓	X	X
45	**FPIH**	nylon PA12 corrugated, heavy weight	✓	✓	✓	L	✓	L	✓	✓	X	✓	L	X	✓	L	L	✓	L	✓	✓	X	X
45	**FPIHR**	nylon PA12 corrugated, heavy weight	✓	✓	✓	L	✓	L	✓	✓	X	✓	L	X	✓	L	L	✓	L	✓	✓	X	X
46	**FPP**	polypropylene corrugated, std weight	✓	✓	L	PP	✓	L	L	L	L	✓	L	X	✓	✓	✓	✓	✓	✓	✓	PP	PP
46	**FPP-NFR**	polypropylene corrugated non flame retarded	✓	✓	L	PP	✓	L	L	L	L	✓	L	X	✓	✓	✓	✓	✓	✓	✓	PP	PP
46	**FPP-H**	polypropylene corrugated heavy weight	✓	✓	L	PP	✓	L	L	L	L	✓	L	X	✓	✓	✓	✓	✓	✓	✓	PP	PP
70	**FPL**	upvc corrugated	✓	✓	✓	L	X	L	X	L	X	✓	L	X	✓	L	✓	✓	L	✓	L	X	X
72	**FPY**	nylon PA6 corrugated	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
72	**FPYS**	slit nylon PA6 corrugated, std weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
72	**FPYL**	nylon PA6 corrugated, light weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
72	**FPYLS**	slit nylon PA6 corrugated, light weight	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
78	**FPCB**	pvc spiral reinforced black	X	X	X	L	X	L	X	L	X	✓	L	X	L	L	X	L	L	L	L	X	X
78	**FPCG**	pvc spiral reinforced grey	X	X	X	L	X	L	X	L	X	✓	L	X	L	L	X	L	L	L	L	X	X
78	**FPCGN**	pvc spiral reinforced green oil resistant	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X
78	**FPCBU**	pvc spiral reinforced blue high temperature	X	X	X	L	X	L	X	L	X	✓	L	X	L	L	X	L	L	L	L	X	X
80	**LPCB**	smooth, pvc spiral reinforced	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X
80	**LPCO**	smooth pvc spiral orange ultra flexible	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X
80	**LPCBU**	smooth pvc spiral blue high temperature	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X
80	**LPCGN**	smooth pvc spiral green oil resistant	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X
84	**LPC-FG**	smooth, pvc spiral reinforced	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X

key

✓ good resistance
L limited resistance
PP suitable with polypropylene fittings
SS suitable with stainless steel fittings
X poor resistance

Non-Metallic conduit and fittings

Visit our website and use our conduit selector tool to see chemical resistance properties.

HYDROGEN PEROXIDE (30%)	HYDROGEN PEROXIDE (60%)	LACTIC ACID	LUBRICATING OIL	METHANOL	METHYL BROMIDE	MEK	NITRIC ACID (10%)	NITRIC ACID (60%)	OXALIC ACID	OZONE (GAS)	PARAFFIN OIL	PETROL	PHENOL	SEA WATER	SILVER NITRATE	SKYDROL	SODIUM CHLORIDE	SODIUM HYDROXIDE (10%)	SODIUM HYDROXIDE (60%)	SULPHUR DIOXIDE (GAS)	SULPHURIC ACID (10%)	TOLUENE	TRANSFORMER OIL	1,1,1-TRICHLOROETHANE	TRICHLOROETHYLENE	TURPENTINE	VEGETABLE OIL	VINYL ACETATE	WATER	WHITE SPIRIT	ZINC CHLORIDE	
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPAS**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPAL**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPAH**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPASC**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPR**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPADS**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	L	×	×	✓	✓	✓	×	✓	✓	L	✓	✓	×	**FPI**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	L	×	×	✓	✓	✓	×	✓	✓	L	✓	✓	×	**FPIH**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	L	×	×	✓	✓	✓	×	✓	✓	L	✓	✓	×	**FPIHR**
×	×	PP	✓	L	×	✓	PP	PP	PP	×	✓	✓	×	✓	✓	✓	✓	✓	✓	PP	PP	✓	✓	L	L	×	✓	L	✓	✓	×	**FPP**
×	×	PP	✓	L	×	✓	PP	PP	PP	×	✓	✓	×	✓	✓	✓	✓	✓	✓	PP	PP	✓	✓	L	L	×	✓	L	✓	✓	×	**FPP-NFR**
×	×	PP	✓	L	×	✓	PP	PP	PP	×	✓	✓	×	✓	✓	✓	✓	✓	✓	PP	PP	✓	✓	L	L	×	✓	L	✓	✓	×	**FPP-H**
×	×	L	✓	L	×	×	×	×	L	×	✓	✓	×	✓	✓	×	✓	✓	✓	×	×	×	✓	×	×	✓	✓	×	✓	✓	×	**FPL**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPY**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPYS**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPYL**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPYLS**
L	×	L	L	×	×	×	×	×	L	×	L	×	×	✓	✓	×	✓	✓	L	×	×	×	L	×	L	L	L	×	✓	L	×	**FPCB**
L	×	L	L	×	×	×	×	×	L	×	L	×	×	✓	✓	×	✓	✓	L	×	×	×	L	×	L	L	L	×	✓	L	×	**FPCG**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	✓	✓	×	✓	✓	✓	×	×	×	L	×	L	L	✓	×	✓	L	×	**FPCGN**
L	×	L	L	×	×	×	×	×	L	×	L	×	×	✓	✓	×	✓	✓	L	×	×	×	L	×	L	L	L	×	✓	L	×	**FPCBU**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	✓	✓	×	✓	✓	✓	×	SS	×	L	×	L	L	✓	×	✓	L	×	**LPCB**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	✓	✓	×	✓	✓	✓	×	SS	×	L	×	L	L	✓	×	✓	L	×	**LPCO**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	✓	✓	×	✓	✓	✓	×	SS	×	L	×	L	L	✓	×	✓	L	×	**LPCBU**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	✓	✓	×	✓	✓	✓	×	SS	×	L	×	L	L	✓	×	✓	L	×	**LPCGN**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	✓	✓	×	✓	✓	✓	×	SS	×	L	×	L	L	✓	×	✓	L	×	**LPC-FG**

The chart above is based on exposure to single chemicals at room temperature and should be used as a selection guide. For additional chemicals, higher concentrations, elevated temperatures or combinations of chemicals, please call +44 (0)1675 466900 for technical advice.

Page number	Conduit System		ASTM NO. 1	ASTM NO. 2	ASTM NO. 3	ACETIC ACID (10%)	ACETONE	ALUMINIUM CHLORIDE	BENZENE	CARBON TETRACHLORIDE	CHLOROFORM	CITRIC ACID	COPPER SULPHATE	CRESOL	DIESEL OIL	DIETHYLAMINE	ETHANOL	ETHER	ETHYLAMINE	ETHYLENE GLYCOL	FREON 32	HYDROCHLORIC ACID (10%)	HYDROCHLORIC ACID (30%)
92	FU	galvanised steel	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
92	SSU	stainless steel, grade 316	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
94	FSU	galvanised steel, pvc coated	X	X	X	L	X	X	X	X	X	✓	✓	L	L	X	X	X	X	L	L	✓	X
94	FNU	galvanised steel, nylon coated	✓	✓	✓	L	✓	X	L	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
96	LFHU	galvanised steel, LFH coated	L	L	L	✓	X	X	X	X	X	✓	✓	X	X	✓	X	X	X	✓	X	X	X
96	FPU	galvanised steel, polyurethane coated	✓	✓	✓	X	L	L	L	L	X	✓	✓	X	✓	L	✓	L	X	✓	X	X	X
98	LTP	galv steel, pvc coated, liquid tight	L	L	L	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
98	LTPAS	galv steel, pvc coated, liquid tight	L	L	L	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
98	LTPHC	galv steel, thermoplastic rubber, liquid tight	✓	L	L	✓	✓	X	X	L	L	✓	✓	✓	✓	✓	✓	✓	L	✓	X	✓	✓
98	LTPLFH	galv steel, LFH coated, liquid tight	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
99	LTPUL	galv steel, PVC coated, liquid tight	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
99	LTPPU	galv steel, polyurethane coated, liquid tight	✓	✓	✓	X	L	L	L	L	X	✓	✓	X	✓	L	✓	L	X	✓	X	X	X
99	LTPPUAS	galv steel, polyurethane coated, liquid tight	✓	✓	✓	X	L	L	L	L	X	✓	✓	X	✓	L	✓	L	X	✓	X	X	X
99	LTPSS	stainless steel, pvc coated, liquid tight	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
100	LTBRDP	galv steel, braided core, pvc coated, liquid tight	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
100	LTBRDLFH	galv steel, braided core, LFH coated, liquid tight	L	L	L	✓	X	X	X	X	X	✓	✓	X	L	✓	X	X	X	✓	X	X	X
110	LTPBRD	galv steel, rubber coated, SS316 overbraid	✓	L	L	✓	✓	X	X	L	L	✓	✓	✓	✓	✓	✓	✓	L	✓	X	✓	✓
112	LTP-FG	galv steel, pvc coated, liquid tight	L	L	L	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
112	LTBRDP-FG	galv steel, pvc coated, liquid tight	L	L	L	✓	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	L	X
112	LTPSS-FG	stainless steel, pvc coated, liquid tight	✓	✓	✓	✓	X	X	X	L	X	✓	✓	L	✓	L	X	L	L	L	L	L	X
114	FL	galvanised steel, pliable	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
115	FLP	galvanised steel, pvc coated, pliable	X	X	X	L	X	X	X	L	X	✓	✓	L	L	L	X	L	L	L	L	✓	L
116	LFHP	galvanised steel, LFH coated, pliable	L	L	L	✓	X	X	X	X	X	✓	✓	X	X	✓	X	X	X	✓	X	X	X
116	FB	galvanised steel, galv steel overbraid	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
118	FUSSB	galvanised steel, SS316 overbraid	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
118	FSB	galv steel, pvc, galv steel overbraid	X	X	X	L	X	X	X	X	X	✓	✓	L	L	X	X	X	X	L	L	✓	X
120	LFHUBRD	galv steel, LFH coated, SS316 overbraid	L	L	L	✓	X	X	X	X	X	✓	✓	X	X	✓	X	X	X	✓	X	X	X
120	FSS	stainless steel corrugated	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
122	FSSBRD	stainless steel corrugated, overbraid	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
122	FPRSS	PA6 corrugated, SS316 overbraid	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	✓	✓	X	X
122	FPRTC	PA6 corrugated, tinned copper overbraid	✓	✓	✓	L	✓	X	✓	✓	X	✓	L	X	✓	✓	✓	✓	✓	X	X	X	X
122	FPISS	PA12 corrugated, SS316 overbraid	✓	✓	✓	L	✓	L	✓	✓	X	✓	L	X	✓	L	L	✓	L	✓	✓	X	X
122	FPIHSS	PA12 corrugated, SS316 overbraid	✓	✓	✓	L	✓	L	✓	✓	X	✓	L	X	✓	L	L	✓	L	✓	✓	X	X
122	FPIHRSS	PA12 corrugated, SS316 overbraid	✓	✓	✓	L	✓	L	✓	✓	X	✓	L	X	✓	L	L	✓	L	✓	✓	X	X

key

✓ good resistance
L limited resistance
X poor resistance
PP suitable with polypropylene fittings
SS suitable with stainless steel fittings

Metallic conduit and fittings

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NEW

HYDROGEN PEROXIDE (30%)	HYDROGEN PEROXIDE (60%)	LACTIC ACID	LUBRICATING OIL	METHANOL	METHYL BROMIDE	MEK	NITRIC ACID (10%)	NITRIC ACID (60%)	OXALIC ACID	OZONE (GAS)	PARAFFIN OIL	PETROL	PHENOL	SEA WATER	SILVER NITRATE	SKYDROL	SODIUM CHLORIDE	SODIUM HYDROXIDE (10%)	SODIUM HYDROXIDE (60%)	SULPHUR DIOXIDE (GAS)	SULPHURIC ACID (10%)	TOLUENE	TRANSFORMER OIL	1,1,1-TRICHLOROETHANE	TRICHLOROETHYLENE	TURPENTINE	VEGETABLE OIL	VINYL ACETATE	WATER	WHITE SPIRIT	ZINC CHLORIDE	
×	×	×	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	×	×	✓	×	×	×	×	×	✓	✓	×	×	✓	✓	×	×	✓	×	**FU**
✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	SS	✓	✓	SS	✓	L	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**SSU**
✓	✓	L	L	×	×	×	✓	✓	×	L	L	×	×	×	✓	×	×	✓	L	×	×	×	L	×	×	L	L	×	✓	L	✓	**FSU**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	×	✓	✓	×	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FNU**
×	×	✓	L	×	×	×	✓	×	✓	✓	×	×	×	×	✓	×	✓	✓	✓	×	×	L	L	L	L	×	L	×	✓	×	✓	**LFHU**
L	×	L	L	L	×	L	×	×	L	L	L	✓	×	×	L	×	✓	L	×	L	L	×	L	×	×	×	✓	×	✓	L	L	**FPU**
L	×	L	✓	×	×	L	L	×	✓	L	×	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTP**
L	×	L	✓	×	×	L	L	×	✓	L	×	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTPAS**
L	×	L	L	✓	L	✓	✓	✓	✓	L	✓	✓	✓	SS	✓	✓	SS	✓	×	✓	SS	×	×	L	×	×	✓	✓	✓	×	✓	**LTPHC**
L	×	L	L	×	×	×	L	×	✓	L	L	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	L	×	✓	L	×	**LTPLFH**
L	×	L	✓	×	×	×	L	×	✓	L	✓	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTPUL**
L	×	L	L	L	×	L	×	×	L	L	L	✓	×	SS	L	×	✓	L	×	L	L	×	L	×	×	×	✓	×	✓	L	L	**LTPPU**
L	×	L	L	L	×	L	×	×	L	L	L	✓	×	SS	L	×	✓	L	×	L	L	×	L	×	×	×	✓	×	✓	L	L	**LTPPUAS**
L	×	L	✓	×	×	×	L	×	✓	L	✓	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTPSS**
L	×	L	✓	×	×	L	L	×	✓	L	✓	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTBRDP**
×	×	✓	L	×	×	×	✓	×	✓	✓	×	L	×	SS	✓	×	✓	✓	✓	×	×	L	L	L	L	×	L	×	✓	×	✓	**LTBRDLFH**
L	×	L	L	✓	L	✓	✓	✓	✓	L	✓	✓	✓	L	✓	✓	SS	✓	×	✓	SS	×	×	L	×	×	✓	✓	✓	×	✓	**LTPBRD**
L	×	L	✓	×	×	L	L	×	✓	L	×	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTP-FG**
L	×	L	✓	×	×	L	L	×	✓	L	×	L	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTBRDP-FG**
L	×	L	✓	×	×	×	L	×	✓	L	✓	✓	L	SS	✓	×	SS	✓	✓	×	SS	×	L	×	×	L	✓	×	✓	L	×	**LTPSS-FG**
×	×	×	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	×	×	✓	×	×	×	×	×	✓	✓	×	×	✓	✓	×	×	✓	×	**FL**
✓	✓	L	L	×	×	×	✓	✓	L	L	L	×	L	L	✓	×	L	✓	L	×	×	×	L	×	×	L	L	×	✓	L	✓	**FLP**
×	×	✓	L	×	×	×	✓	×	✓	✓	×	×	×	L	✓	×	✓	✓	✓	×	×	L	L	L	L	×	L	×	✓	×	✓	**LFHP**
×	×	×	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	×	×	✓	×	×	×	×	×	✓	✓	×	×	✓	✓	×	×	✓	×	**FB**
×	×	×	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	×	×	✓	×	×	×	×	×	✓	✓	×	×	✓	✓	×	×	✓	×	**FUSSB**
×	×	×	L	×	×	×	×	×	×	×	L	×	×	×	×	×	×	×	×	×	×	×	L	×	×	L	L	×	×	L	×	**FSB**
×	×	✓	L	×	×	×	✓	×	✓	✓	×	×	×	×	✓	×	✓	✓	✓	×	×	L	L	L	L	×	L	×	✓	×	✓	**LFHUBRD**
✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	SS	✓	✓	SS	✓	L	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**FSS**
✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	SS	✓	✓	SS	✓	L	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**FSSBRD**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	L	✓	✓	✓	✓	✓	×	×	✓	✓	✓	L	✓	✓	L	✓	✓	×	**FPRSS**
×	×	×	✓	L	×	✓	×	×	×	×	✓	✓	×	×	×	×	×	×	×	×	×	✓	✓	×	L	✓	×	L	✓	✓	×	**FPRTC**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	L	✓	✓	✓	✓	L	×	×	✓	✓	✓	×	✓	✓	L	✓	✓	×	**FPISS**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	L	✓	✓	✓	✓	L	×	×	✓	✓	✓	×	✓	✓	L	✓	✓	×	**FPIHSS**
×	×	L	✓	L	×	✓	×	×	L	×	✓	✓	×	L	✓	✓	✓	✓	L	×	×	✓	✓	✓	×	✓	✓	L	✓	✓	×	**FPIHRSS**

The chart above is based on exposure to single chemicals at room temperature and should be used as a selection guide. For additional chemicals, higher concentrations, elevated temperatures or combinations of chemicals, please call +44 (0)1675 466900 for technical advice.

Thread Data and Cable Carrying Capacity

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

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

NPT

American taper pipe thread conforming to ANS/ASME B1.20.1 - 1983

Thread size (inches)	External thread max outside diameter (mm)	Pitch mm
⅜"	17.4	1.14
½"	21.5	1.81
¾"	27.0	1.81
1"	33.6	2.21
1¼"	42.3	2.21
1½"	48.5	2.21
2"	60.6	2.21

PF / gas

Japanese conduit thread conforming to JIS B 0202

Thread size (inches)	External thread outside diameter (mm)	Internal thread inside diameter (mm)	Pitch mm
½"	21.0	18.6	1.81
¾"	26.4	24.1	1.81
1"	33.3	30.3	2.31
1¼"	41.9	39.0	2.31
1½"	47.8	44.8	2.31
2"	59.6	56.7	2.31

UNEF / UNS / UN

American unified thread conforming to BS1580 used on circular connectors

UNEF Imperial sizes	Thread size (inches)	External thread outside diameter (mm)	Internal thread inside diameter (mm)	Pitch mm
⅝" - 24 UNEF	⅝"	15.9	14.7	1.06
¾" - 20 UNEF	¾"	19.1	17.7	1.27
⅞" - 20 UNEF	⅞"	22.2	20.9	1.27
1" - 20 UNEF	1"	25.4	24.0	1.27
1⅜" - 18 UNEF	1⅜"	30.2	28.6	1.41
1¼" - 18 UNEF	1¼"	31.8	30.2	1.41
1⅜" - 18 UNEF	1⅜"	34.9	33.4	1.41
1⅛" - 18 UNEF	1⅛"	36.5	35.0	1.41
1¾" - 18 UNS	1¾"	44.5	42.9	1.41
2" - 18 UNS	2"	50.8	49.3	1.41
2¼" - 18 UN	2¼"	57.2	55.4	1.41

Cable carrying capacity

UK wiring regulations BS7671, recommend that the total cross sectional area of the sum of the individual cables should not exceed 40% of the cross sectional area of the conduit. The nominal cross sectional area of single-core, stranded, PVC insulated cables is provided as a guide only. Other cables may have different dimensions.

Nominal conductor size (mm^2)	Nominal overall cross sectional area (mm^2) of cable
1.0	6.6
1.5	7.6
2.5	9.6
4.0	14.5
6.0	18.8
10.0	29.3
16.0	40.2
25.0	63.8
35.0	83.5
50.0	113.0
70.0	149.0
95.0	204.0

Example: is LTP20 suitable for five 4.0mm^2 cables?

- The total cross sectional area of the conductors is 5 x 14.5mm^2 = 73mm^2
- The cross sectional area of LTP20 is 3.142 x $\left[\frac{\text{inside diameter}}{2}\right]^2$ = 201mm^2
- % of conduit cross sectional area $\frac{73}{201}$ = 36%

This is less than 40%; therefore this conduit is suitable for this combination of cables.

UK wiring regulations

UK wiring regulations BS7671 prohibit the use of flexible or pliable conduit as an earthing conductor.

Where conduits of 40mm and above penetrate fire barriers in buildings the wiring regulations stipulate that internal seals should be used to maintain fire resistance.

To meet the UK wiring regulations conduit should be self extinguishing unless they are to be buried or contained in non combustible material e.g: concrete or plaster.

Please telephone the Flexicon hotline for further guidance, +44 (0)1675 466900.

IP Rating and Technical Guidance

IP ratings guide

(Ingress Protection to BS EN IEC 60529)

IP40

1st digit – protection against solid objects

0	No protection
1	Protected against objects greater than 50mm
2	Protected against objects greater than 12mm
3	Protected against objects greater than 2.5mm
4	Protected against objects greater than 1.0mm
5	Ingress of dust is not totally prevented but dust does not enter in harmful quantities
6	No ingress of dust

IP40

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 - up to 60° from vertical
4	Low pressure spray – similar to shower head – from any angle for 5 minutes
5	Medium pressure jet – similar to garden hose – from any angle for 3 minutes
6	High pressure jet – similar to fire hose – from any angle for 3 minutes
7	Submersion at 1 metre for 30 minutes
8	Higher water pressure eg: 2 bar for 2 hours. Conduits are tested in-house at up to 10 bar. (equivalent to 100m underwater)
9	Steam clean, high pressure high temp jet wash

Buyer Beware

IP tests are type tests of short duration and do not guarantee long term performance. EN 60529 states that equipment conforming to IP67 or IP68 cannot be assumed to meet IP66 and that the manufacturer shall declare the pressure and duration of the test, for example, FPAX 2 bar for 2 hours.

Technical guidance

Application advice

Flexicon can offer impartial advice on which of our wide range of conduit systems are most suited to your application. Factors which may be important include:-

Standards, performance and approvals

Flexicon conduits and fittings are manufactured by Flexicon to comply with the IEC and European conduit standard BS EN IEC 61386 - see classification table below.

Certain tests are carried out internally by Flexicon, other testing is carried out externally by accredited test laboratories. Specific test reports are available upon request.

Vibration and shock testing to EN61373 Cat 2.

Certain conduit systems have been tested and approved to the relevant parts of the Australian Standard AS/NZS 2053:3 2001. Where product performance data over and above the requirements of BS EN IEC 61386 is provided e.g: Low Fire Hazard testing and EMC screening, other appropriate standards have been used.

Cable glands are manufactured to EN 50262.

- Compression strength
- Tensile strength
- Impact strength
- Temperature range
- Flexibility
- Fatigue life
- Electrical insulation or continuity
- IP rating
- Chemical resistance
- Corrosion resistance
- Abrasion resistance
- UV resistance
- Anti vibration
- Fire performance
- EMC screening
- Dimensions
- Weight

Classification of conduit systems to BS EN IEC 61386

Level	1st digit Compression Strength N/50mm	2nd digit Impact Strength Joules at min temp	3rd digit Minimum Temp deg C	4th digit Maximum Temp deg C	5th digit Conduit Type	6th digit Electrical Properties	7th digit IP Rating Solids	8th digit IP Rating Water	9th digit Corrosion Resistance (water)	10th digit Tensile Strength N	11th digit Flame Propagation	12th digit Suspended Load N/48hr
0						None declared		0	None declared	None declared		
1	V. Light (125)	V. Light (0.5)	5	60	Rigid	Continuous		1	Low in & out	V. Light (100)	Non Flame Propagating	V. Light (20)
2	Light (320)	Light (1)	-5	90	Pliable	Insulating		2	Medium in & out	Light (250)	Flame Propagating	Light (30)
3	Medium (750)	Medium (2)	-15	105	Pliable self recoving	Continuous + Insulating	3	3	Medium in & high out	Medium (500)		Medium (150)
4	Heavy (1250)	Heavy (6)	-25	120	Flexible		4	4	High in & out	Heavy (1000)		Heavy (450)
5	V. Heavy (4000)	V. Heavy (20)	-45	150			5	5		V. Heavy (2500)		V. Heavy (850)
6				250			6	6				
7				400				7				

Cutting Conduit

Non-Metallic

Non-metallic conduits to 34mm can be easily cut with Flexicon Conduit Cutters, part no. CC01. Use CC02 for sizes up to 67mm. Drop the blade into a corrugation and squeeze and twist until conduit is cut 50% through. Cut the remaining 50% without twisting to achieve a square cut.

Metallic

Metallic conduits should be cut with a fine tooth (32 TPI) hacksaw or bandsaw. Ensure you make a straight vertical cut. Our clamping vice, part no. BSB makes the use of a hacksaw much easier.

Overbraided

Cutting of overbraided conduit is made much easier by tightly wrapping self adhesive tape around the conduit and sawing through the middle of the tape. The tape should be removed after cutting if EMC screening is required. Ensure you make a straight vertical cut.

Note: Conduit length is measured under light tension. When cutting an exact number of lengths from a reel (e.g. 5 x 5m from 25m) please take into account the length tolerance of the reel and each cut length.

Non-Metallic Fittings

FPA & Ultra™ Fitting

Our range of non-metallic conduit fittings, Flexicon Ultra™, Flexilok®, FPA and FPAX are all push fit fittings which are quick to assemble once you have cut the conduit to length.

FPA & Ultra™

For Ultra™, Flexilok® and FPA fittings simply push the conduit into the end of the fitting with a slight twist until it will go no further. Pull back slightly to ensure the locking teeth mechanism has engaged with the corrugations.

FPAX

The FPAX fitting features a conduit seal to provide an IP rating up to IP69. This simply fits onto the end of the conduit before the fitting is connected to the conduit. To aid assembly moisten this seal. For a one piece fitting with an IP69 rating use Ultra™ (An FPA fitting cannot be uprated to IP69 with the addition of a seal). Pull back slightly to ensure the locking teeth mechanism has engaged with the corrugations.

To remove the Ultra™, FPA or FPAX fittings simply insert a small screwdriver into the screwdriver slot and move the screwdriver handle towards the "off" position. Remove the screwdriver then manually twist the cap further towards the off position - the fitting can then be released from the conduit. Once removed, the fitting can be reused by simply twisting the cap so that the screwdriver slot lines up with the ON position.

WATCH THE VIDEO

Metallic Fittings

FSU Conduit

Our fitting's components are supplied part assembled to illustrate how they go together. Our C type fittings consist of a compression nut, an elastomeric seal, an insert and a body.

Insert being fitted

Firstly place the back nut on the conduit followed by the seal (note the orientation). Next, screw the insert into the end of the conduit until this gives a secure fit.

Attaching the body

Bring the body to mate with the back nut. Metal fittings should be tightened with grips or spanner to ensure security and IP rating.

EMC Screening Performance

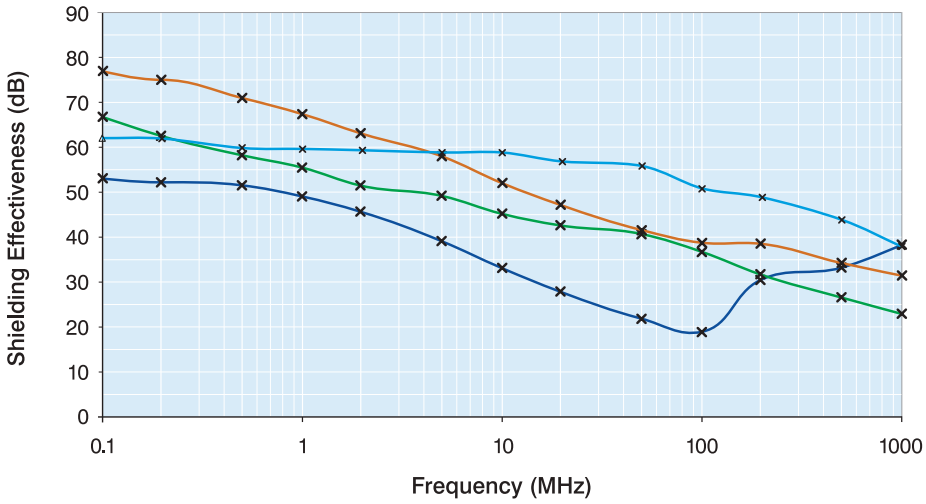
EMC Screening Using Pliable Conduit

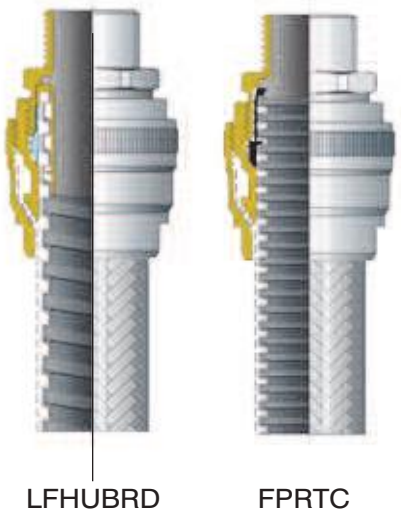
FLP conduit with sheath trimmed back

To obtain EMC screening on pliable FLP conduit, the outer plastic sheath must be trimmed back prior to assembly of the fitting to ensure good electrical contact with the tapered bore of the fitting body as shown

Flexicon has classified EMC screening of our products as follows;		
STANDARD EMC SCREEN ★	ENHANCED EMC SCREEN ★★	SUPER EMC SCREEN ★★★
Standard 50dB @ IMHz	Enhanced 60dB @ IMHz	Super 70dB @ IMHz

Braid Material		Part number
Galv Steel		LTBRDP, LTBRDP-FG, LTBRDLFH
Galv Steel		FB
Stainless Steel		LFHUBRD, FUSSB, FPRSS, FPISS, FPIHSS, FPIHRSS, FSSBRD
Tinned Copper		FPRTC, FTCB





Braided Fittings - Installation

Type C Braided Fittings

Our type-C braided fittings consist of an outer compression nut, an inner compression nut, an elastomeric seal, an insert and a body. Firstly place the outer compression nut on the conduit as per 1. Remove the tape securing the braid and pull back to allow the inner compression nut to be fitted as per 2. Next, fit the elastomeric seal (note the orientation) and screw the insert into the end of the conduit until this gives a secure fit as per 3.

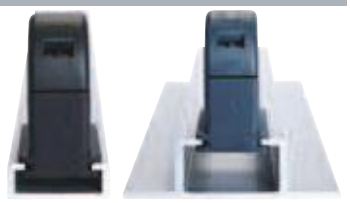
Bring the body to mate with the inner compression nut and secure. Next, bring the back shell to mate with the inner compression nut to secure the braid as per 4. Metal fittings should be tightened with grips or spanner to ensure securing and IP rating as per 5.

Conduit Mounting Options

Conduit Clips and Mounting Channel

Clip Mounting

Clips can be secured using the fixing hole in the base of the clip.

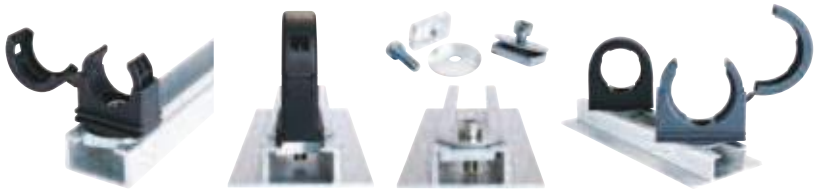


Clips can be located by sliding into the end of the channel. To install, slide the FCL clip in from the end of the channel.

The FCL clips have been designed to easily fit within the channel.

A choice of fixing options are available to securely fasten the FCL clip within or to the channel.

Fixing Conduit

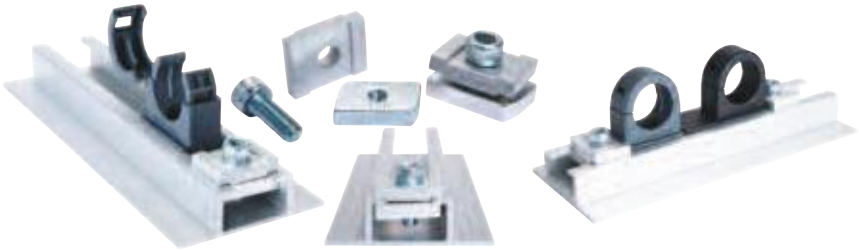


Conduit clips can be mounted directly onto the channel using the FCL Mount Kit.

This allows new clips to be added and positioned at any point along the channel without the need to access the ends using the FCL Mount Kit. Ideal for when a channel system is already populated, installed or access to the end of the channel is restricted.

This method of mounting enables the FCL clip to be rotated to your desired angle to suit the required routing of the conduit system.

End Stop



Slide the FCL or FCL-P clip in from the end of the channel rail. Move the clips into the desired position and use the End Stop to secure.

The **ES** can be inserted from above at any given position, or alternatively from the end of the rail if accessible.

Secure its position using the bolt. Tighten the bolt until secure. Note the orientation of the top plate will align with the channel for added security when tightening.

Note: The End Stop is not compatible with the A profile channel.

The **ES** products can be inserted from above at any given position along the rail to secure the FCL Conduit Clips.

The above picture shows 2 FCL clips seperated by a spacer (CS-CT) and secured by 2 End Stops (ES-AL) to maintain position in the Channel.

Channel Nut

The Channel Nut can be used to create a fixing base for Mounting Channels of Profile B and C. It is used when securing the FCLAMP on to Mounting Channel.

The Channel Nut can be inserted at any position along the channel, from above. Its position is secured using a bolt (not supplied). The bolt length will be dependant on the Channel depth and configuration of components.

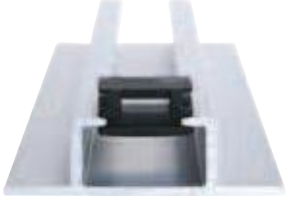
Use Table on page 77 to calculate dimensions of components.

Note the orientation of the Channel Nut for correct installation. Ensure TOP is facing up to ensure correct fixing. The Channel Nut is available in either Aluminium or Galvanised Steel.

Spacer / Cable Tie

Multiple FCL clips can be positioned along the channel. Use CS-CT between the FCL clips to provide access for the hinged lid. This also provides a clear space between conduit runs.

A Spacer is required to ensure enough room to access the hinged lid design of the FCL clip, which offers added security for Conduit retention.



The CS-CT is a multi purpose component suitable for use within Mounting Channels.

It can be used as a Spacer to create a gap between conduit systems / runs. To use as a Spacer slide into the channel from the end in the orientation as shown in fig.1

It can also be used to secure Cable Ties or create a fixing point for identification. To use with a Cable Tie or fixing point slide into the channel from the end in the orientation as shown in fig.2

Fig.1
Orientation when used as a Spacer.

Fig.2
Orientation when used to secure conduit with a Cable Tie.

Design acts as either a spacer or if reversed will act as a location to secure a Cable Tie.

The design of CS-CT works to allow Cable Ties to secure conduit in the either the horizontal or vertical orientation.

The design of CS-CT works to allow Cable Ties to secure conduit in the either the horizontal or vertical orientation.

Ensure you slide the CS-CT in the desired orientation to create the required fixing point for the cable tie.

Fig.3 Offers fixing for conduit routed at 90° to channel.

Fig. 4 Creates fixing for conduit routed in line with channel.

Securing Conduit - FCL Clips and F-Clamps

Fixing Conduit

Simple Removal

Ensure the hinged lid is open and insert the conduit from above. The clip size is shown on the clip for easy reference. The clip provides a secure fit whether the hinge is open or closed. The FCL clip includes an internal rib to help locate and retain corrugated conduits. The FCL-P clips do not have this rib and can therefore be used with plain or smooth outer conduits.

Once the conduit is located, close the hinge and listen for a click. The clip does not rely on the hinge to retain the conduit in place however the lid increases conduit retention.

To remove the conduit insert a small screwdriver where it states OPEN. Push down and lever to release. The hinge should then be free to open.

Fixing Conduit

Fig.1

Fig.2

Fig.3

Fig.4

Our F-Clamp solution is ideal for added security and fixing of conduits which could be subject to vibration, stresses or continuous and repeated movement. There are various fixing options depending on the installation.

- Fig.1 represents a Weld Plate with an F-Clamp with a Cover Plate.
- Fig.2 represents an elongated Weld Plate with an F-Clamp and a Cover Plate.
- Fig.3 shows an F-Clamp mounted directly onto Channel Profile B using Channel Nuts.
- Fig.4 shows and F-Clamp mounted directly onto Channel Profile B using Channel Nuts with a Cover Plate.

F-Clamp KIT Installation

Step by Step Guide - F-Clamp Kit

The F-Clamp Kit is the ultimate in simplicity for a secure mounting assembly for Conduit on Channel.

Simply select your size of F-Clamp Kit from the table on Page 76, depending on the size conduit to be secured, and everything you need is included in the kit. The Step by Step guide below shows the construction.

F-Clamp Kit consists of:

- 1 x F-Clamp - Top and Bottom sections
- 2 x Cover Plates - Top and Bottom
- 2 x Channel Nut Assembly
- 2 x Nuts

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

F-Clamp Other Options

Universal Adaptor

The Universal adaptor provides a mounting option for F-Clamps when used with various channel rails.

The Universal adaptor allows compatibility with other channel rails such as Unistrut®, Halfen and Hilti rails. For further details consult us or visit our website.

The F-Clamps products can be mounted (and stacked) securely. For further details contact us.

Accessories

The Cover plate sits on top of the F-Clamp and can be used to provide additional strength when using the F-Clamps.

For additional strength the F-Clamps can be mounted onto Weld plates. Flexicon can offer two versions. For further details consult us.

F-Clamp Stacking

The F-Clamps products can be mounted side by side and / or can be stacked vertically. This offers a flexible and adaptable method of support for different conduit sizes.

For stacking arrangements and stacking bolts contact us for further details.

Hazardous Areas

Introduction

Hazardous Areas exist where a flammable mixture of gas and air, or dust and air, can exist in large enough quantities and for long enough periods to create a risk of explosion if an ignition source is present. Wherever possible it is important to minimise the risk of explosive mixtures forming and / or the risk of ignition. In the instances where this is impossible or impractical then means of providing a level of protection are required.

This guide will briefly explain how people and plant can be protected in hazardous areas. The guide is particularly focussed towards applications for the Flexicon EXD conduit gland and is not intended to be a full guide to hazardous areas. Users of this conduit gland should be fully qualified, competent and conversant with hazardous area requirements.

Flammable Mixtures & Ignition Sources

Flammable gases when mixed with air can be explosive. Gases are categorised into 3 groups with Group A being the least explosive and Group C being the most explosive. Equipment is also classified from T1 to T6 according to maximum allowed temperature of the equipment to prevent ignition of the gas/air mixture it is designed to work in.

Certain fine dusts dispersed in air can also be explosive.

Ignition sources include: sparking due to static discharge, electrical arcs, lightning, hot engine exhaust, hot equipment and heat from chemical reactions.

Hazardous Area Zones

The level of risk in hazardous areas is defined by a zoning system.

Zone 0

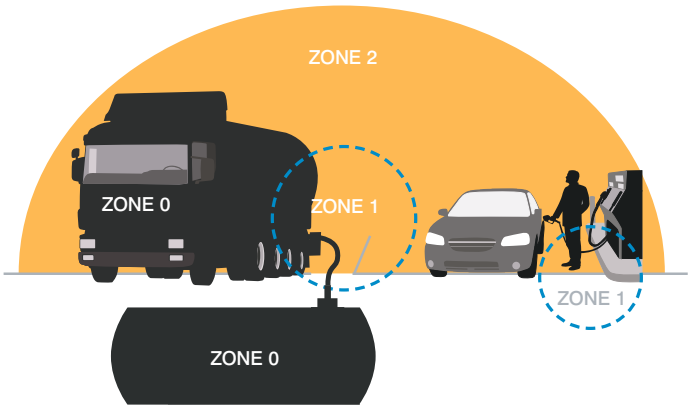
A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is present continuously or for long periods or frequently.

Zone 1

A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is likely to occur in normal operation occasionally.

Zone 2

A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.



Combustible Dust Hazards

IEC 60079-31 - Electrical apparatus for use in the presence of combustible dust.

Zone 20

A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.

Zone 21

A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.

Zone 22

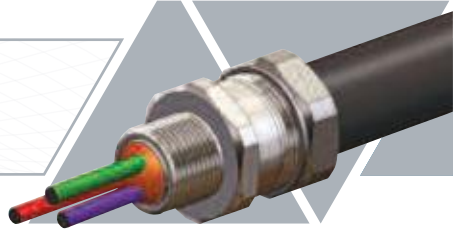
A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

Flexicon's EXD barrier glands range can be used in Zone 1 and Zone 2 areas where Group A, B or C gases are present. As the gland does not add to the temperature of the enclosure, it does not have a temperature classification and so can be used with all temperature classes. Flexicon's EXD barrier glands can be used in Zone 20, Zone 21 and Zone 22 where explosive dust may be present.

Anti-Static Applications

Clause 7.4 of EN60079-0 refers to the avoidance of a build-up of electrostatic charge on Group I or Group II electrical equipment. Electrical equipment shall be so designed that under normal conditions of use, maintenance and cleaning, danger of ignition due to electrostatic charges shall be avoided. This requirement is satisfied by suitable selection of the material so that surface resistance complies with either of the limits given below when measured in accordance with 26.13;

$10^{9}\Omega$ measured at (50 ± 5) % relative humidity; or $10^{11}\Omega$ measured at (30 ± 5) % relative humidity.



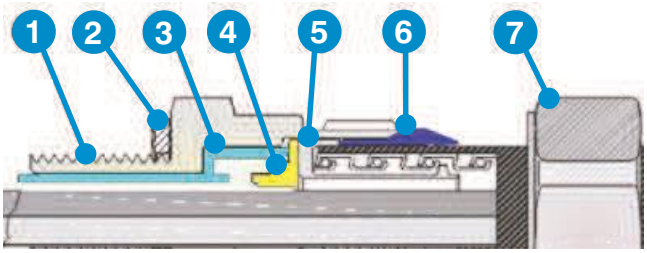
Flexicon EXD Conduit Gland

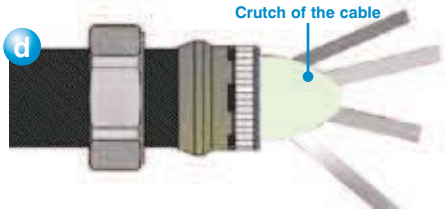
Installation Guide & Instructions

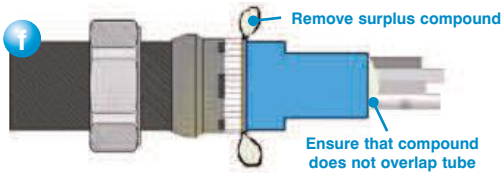
Technical data and specification.

Conduit Gland Components

1. Gland Body
2. RSW Washer
3. Compound Tube
4. Cap
5. Conduit Insert
6. Conduit Seal
7. Compression Nut







NOTE: For LTPB-EXD and LTP-EXD-90 & 45 installation instructions visit our website for further information.

Installation instructions for Flexicon conduit gland type EXD

Please read all instructions carefully before beginning the installation

a Disconnect the Compression Nut(7) and remove the Conduit Seal (6) and Conduit Insert (5) from the gland. Slide the nut over the conduit, followed by the conduit seal (oriented as shown below) and screw the conduit insert into place.

b Remove the Compound Tube (3), and Cap (4) as an assembly from the Gland Body (1). Feed the prepared cable/cores through the flexible conduit and then pass the cap over the cores so that it rests on the conduit insert (5).

c If the installallation involves a cable, remove any bedding or filers from around the cable cores. If the cable cores have screens, these should be unravelled and then twisted together to form a single core. Wearing the protective gloves supplied, mix all of the two-part epoxy compound as supplied until it is pliable and an even colour is achieved. The minimum temperature when mixing is 10°C.
Note: Ensure compound is within use by date. If not please contact Flexicon for replacement.

d Separate the cable cores and apply the compound to the crutch of the cable for a distance of about 6mm and pack into place. If a drain wire is present then it should be sleeved with some heat shrink tubing which is pushed into the compound before shrinking with the application of some heat. Screens that have been twisted together should be treated as a drain wire.

e Bring the cores together again and pack more compound around them to a length and diameter sufficient to fill the compound tube, ending in a taper.

f Pass the compound tube (3) over the conductors until the stepped end is fully located with the cap (4). Pack more compound into place until the compound tube is fully filled and all conductors are fully surrounded with the compound. Ensure compound **does not** overlap tube. Remove **all** compound from surface of tube. Remove all excess compound when assembling.

g Re-install the conduit assembly into the entry item making sure the compound is not disturbed and loosely tighten the compression nut (7) onto the gland body (1). When the compound has cured the entry item should be removed from the assembly and fitted to the apparatus. The gland can then be retrofitted into it and the compression nut (7) finally tightened. Typical cure times are shown below.

Installation Instructions

Installation should only be performed by a competent person using the correct tools. Read all instructions before beginning installation.

Special Conditions For Safe Use

1 The cable gland shall only be used where the temperature at the point of entry is in the range of –60°C to +85°C.

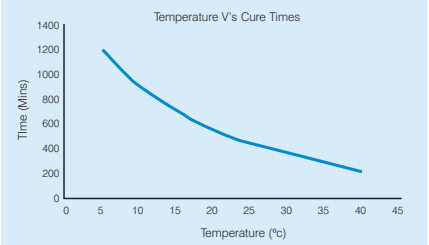
2 The female entry may need additional sealing to maintain the ingress protection rating as applicable to the associated equipment to which it is attached.

3 The cable gland is designed for use in Group I applications where the installed cable is compliant with the requirements of the local code of practice and conduit provides additional mechanical protection.

4 When installing the gland into a plain hole ensure that the diameter of the hole is no greater than 0.7mm larger than the diameter of the thread. An appropriate metal locking nut should also be used.

5 Ensure throughout the compound length at least 20% of the cross sectional area of the compound tube is filled with compound.

6 The fittng is only suitable for fixed installations. Ensure the conduit is effectively clamped to prevent twisting and pulling.



Product Testing & Approvals

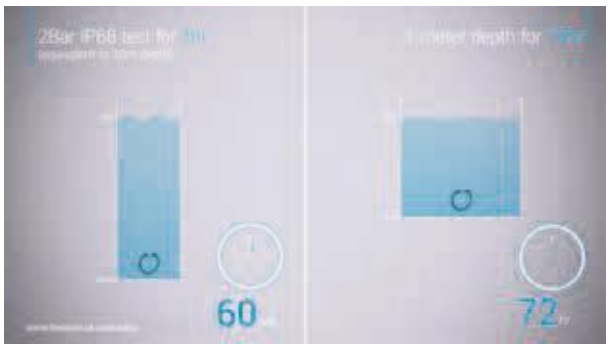
Compliance with international standards

Our products have been designed to be compliant with international standards from EN, NFF, DIN, BS, ASTM and UL. We have extensive third party and in house testing to support product performance.

Flexicon has been assessed and certified in accordance with the International Railway Industry Standard (IRIS) for the activities of Design and Development and Manufacturing for the scope of certification: 20 (Single railway components) Design, development and manufacture of Flexible Conduit Cable Protection Systems.

Flexicon are RISQS verified so buyers can quickly establish and assess our Safety Management, Capacity, Quality Management and Corporate legislation compliance. Flexicon's Hazardous area approvals are audited to EN/ISO 80079-34.

Tested to Extremes



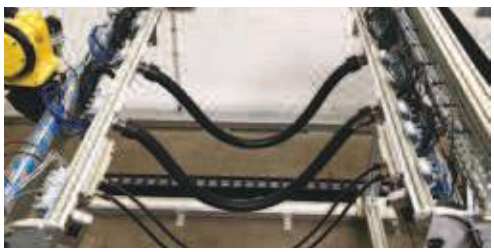
Our products have been tested to the extremes to ensure suitability for technically demanding environments.

For example, to demonstrate the Ingress Protection performance to IP68 we've tested our products for Ingress Protection to 1 metre depth for a period of 72 hours, far beyond the requirements of the BS EN IEC 60529.

We've also tested our products for 2 Bar (equivalent to 20 metre depth) for a period of 1 hour. These tests are conducted at minimum bend radius.

Customer Tests

Testing rig with FPIH and FPIHR



FPIH and FPIHR different sizes

With Brass threaded Flexicon fittings

Fatigue Life – Simulation of minimum 35 years service – >1million cycles

Customers are looking for confidence and reassurance in the materials / products they are using and often specify performance tests that are far in excess of any product standards which may be too generic or perhaps not arduous enough due to specific hazards or risks. A good example is a fatigue life test to represent a service life of 35 years for conduit used for Intercar jumpers. This test was conducted over 1 million cycles with no point of failure so we can clearly demonstrate servicable lifetimes beyond 1 million cycles.

Product Testing & Approvals

Other Product Testing

- Vibration and Shock Testing to EN 61373 Cat 2
- UV testing to UL 1660, 1,000 hour xenon arc
- Extended UV testing, 13,000 hour xenon arc
- 1,000 hours salt spray testing for corrosion
- Fire performance testing including flammability, smoke, toxicity, halogen content and fire load - see page 148
- Electrical insulation testing to EN 61386 and ASTM D 495 and 3638
- Enviromental - 2 weeks at 95˚C - 90%rh
  - 2 weeks at 105˚C
- Direct lightning strike of conduit and fixed fittings
- Low temperature impact testing
- EMC screening performance
- Anti-static testing
- Food contact testing to EU 10 2011

International and National Conduit Standards

- BS EN IEC 61386-1 Conduit Systems, generally accepted worldwide other than North America
- BS EN IEC 61386-23 Flexible Conduit Systems
- BS EN IEC 61386-22 Pliable Conduit Systems
- AS/NZS 2053, Australia and New Zealand but based on IEC 61386
- UL 1660, Non-metallic UL listed conduit for North America
- UL 360, Metallic UL listed conduit for North America
- UL 514B, UL listed conduit fittings for North America
- UL 1669, Non-metallic UL recognised conduit systems for North America

Datasheets & Technical Info

We pride ourselves on the rigorous testing and approvals we apply to our products.

To give you confidence and help you select the correct products for your application we can provide Technical datasheets for all our products, documenting performance properties and key specification information.

Our datasheets are available on request and provide supplementary information on;

- Key Dimensions - Line Drawing (Full 3D CAD models also available)
- Construction and Materials
- Product Features & Applications
- Testing and Approvals - Report details and Test Certificate Numbers
- Performance data - e.g. HL Classifications, LOI % etc

Technical Data - Fire Performance

The reaction of products in the event of a fire is critical when it comes to effective product specification. There are recognised national and international standards related to products performance and reaction to fire. Flexicon can offer a wide range of conduit systems which have been independently tested.

Low Fire Hazard systems are required to protect the public, personnel and property in the event of a fire and are demanded by specifiers, Industry Bodies, Train and Network Operators, fire services and even insurers.

At Flexicon we define a Low Fire Hazard product by having <u>all</u> of the following properties:

Highly Flame Retardant

to prevent a fire starting 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. Halogens are Fluorine, Chlorine, Bromine and Iodine.

Our product development programme involves extensive testing to the latest Rail Industry standards to ensure the safety of our products, thus providing confidence for specifiers and consultants when it comes to their reaction to fire.

EN 45545 - European Fire Safety

This new European standard is rapidly replacing national standards in Europe and consists of 7 parts.

Conduit performance is quoted to EN 45545-2. R22 is for interior parts and R23 is for exterior parts.

There are three defined levels of performance related to the reaction of fire, HL1, HL2 and HL3. HL3 is the highest level of performance when it comes to the reaction to fire, and will be specified for higher risk applications.

BS 6853

This UK standard relates to passenger rolling stock and are classified into two main categories depending on the operating environment.

Category I relates to Underground applications, which is then sub divided into 2 parts, depending on operating conditions.

Category II relates to Surface stock.

TFL S1085 - Transport for London

This standard is used by London Underground to control the materials used throughout their Underground and Crossrail System.

This standard considers flammability, smoke and toxic fume emissions and includes tests from BS 6853.

Products approved for use have APR numbers. Flexicon's range of conduit systems have 6 Certificates, covering 11 products as Authorised for use.
Certificate No. 296, conduit types FU, SSU and FUSSB.
Certificate No. 297, conduit types LFHU, LFHUBRD & LFHP.
Certificate No. 298, conduit types FPR and FPRSS.
Certificate No. 658, conduit type LTBRDLFH.
Certificate No. 2020, conduit type LTPLFH.
Certificate No. 2624, EXD barrier glands.

Flexicon products tested to;

NFPA 130 - North American Standard

This standard is used by US Rail authorities.
Tests called up by NFPA 130 are ASTM E 162 (for flammability) and ASTM E 662 (for smoke). Other North American standards are: ASTM E 1354 Heat Load, Boeing BSS 7239 Toxicity

NF F 16-101/2

This French rail standard consists of an Ignition rating (I) and a Fume Rating (F).
The lower the number the higher the level of performance when it comes to the reaction to fire. I2 F2 offers more protection than I3 F2.

DIN 5510

This German standard consists of three elements including Flame Spread, Smoke evolution and Flaming droplets. Products categorisation looks like this: S4 / SR2 / ST2.

AS/NZS 1530.3 - Australian Standard

This standard is used by Australian Rail.

CEI 11170 - Italian Standard

This standard is used by the Italian Rail. Products categorisation looks like this: LR4.

Russian Fire Safety Certificate - 1374363

Methods of Assessing Fire Performance

Flame Retardancy The minimum requirement is self-extinguishing according to the worldwide conduit system standard BS EN IEC 61386 where a vertical sample of conduit is exposed to a 1kW burner and must extinguish within 30 seconds of the removal of the flame. The char must not have travelled more than a certain distance up the sample and there must be no flaming droplets. Fittings are tested by means of a 750°C glow wire test.
To assess how flame retardant a material is, the normal test method is to measure the Limiting Oxygen Index (LOI) according to BS EN ISO 4589-2 which determines the percentage of oxygen that needs to be present to support combustion. The higher the LOI percentage, the greater the flame retardancy of the material. Oxygen present in normal air is approx. 21%.
Another method is the glow wire test, BS EN IEC 60695-2, which applies a glow wire to a plaque of material at 750°C, 850°C or 960°C. UL94 is an Underwriters Laboratories standard that measures the rate of burning up a vertical test plaque, category V0 is the most flame retardant followed by V1 and V2. There is a category HB but this indicates that the material is flammable even along a horizontal test plaque.

Low Smoke emission There are a number of fire tests, mainly from the rail industry, where a specified sample of material is burnt under controlled conditions in a given size smoke chamber and the smoke obscuration of a defined beam of light is measured. Although the different tests are similar, the results and the requirements are different.

Low Toxicity There are a number of fire tests, mainly from the rail industry, where a specified sample of material is burnt under controlled conditions in a given size smoke chamber and the fumes are analysed for various gases, the concentration of each gas is then multiplied by its toxic potency to give a toxicity index. Although the different tests are similar, the results and the requirements are different.
If halogens, sulphur or phosphorus are present in a material, it is unlikely to pass the low toxicity tests.

Halogen Free The Halogens are fluorine, chlorine, bromine and iodine. Chlorine is the most common in PVC, fluorine is in fluoro-polymers and bromine appears in flame retardants. All of them give off highly toxic fumes and thick smoke. A material cannot be considered as Low Fire Hazard if it contains halogen. However a halogen free material is not necessarily Low Fire hazard as it may not be low toxicity, low smoke and highly flame retardant.
Halogen content is assessed by various chemical tests and analytical techniques.

Classification of Low Fire Hazard performance (LFH)

Inherently Low Fire Hazard
These products are made entirely from metals so there is no non-metallic material to burn or create smoke or toxic fumes.
Inherently Low Fire Hazard products include; FU, SSU, FB, FUSSB, FTCB, FSS, FSSBRD and metal fittings.

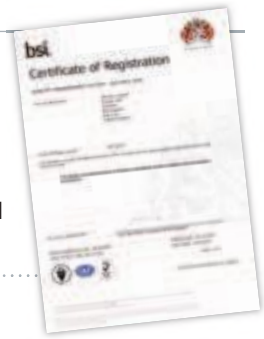
Extra Low Fire Hazard
These products have a Limiting Oxygen Index of greater than 32% as well as being low smoke and low toxicity.
Extra Low Fire Hazard products include; LFHU, LFHUBRD, LTPLFH, LTBRDLFH, LFHP, FPR, FPRSS, FPIHR, FPIHRSS and FPRTC.

Standard Low Fire Hazard
These products have a Limiting Oxygen Index of greater than 26% as well as being low smoke and low toxicity.
Standard Low Fire Hazard products include; FPAS, FPAH, FPI, FPISS, FPIH, FPIHSS and PA66 fittings.

Standards and Approvals

Information

FM58347



ISO 9001 - 2015

Flexicon is accredited to ISO 9001 2015 by the British Standards Institution (BSI) for the design and manufacture of conduit systems and accessories. Certificate No FM58347.

BS EN IEC 61386

BS EN IEC 61386

BS EN IEC 61386 is the worldwide standard for conduit systems providing standardised tests and classifications of system performance.

Our Technical Director, Ian Gibson, is the chairman of both the IEC (worldwide) and CENELEC (European) committees that prepare conduit standards.

CE

Flexicon are marked with the CE mark to show that they comply with the essential requirements of the relevant European Directives.

RoHS

All Flexicon's products meet the requirements of the European RoHS Directive, Restriction of Hazardous substances. This precludes the use of certain toxic materials and heavy metals.

REACH

All Flexicon's products meet the requirements of the European RoHS Directive, Restriction of Hazardous substances. This precludes the use of certain toxic materials and heavy metals.

IRIS - International Railway Industry Standard

Flexicon has been assessed and certified by SGS in accordance with IRIS for the activities of Design and Development and Manufacturing for the scope of certification: 20 (Single Railway Components) Design, development and manufacture of Flexible Conduit Cable Protection Systems.

RISQS

Flexicon are RISQS verified so buyers can quickly establish and assess our Safety Management, Capacity, Quality Management and Corporate legislation compliance.

Transport for London - TFL

Flexicon have a number of products that have been approved for use by London Underground and Crossrail.

Network Rail - PADS Approval

Flexicon have a number of products approved to the new enhanced PADS approval for Flexible Conduits, Glands and Accessories intended for use in signalling and infrastructure applications. This requirement now includes applications prone to flooding or prolonged immersion under water.

Railway Industry Association (RIA) & Rail Alliance

Flexicon are active members in the Railway Industry Association and Rail Alliance.

Hazardous Area Approvals

Flexicon's EXD glands have been independently tested and accredited for ATEX and IECEx Ex d, Ex e and Ex t applications. These glands also have CU-TR approvals.

Our LTP EXE range of fittings have been tested and accredited for both ATEX and IEC Ex.

Our LTP-CUL fittings have been UL listed and are suitable for use in Hazardous locations as per NEC Article 501(B)(2) Class I Div 2, Article 502 (A)(2) & (B)(2) Class II Div 1&2, Article 503 (A)(3) & (B)(3) Class III Div 1&2.

Hazardous area products

IEC 60079-1, Ex d Flameproof glands

IEC 60079-7, Ex e Increased Safety glands and conduit fittings

IEC 60079-31, Ex t Dust Ignition Protection glands and conduit fittings

IEC Ex factory approval for the manufacture of Ex d, Ex e and Ex t products by Intertek.

- EN 60079-1, Ex d Flameproof glands

- EN 60079-7, Ex e Increased Safety glands and conduit fittings

ATEX factory approval for the manufacture of Ex d and Ex e products by Intertek.

North American Approvals

Our FPASC nylon conduits from 21mm to 67mm have Underwriters Laboratories (UL) listing for use in USA and Canada to the UL standard UL1660 - File No. 246572.

Our FPAX and FPAU fittings have UL listing to UL514B and CSA standard C22.2 No. 18.3-04. File No. E247502.

Most of Flexicon's nylon conduits (FPAS, FPAL, FPAH, FPR, FPI and FPIH) and fittings (FPA, FPAX, and FLK) have UL recognition to UL 1696 for use in USA and Canada - File No. E229161.

LTPUL conduit is UL listed to UL360 and CSA approved. Our LTP-CUL fittings are UL listed to UL514B and are suitable for use in Hazardous locations as per NEC Article 501(B)(2) Class I Div 2, Article 502 (A)(2) & (B)(2) Class II Div 1&2, Article 503 (A)(3) & (B)(3) Class III Div 1&2.

FPC conduits and MPC fittings are UL recognised to UL1696 for use in USA and Canada - File No. E229161.

We have tested a selection of our products for UV performance against UL 1660 test criteria (see UL Test Report No. 13CA50836)

EU Regulation 10/2011

EN 1672-2 EN ISO 14159

Hygienic Applications

Flexicon's Hygienic products are manufactured from FDA approved ingredients and have been independently tested to European Food Regulation 10/2011.

Lloyds Register of Shipping Type Approval

Specific conduit systems from Flexicon have Lloyds Register of Shipping Type Approval having been assessed for suitability for marine and other arduous applications.

UK MOD - NCAGE No. U5256

Flexicon is a registered supplier to the UK Ministry of Defence NCAGE No. U5256 and holds NATO codification numbers for specific conduits.