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FLEXIBLE CONDUIT SOLUTIONS

A PART OF atkore INTERNATIONAL

# Cable Protection Systems for Rail

2nd Edition

IRIS™ Certification
ISO/TS 22163:2017

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CABLE PROTECTION SYSTEMS FOR RAIL

2nd Edition



# Group Intro

Atkore delivers a unique portfolio of integrated electrical raceway solutions that deploy, isolate and protect structures or systems electrical circuitry from source to outlet.

atkore INTERNATIONAL



**Flexicon is focused on bringing customers the latest solutions and technologies for Cable Protection. We design, develop and manufacture our products from our headquarters in Birmingham, UK therefore you can be assured of our quality and engineering excellence.**

## We drive innovation, developing tomorrow's solution for today.

MADE IN THE UK



With 3,500 employees and 58 manufacturing and distribution facilities worldwide, Atkore meets customers' needs by providing unmatched quality, delivery and value across a robust product line that includes steel, PVC and aluminium conduit, armoured cable and flexible conduits, metal framing, wire baskets, cable trays and other complementary products including fittings and mechanical pipe.

Flexicon's range of non-metallic and metallic products help to protect cables from end to end, in many diverse markets, from Rail, & Transportation, Utilities, Machinery & Automation / OEM's and Hazardous Areas, Food Processing and Pharmaceutical to Construction.

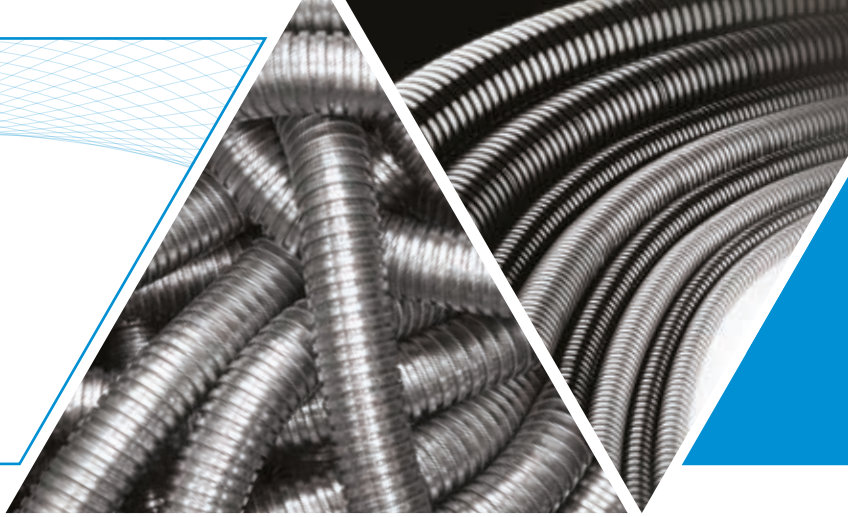
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As part of the international Raceway division of Atkore that includes Marco Cable Management and Unistrut, we are market leaders in electrical raceway, with the resources, technology and products in place ready to support you with your next project.

# Contents




## Introduction

| | |
|---|---|
| Why chose Flexicon - Flexicon Capabilities & Global Presence | 4 |
| Ingress Protection - Considerations | 6 |
| Fire Performance - Considerations | 8 |
| Benefits of Flexible Conduit | 10 |

## Applications in Rail

| | |
|---|---|
| Rolling Stock Product Testing | 14 |
| Rolling Stock Reference Projects | 15 |
| Rolling Stock Applications | 16 |
| Infrastructure Track Record | 20 |
| Infrastructure Applications | 22 |
| Signalling & Power Distribution Systems - UK | 26 |

## Non-Metallic Conduit & Fittings

| | |
|---|---|
| Non-Metallic Conduit Selection Chart | 28 |
| FPAS, FPASC, FPR, FPAH Conduits | 30 |
| FPI, FPIH, FPIHR, FPADS Conduits | 31 |
| FPA Type Fittings | 32 |
| FPAX Type Fittings | 38 |
| Flexicon Ultra™ Fittings | 44 |
| Abrasion Rings, T-Pieces, Dividers & Reducers | 50 |
| FPRSS, FPRTC, FPISS, FPIHSS, FPIHRSS Conduits & Fittings | 52 |
| FTCB Braid Sleeving & Fittings | 54 |
| Network Rail Conduits | 56 |
| Network Rail Fittings | 58 |
| Network Rail Cable Glands & Accessories | 60 |
| Round Connection Boxes | 62 |
| Large Diameter Conduit & Fittings | 64 |

## Metallic Conduit & Fittings

| | |
|---|---|
| Metallic Conduit Selection Chart | 66 |
| FU, SSU Conduits & Fittings | 68 |
| FSU, LFHU, FPU Conduits & Fittings | 70 |
| LTP, LTPLFH, LTPHC Conduits | 72 |
| LTPPU, LTBRDP, LTBRDLFH Conduits | 73 |
| LTP Standard Fittings | 74 |
| FB, FUSSB Conduits & Fittings | 76 |
| LFHUBRD Conduit & Fittings | 78 |
| FSS, FSSBRD Conduit & Fittings | 80 |

## Accessories

| | |
|---|---|
| Cable Gland Fittings - Cable Strain Relief | 82 |
| SS & NPB Round Connection Boxes | 83 |
| Accessories - Locknuts, Washers, Clips Clamps & Stopping Plugs | 84 |

## Technical

| | |
|---|---|
| Resistance to Chemicals Chart - Non-Metallic | 86 |
| Resistance to Chemicals Chart - Metallic | 88 |
| Thread Data Tables | 90 |
| IP Ratings & Guidance | 91 |
| Product Testing, Standards & Approvals | 92 |
| Introduction to Unistrut® | 94 |
| Introduction to Marco Cable Management | 95 |






# Flexicon Capabilities

We are focused on bringing customers the best solutions and technologies to solve their Cable Protection requirements.

MADE IN THE UK

**Our knowledge, skills and expertise allows us to offer the ultimate solutions for technically demanding applications. We have been protecting performance and safety critical power and data cabling installations for many years across the world.**

"We specialise in protecting your Cables from hazards for now and for the future"



## Quality Assurance, Testing & Manufacturing

We take testing seriously. Don't just take our word for it. With a dedicated design team, we work at the forefront of material technologies and industrial design to deliver solutions that work not only for today but also for the long term. Our Engineers use their extensive knowledge to drive innovation and develop the future today.

Flexicon have invested in and committed to extensive independent testing for our Products combined with Quality Audits for our Manufacturing Processes including the International Railway Industry Standard (IRIS), giving you the confidence that our systems do what we say they do.



FM58347 · CE · RoHS · REACh · IRIS Certification ISO/TS 22163:2017 · cULus · cULus · EN 45545-2 HL3 · NFPA 130 · UNDERGROUND · NetworkRail



We extensively test our products to ensure that our product performance is as you would expect from a leading British Manufacturer. We understand the importance and potential consequences of product failure therefore we test our products far beyond the performance requirements of the certifications and approvals we have.

# Global Presence

With a Global reach, we work closely with customers to become part of their supply chain. We know how important it is to work with suppliers who offer support, expertise and guidance.





Our products have been installed in all 7 continents, and we currently distribute through approved partners to over 55 different Countries.

Our Flexicon PTY subsidiary is a dedicated Sales and Distribution operation in Australia and New Zealand, well placed to serve the ANZ Markets.

Our sister company AFC Cable Systems provide stock and local support in the North American markets.

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## International & 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



Tested to extremes

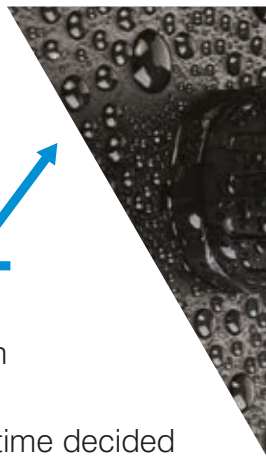
# Rail - Ingress Protection

High levels of Ingress Protection is a critical requirement of installations in the Rail Industry. Whether this is from the weather in the form of rain or flooding, or from brake dust in Underground applications.



"Flooding is one of the most extreme forms of hazards for electrical systems. If product is submerged Ingress Protection becomes critical"





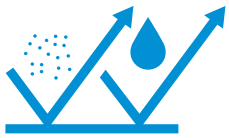
## Applications demand "over and above" standard IP tests

Ingress protection is normally tested using EN IEC 60529, with the levels of protection given by a 2 digit code.

IP68 **1st digit – protection against solid objects and dust**

IP68 **2nd digit – protection against water**

IP tests to EN IEC 60529, give an indication of system performance but they are very short tests on samples that have been assembled under ideal laboratory conditions, at room temperatures and in straight lengths.



**Durations and application of these tests are;**

- IPx4, 5 minutes light spray similar to a shower head
- IPx5, 3 minutes medium spray similar to a garden hose
- IPx6, 3 minutes high pressure jet similar to a fire hose
- IPx7, 30 minutes 1 metre immersion under water
- IPx8, immersion at a pressure and time decided by the manufacturer
- IPx9, 2 minutes high pressure hot water similar to a steam cleaner

## Other potential Hazards to consider

When it comes to protecting Safety and Performance Critical Cabling, we have listed some of the potential hazards to consider in Rail applications.

**Abrasion**
- Process of scraping or wearing something away



**Chemical resistance**
- Reaction to different compounds or substances



**Crush / Compression**
- Forces applied to cause deformation




**Fire**
- Destructive burning



**Lightning Strike**
- Damaged caused by natural electrical discharge



**Impact**
- Sharp or blunt forces which could cause damage



**Tensile Strength**
- Resistance to conduit being pulled from the fitting




**EMC**
- Electromagnetic Compatibility



FLEXICON Ultra
THE POWER OF ONE

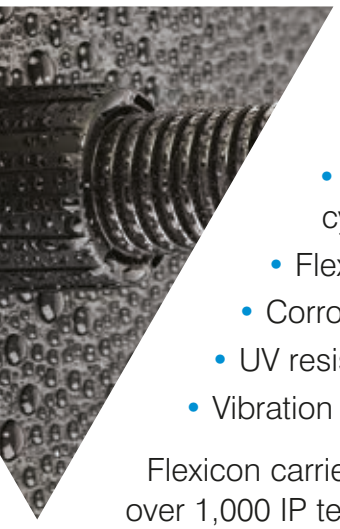
Integrated Sealing Technology

Integrity • Strength • Assurance

"Flexicon Ultra™ has been tested to IP68, submerged at a depth of 1 metre for a period of 3 days at min bend radius"







## Tested beyond the Standard

Water may be present as rain, condensation, immersion including flooding, spray, jet wash cleaning, ice formation and melting. Suction can be created by rise and fall of temperature although conduit systems are normally vented to atmosphere through at least one end. A vented conduit system has advantages over a sealed enclosure with cable glands as the conduit allows the air inside the enclosure to expand and contract with temperature changes.

In conjunction with some of our major rail customers we have completed more onerous testing than the standard tests required to give the customer confidence that true performance adequately represented real life installations.

- IPx8 carried out at 2 bar for 1 hour at minimum bend radius
- IPx8 carried out at 1 metre under water for 72 hours at minimum bend radius
- IPx8 carried out under water and ice at minimum bend radius for 5 cycles of; 10 hours at -15°C followed by 5 hours at +40°C
- Flexing conduit under water for 5 days (exhibition display)
- Corrosion resistance - 1,000 hour salt spray testing to EN ISO 9227 NSS @ 35°C
- UV resistance - up to 21,000 hours testing using xenon arc
- Vibration and shock-testing to EN 61373 category 2, bogie mounted

Flexicon carries out extensive water ingress testing in house. For the Ultra system, over 1,000 IP tests were conducted to ensure that every conduit in every size, weight and material were checked with every type of fitting to ensure the integrity of the system. External test reports were then commissioned to confirm our in-house test results.

**UV**
- Resistance to Ultra Violet Radiation

**Corrosion**
- Damage caused to materials based on chemical reaction

**Grazing animals / Vermin or pests**
- Livestock
- Sharpening of teeth and searching for food

**Vibration & Shock**
- Shaking or sudden movement

**Theft & Vandalism**
- Stealing, unauthorised removal or deliberate damage

**Fatigue Life**
- Weakness caused by repeated variations of stress or continuous and repeated movement

**Temperature**
- Intensity of heat present - high or low. Rapid changes of temperature

**Salt Water**
- Prolonged exposure can cause dezincification (Corrosion)



# Rail - 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.

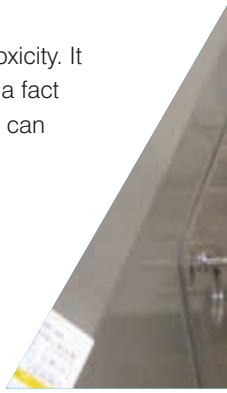
**At Flexicon we define a Low Fire Hazard product as having <u>all</u> of the following properties:**

**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 people to see their way to escape.

**Low Toxicity**
in the event of a fire to ensure people 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.



## Rail Industry Standards

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 45545-2 - European Fire Safety
- NFPA 130 - North American Standard
- AS/NZS 1530.3 - Australian Standard
- Russian Fire Safety Certificate - 1374363
- TFL S1085 - UK Underground Standard



## EN 45545-2 European Fire Safety Standard

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

- **Part 1: General**
- **Part 2: Requirements for fire behaviour of materials and components**

For Part 2, product groups are required to meet a set of performance requirement levels (R1 to R26), conduit performance **R22 is for interior parts** and **R23 is for exterior parts.** There are also 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.

The required HL level is given from a matrix of Operational Category of the track and Design Category of the train.

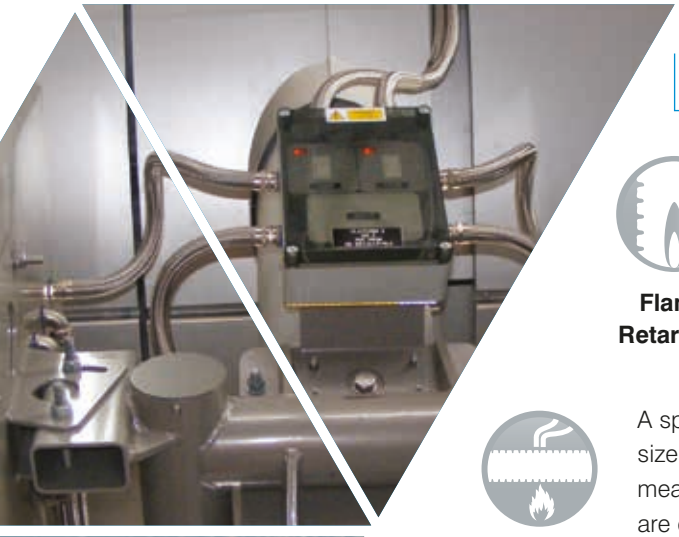
Flexicon EN 45545-2 conduits meet HL3 for both internal and external use.




| | | | | HL1 | HL2 | HL3 |
|---|---|---|---|---|---|---|
| R22 Internal use | T01 EN ISO 4589-2: OI | Oxygen Content % | Minimum | 28 | 28 | 32 |
| | T10.03 EN ISO 5659-2: 25 kWm-2 | *Ds* max. dimensionless | Maximum | 600 | 300 | 150 |
| | T12 NF X70-100-1 and -2, 600° C | *CIT*NLP dimensionless | Maximum | 1.2 | 0.9 | 0.75 |
| R23 External use | T01 EN ISO 4589-2: OI | Oxygen Content % | Minimum | 28 | 28 | 32 |
| | T10.03 EN ISO 5659-2: 25 kWm-2 | *Ds* max. dimensionless | Maximum | - | 600 | 300 |
| | T12 NF X70-100-1 and -2, 600° C | *CIT*NLP dimensionless | Maximum | - | 1.8 | 1.5 |

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.







## Assessing Fire Performance

**Flame Retardant**

To assess how flame retardant a material is, the defined 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%.

**Smoke**

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. The lower the smoke density, the more efficient evacuation and safety for fire fighting becomes.

**Toxicity**

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. If halogens, sulphur or phosphorus are present in a material, it is unlikely to pass the low toxicity tests.

**Halogen Free**

Halogen based materials give off highly toxic fumes and often 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.

## Simple classifications of performance from Flexicon...

INHERENT LOW FIRE HAZARD ★★★

### 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 ★★

### 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.

| LOI | Conduits | |
|---|---|---|
| 35.9% | FPIHR & FPIHRSS | ML3 EN 45545-2 NFPA 130 |
| 37.0% | FPR, FPRSS & FPRTC | |
| 48.3% | LFHU, LFHUBRD, LTPLFH, LTBRDLFH & LFHP | |

STANDARD LOW FIRE HAZARD ★

### Standard Low Fire Hazard

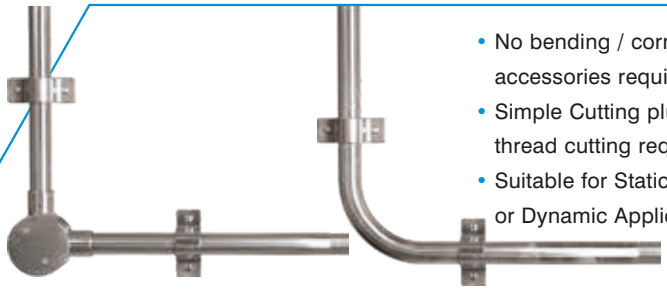
These products have a Limiting Oxygen Index of greater than 26% as well as being low smoke and low toxicity.
Standard Low Fire Hazard products include; FPAS, FPAH, FPI, FPISS, FPIH, FPIHSS and PA66 fittings.

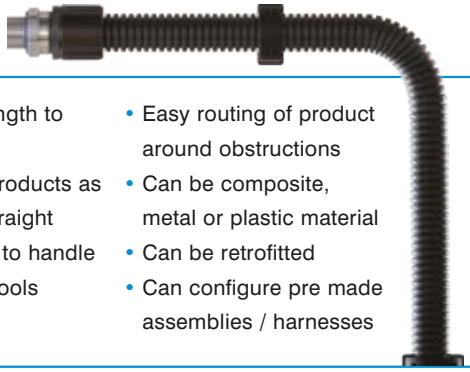


# Benefits of using flexible conduit…

Providing an inherent mechanical barrier for cabling, Flexible Conduit offers more than just protection for Cables and Installations. It allows users and specifiers to do things differently, challenging traditional installation practices and offers unrivalled product performance.

## Flexible Conduit vs Rigid Conduit





- No bending / corner accessories required
- Simple Cutting plus no thread cutting required
- Suitable for Static and / or Dynamic Applications
- Improved strength to weight ratio
- Long Coiled Products as opposed to Straight lengths - easy to handle
- No specialist tools required
- Easy routing of product around obstructions
- Can be composite, metal or plastic material
- Can be retrofitted
- Can configure pre made assemblies / harnesses

## Flexible Conduit vs Cable Glands

- Can group multiple cables in one system meaning less terminations
- Reduced physical glanding space required for termination of cables
- Reduced risk of system failure due to fewer points of entry
- Can replace faulty cables without replacing entire System
- Can upgrade and add circuits with ease
- Fitting does not have to compress the cable to ensure sealing
- Can be retrofitted with ease
- Suitable for use with multiple cable types
- Quicker to install
- Conduit fittings offering strain relief available
- No need for specialist cables



## Flexible Conduit vs Armoured Cables



- Simple Cutting - easier assembly
- Can combine multiple cable types in one system using off the shelf products
- Can make quick changes / upgrades to circuits within existing system
- Easy routing of cables with different bend radius
- Can replace faulty cables without replacing entire system
- Suitable for Static and / or Dynamic Applications
- Can be retrofitted
- Swivel thread fittings available to ease Installation
- Mechanical protection provided by the Conduit - no need for specialist cables
- Easier termination of glands

## Flexible Conduit vs Trunking

- Coiled Products as opposed to lengths
- Easy routing of product
- Can be retrofitted
- Quicker to install
- No requirement for aditional fittings to create a bend
- Simple Cutting
- Simple termination
- Suitable for Static and / or Dynamic Applications



- Simplicity
- Speed of Installation
- Lifetime Solution
- System Integrity



## Realise the Benefits of using Flexible Conduit…

**Simplicity**

- No need for Specialist Cables
- Standard & Single Core Cables can be grouped and protected in one system
- Less Product Inventory in the Supply Chain

**Speed of Installation**

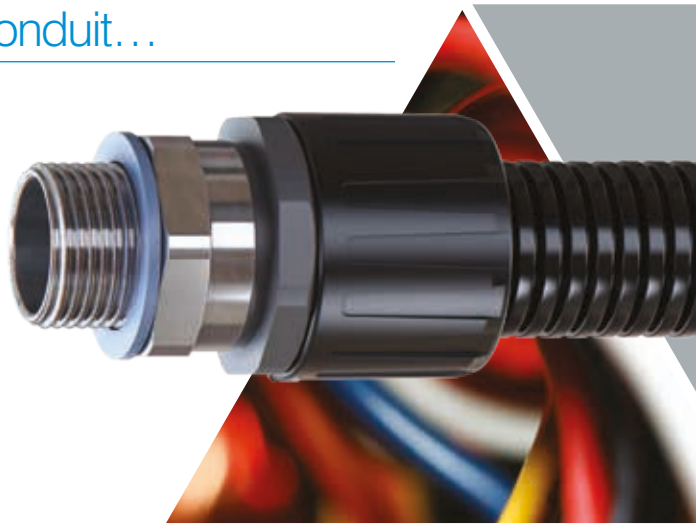
- Combining cables mean less cable entry points / terminations
- Ease of fixing with various securing options
- No special tools required

**Lifetime Solution**

- Can easily add circuits throughout the life of the installation
- Easily accommodate changes as the installation needs change
- Off the shelf products

**System Integrity**

- Properties of the conduit can be matched to the potential hazards of the installation
- Reliable solution for protection of critical cabling
- Light weight product



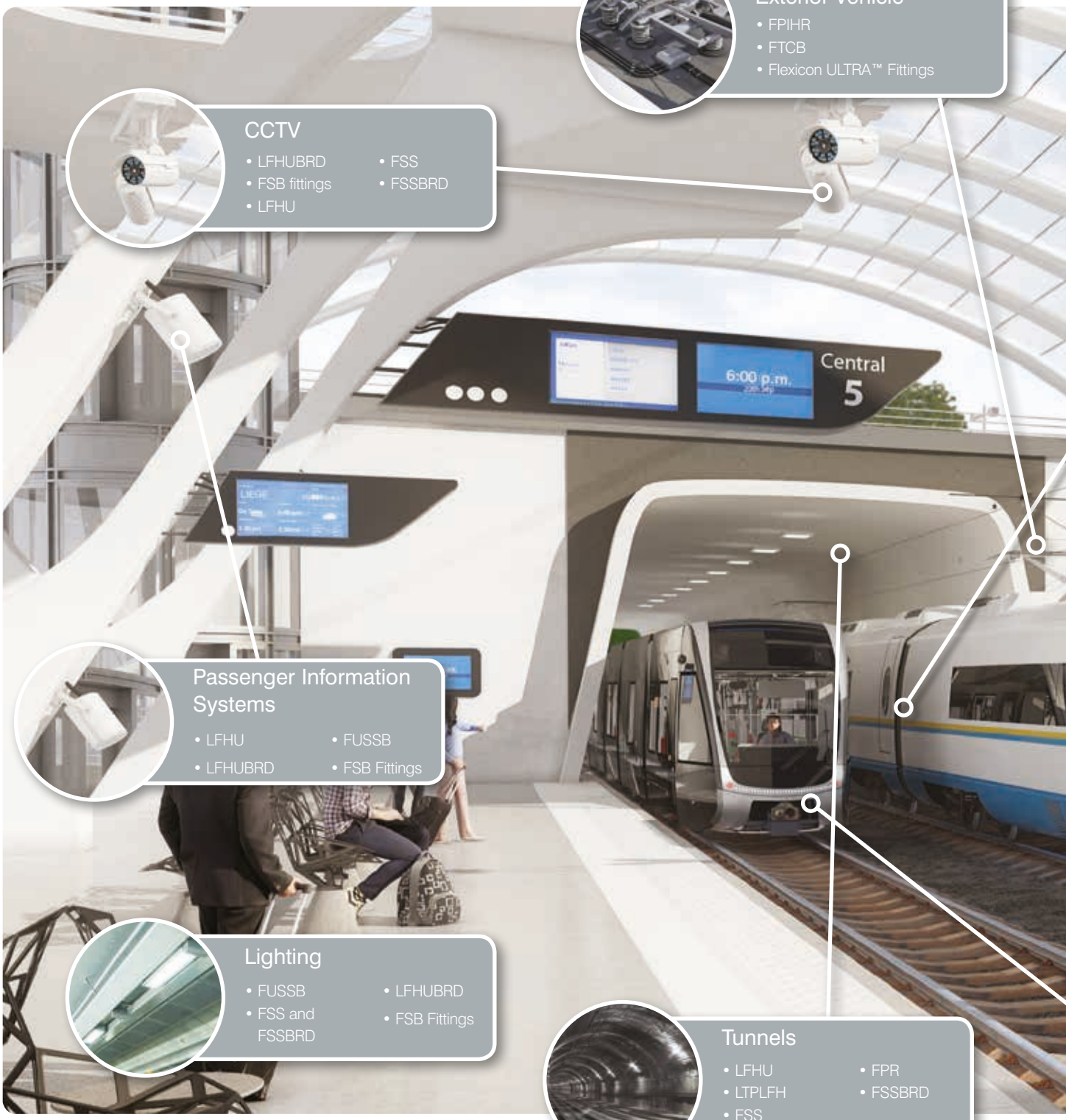


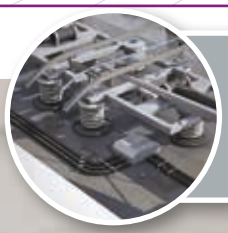




# Applications in Rail

Flexicon offer a range of products for this technically demanding sector. IP ratings, tensile strength characteristics, weight, corrosion resistance, fire performance properties and operating temperature ranges are all factors to consider.



## Exterior Vehicle

- FPIHR
- FTCB
- Flexicon ULTRA™ Fittings



## CCTV

- LFHUBRD
- FSB fittings
- LFHU
- FSS
- FSSBRD



## Passenger Information Systems

- LFHU
- LFHUBRD
- FUSSB
- FSB Fittings



## Lighting

- FUSSB
- FSS and FSSBRD
- LFHUBRD
- FSB Fittings

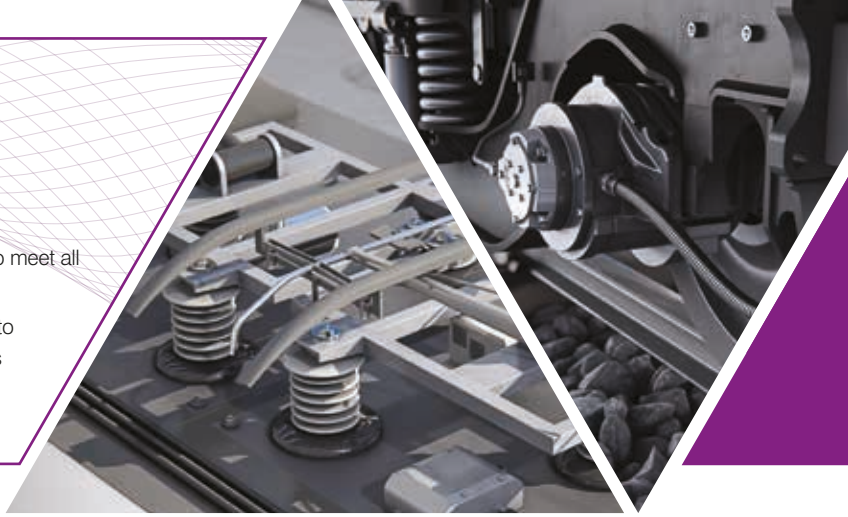


## Tunnels

- LFHU
- LTPLFH
- FSS
- FPR
- FSSBRD

# Rolling Stock and Infrastructure

- High performance products offering superior tensile and impact / compression strength
- Designed to meet the strictest standards – EMC testing /vibration
- Vibration proof
- Wide product range to meet all applications
- Independently tested to the relevant standards
- Anti-tamper





## Inter Vehicle Jumper Applications

- FPIHR
- Flexicon ULTRA™ Fittings



## Interior Vehicle Applications

- FPR
- FTCB
- FPA
- Flexicon ULTRA™ Fittings



## Platform Trackside Power & Signalling

- FPAH
- FPIH
- Flexicon ULTRA™ Fittings



## Bogies & Control System

- FPIHR
- FTCB
- Flexicon ULTRA™ Fittings



## Auto Couplers

- FPIHR
- Flexicon ULTRA™ Fittings





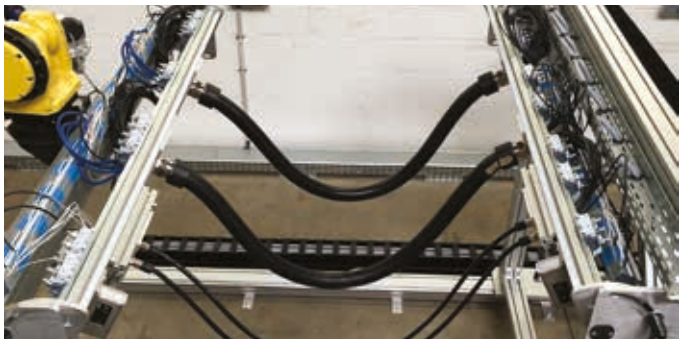

# Rolling Stock Product Testing & Approvals

"This technically demanding sector presents numerous challenges when it comes to product performance and compliance to the relevant standards."

## Alstom Worldwide Approval

Flexicon has earned worldwide approval under Alstom global component parts listing. This includes Flexicon's true one piece Ultra™ gland range that gives the quickest and most reliable interconnection when terminating on to Flexicon's non-metallic Flexible Conduits.

Alstom first carried out mechanical tests on our samples to satisfy themselves of the mechanical performance. Alstom then stated that they were not satisfied that the standard IP testing to EN60529 as the tests did not adequately represent their applications. IP67 1m under water for 30 minutes was far too short a time and IP68 (2bar pressure for 1 hour, equivalent to 20m under water) was of little interest - if the train was 20m under water there would be bigger problems than water ingress into the conduit system. Alstom required 1m under water for 72 hours for straight conduit and then again at minimum bend radius, Alstom also insisted on making up the samples and carrying out the tests themselves.







A 1 million reversed cycling test was conducted to confirm the fatigue life of the conduit and the fittings, fully loaded with cables, to represent 35 years service life for inter-carriage jumpers on the most onerous track, line 11 of the Paris Metro. After the test the conduit was taken apart to check for any wear of the conduit or fittings on the cable and cable on the conduit and Flexicon's product showed no signs of failure.

# Rolling Stock
# Reference Projects





## Russia - Rail Car Refurbishment

Metal braided conduits with fittings, along with Nylon FPR Conduit with FPAX fittings systems were used on the refurbishment of rail cars.

## Dubai - Metro

Nylon FPIHR Conduit and Ultra brass threaded fittings were used on the roof of the carriages for the systems high IP rating and fire performance properties.

## China - High Altitude Rail Link

Plastic coated steel conduits was used on vehicles under-frame harness applications that required properties for low temperature and high impact resistance.

## United Kingdom - Train Renovations

Stainless Steel braided Nylon 6 FPRSS conduit and fittings were used for the installation of under vehicle harness assemblies requiring EMC screening and high IP ratings.

## Indonesia - EMC on Passenger Coaches

LTBRDP liquid tight conduit and LTP fittings were used under the trains for the EMC screening performance. Nylon FPAS Conduits and FPAX fittings were also used where high IP ratings were required.

## Australia - New Vehicle Builds

Liquid tight, high temperature, Halogen free conduit systems were used on new rail vehicle builds.



## United Kingdom - Refurbishment & Maintenance

Nylon 6 & 12 conduits FPR and FPI with FPA fittings were used within an out of warranty repair and overhaul project.

## Czech Republic - Carriage Installations

Nylon 6 & 12 conduit systems for carriage installation both interior and exterior use.



# Rolling Stock

Whether it is high speed travel over long distances, regional transit with repeated short journeys or true power solutions such as locomotives to move large masses of material & freight, we have the most reliable Cable Protection solutions to ensure safety and reliability for all types of Rolling Stock.





**High Speed**



**Intercity**





**Urban & Regional Trains**

## Key considerations

- Reliability
- Service life
- Ease of maintenance
- Standards & compliance
- Operating environment



**Metro**



**Trams & Trolleybuses**



**Monorail**



**Locomotives**





"Flexicon have a proven track record in protecting Safety & Performance Critical Cabling"



## Typical hazards & product considerations

- Fire Performance
- Ingress Protection
- Vibration & Shock Resistance
- Temperature
- Impact
- UV Resistance
- Strength to Weight ratio
- Flexibility
- Fatigue Life
- Abrasion Resistance
- Chemical resistance
- EMC





## Standards

EN 45545-2 HL3 · NFPA 130 · IRIS Certification ISO/TS 22163:2017 · FM58347 · RoHS · REACh · NetworkRail · UNDERGROUND

## Typical Products

30
- FPR - PA6 Corrugated

31 NEW
- FPIHR - PA12 Corrugated

52
- FPRSS - Stainless Steel Overbraid PA6 Corrugated

70
- LFHU - LFH Coated Galvanised Steel

73
- LTBRDP - Galvanised Steel with Galvanised Steel braid, PVC cover

44 NEW
- FPAU - Range of fittings with or without metal threads

61 NEW
- F-Clamps and Fixing Accessories



# Rail - Rolling Stock Applications

Passenger safety and operational integrity are vital characteristics of a modern rail network.

**We know and appreciate the various challenges involved in achieving compliance to the latest industry legislation, managing and controlling risk, making procurement more efficient whilst striving for continuous improvement across the entire railway system.**

## Inside Carriages / Passsenger Zones



**FPR Conduits**

- Modified PA6 conduit offering excellent Fire Performance
- Light weight
- High Tensile strength
- Vibration resistant



- Flexicon ULTRA™ - nylon thread
- Flexicon FPA - nylon thread




30

## Carriage Lighting



**FPR Conduits**

- Modified PA6 conduit offering excellent Fire Performance
- Light weight
- High Tensile strength
- Vibration resistant



- Flexicon ULTRA™ - nylon thread
- Flexicon FPA - nylon thread




30

## Carriage TV Screens



**FPR Conduits**

- Modified PA6 conduit offering excellent Fire Performance
- Light weight
- High Tensile strength
- Vibration resistant



- Flexicon ULTRA™ - nylon thread
- Flexicon FPA - nylon thread




30



## Under Carriages / Bogies



**FPIHR Conduits**

- Modified Heavy Duty PA12 conduit offering excellent dynamic performance with flexibility & fatigue life combined with Fire Performance.
- Excellent UV resistant & high impact strength even at low temperatures
- Excellent Ingress Protection integrity when used with Flexicon ULTRA™
- High Tensile strength & Vibration resistant

HL3 EN 45545-2 NFPA 130



- Flexicon ULTRA™ - metallic thread
- Flexicon ULTRA™ - metallic thread with strain relief

31



## Above Carriages



**FPIHR Conduits**

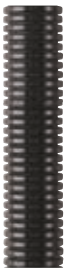
- Modified Heavy Duty PA12 conduit offering excellent dynamic performance with flexibility & fatigue life combined with Fire Performance.
- Excellent UV resistant & high impact strength
- Excellent Ingress Protection integrity when used with Flexicon ULTRA™
- High Tensile strength & Vibration resistant

HL3 EN 45545-2 NFPA 130



- Flexicon ULTRA™ - metallic thread
- Flexicon ULTRA™ - metallic thread with strain relief

31



## Intercar Jumpers



**FPIHR Conduits**

- Modified Heavy Duty PA12 conduit offering excellent dynamic performance with flexibility & fatigue life combined with Fire Performance.
- Excellent UV resistant & high impact strength even at low temperatures
- Excellent Ingress Protection integrity when used with Flexicon ULTRA™
- High Tensile strength & Vibration resistant

HL3 EN 45545-2 NFPA 130



- Flexicon ULTRA™ - metallic thread
- Flexicon ULTRA™ - metallic thread with strain relief

31



## Couplings



**FPIHR Conduits**

- Modified Heavy Duty PA12 conduit offering excellent dynamic performance with flexibility & fatigue life combined with Fire Performance.
- Excellent UV resistant & high impact strength even at low temperatures
- Excellent Ingress Protection integrity when used with Flexicon ULTRA™
- High Tensile strength & Vibration resistant

HL3 EN 45545-2 NFPA 130



- Flexicon ULTRA™ - metallic thread
- Flexicon ULTRA™ - metallic thread with strain relief

31





# Infrastructure Installation Track Record

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS
Crossrail
UNDERGROUND

"Flexicon have the most LUL approved products of any Flexible Conduit Manufacturer"

## Redevelopment of London's Blackfriars Tube Station

Balfour Beatty used Flexicon's flexible conduit to protect all of the cabling for lighting, power, signalling and communications for the major redevelopment of Blackfriars station.

The project included the creation of a common entrance at the north end of the rail bridge spanning the River Thames, increasing the length of the platforms to accommodate 50 percent longer trains, the refurbishment of the underground station and the construction of a new station on the South Bank of the Thames. The station was the first one to span the entire width of the River Thames and features 4,400 of photovoltaic panels producing over 1MW of electricity.

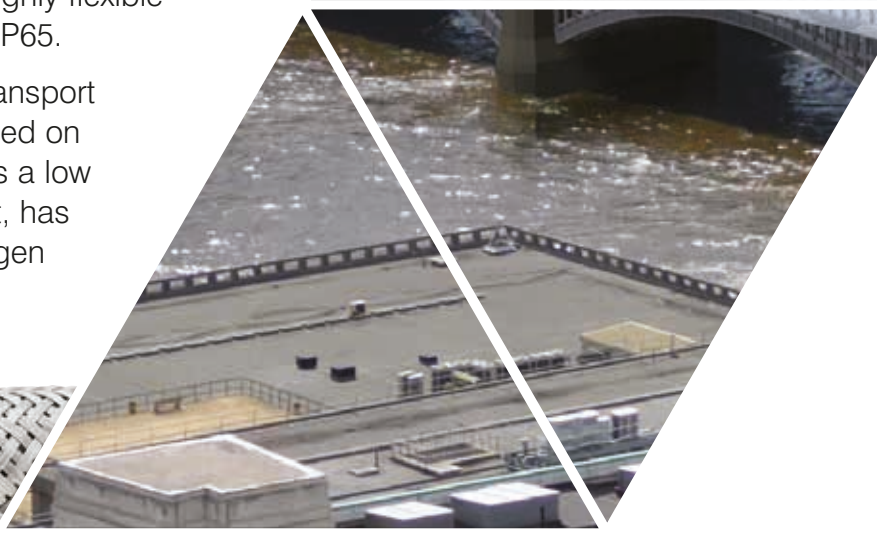
All of the services had been left visible as part of the design, so Flexicon's LFHUBRD flexible conduit had been specified since its grade 316 stainless steel overbraid provides both protection and aesthetic appeal. The system has high abrasion resistance and high mechanical strength, is highly flexible and has an ingress protection rating of up to IP65.

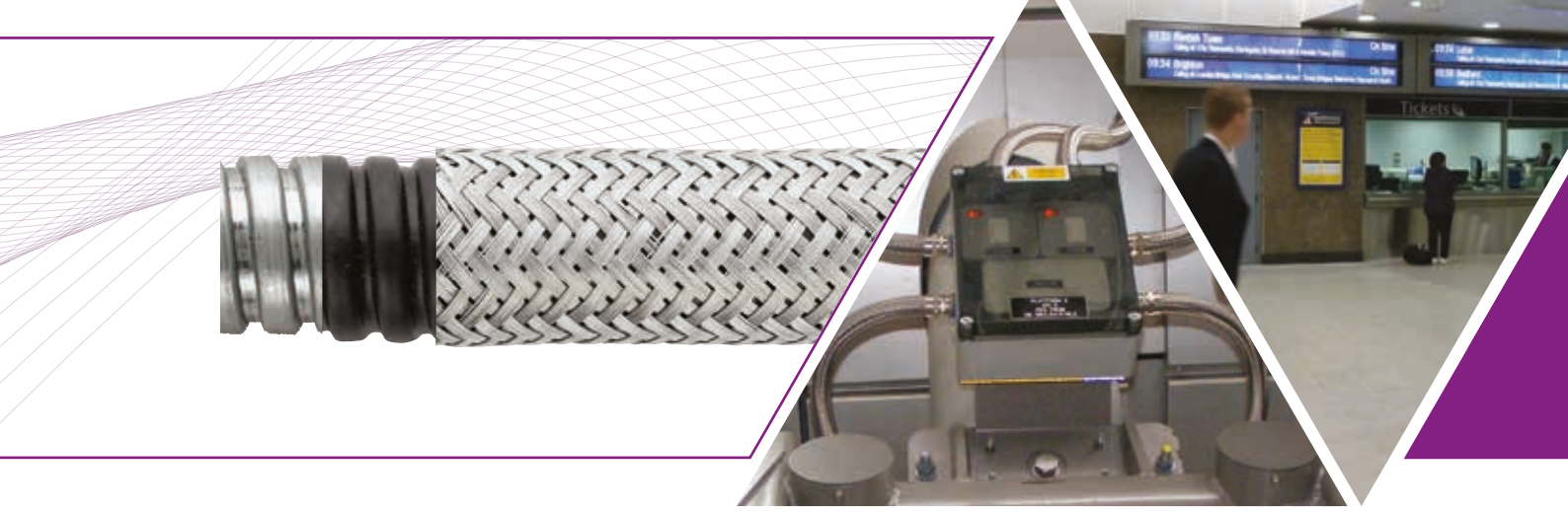
In addition, the flexible conduit meets all of Transport for London's fire requirements, with details listed on LUL product registration certificate no. 297. As a low fire hazard product, it is highly flame retardant, has low smoke emissions, low toxicity and is halogen free. It also provides EMC screening, which is vital for communications and signaling.











## Thameslink - Infrastructure Improvements



Linbrooke Services had specified and installed a flexible conduit system from Flexicon to protect power and data cabling for a passenger signage system as part of the Thameslink high capacity infrastructure improvements. The aim of the new system was to facilitate swift movement of passengers off and onto trains to minimise dwell time. It is vital in ensuring that people are on the right platform, at the right time and are standing in the right position.

There is signage in every area of the station to direct passengers to the correct platform and then screens right along the length of the platform to help spread passengers out for a 12 carriage train. It is part of a real time prediction system that uses data from a number of sources to accurately predict the arrival of trains, which is used to analyse what this means to the overall train service at a station and then communicate this to passengers so that they can plan their journey.

The company selected Flexicon's LFHUBRD metallic conduit, which has a galvanised steel core, extra low fire hazard coating and a stainless steel overbraid. It provides EMC screening for data cabling and with its high tensile strength, crush and abrasion resistance will resist any potential vandalism. Its stainless steel overbraid also makes the conduit visually attractive to the viewing public.

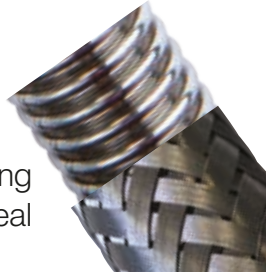
## Europe's Largest Infrastructure Project - Crossrail



The £14.8billion Crossrail project is Europe's largest infrastructure project and brings an extra 1.5million people to within 45 minutes of central London. Power and data is vital for operational efficiency and critical safety systems. With so many people using the new Elizabeth line, it is vital that the cabling is protected not just from day one but for the lifetime of the installation.

Cable protection from Flexicon is used for all lighting, small power, CCTV and audio systems in both the general public and back office areas and for the Platform Edge Screen (PES) that separates the station from the track area.

The main requirements for the cable protection system were to protect cabling from vandalism, provide ingress protection of up to IP68 and meet the stringent fire safety standards for sub-surface rail installations. For public facing areas the conduit had to also meet the aesthetic requirements of the installation.



Back office areas used Flexicon's new FSS stainless steel corrugated conduit. Public facing areas use either FSSBRD, which has a stainless steel over braid for added aesthetic appeal or the specially developed all metallic black stainless-steel conduit called FSS black.



# Infrastructure

Whether it is Passenger Information systems, Station Lighting, CCTV and Passenger Safety, Trackside power & signalling, train monitoring & information systems or tunnels, our products provide ideal Cable Protection for infrastructure and track related installations to ensure safety and reliability.



Ticket Machine



CCTV & Passenger Information Systems



Tickets & Barriers



Lifts & Escalators



Lighting



Advertising Screens



Platform Edge Screens



Rail Crossings

Trackside Points Machines



Trackside Signalling



Trackside Power



Tunnels



## Key considerations

- Operating environment
- Safety
- Service life expectation
- Ease of maintenance
- Standards & compliance



## Typical hazards & product considerations

- Fire Performance
- Ingress Protection
- Vibration & Shock Resistance
- Temperature
- Impact
- UV Resistance
- Strength to Weight ratio
- Flexibility
- Fatigue Life
- Abrasion Resistance
- Chemical resistance
- EMC





## Standards

EN 45545-2 HL3

NFPA 130

IRIS Certification ISO/TS 22163:2017

FM58347

RoHS

REACh

UNDERGROUND

NetworkRail

## Typical Products




- LTPLFH - LFH Coated Liquid Tight




- LFHU - LFH Coated Galvanised Steel




- FSS - Stainless Steel Corrugated




- FSSBRD - SS Corrugated with SS overbraid




- LFHUBRD - LFH Coated Galvanised Steel with SS Overbraid




- FPRSS - Stainless Steel Overbraid PA6 Corrugated




- LTPPU - Polyurethane Coated Liquid Tight




- FPR - PA6 Corrugated



# Infrastructure Applications

Passenger safety and operational integrity are vital characteristics of a modern rail network.

**We know and appreciate the various challenges involved in achieving compliance to the latest industry legislation, managing and controlling risk, making procurement more efficient whilst striving for continuous improvement across the entire railway system.**

## Security Systems (CCTV) & Lighting



**LFHUBRD Conduits**

- Galvanised Steel Conduit with Low Fire Hazard coating and a Stainless Steel overbraid offering excellent mechanical strength, EMC screening, Aesthetic appearance and good Ingress Protection.

EN 45545-2 HL3 | NFPA 130 | UNDERGROUND

78



## Lifts and People Movers (escalators)



**LFHU Conduits**

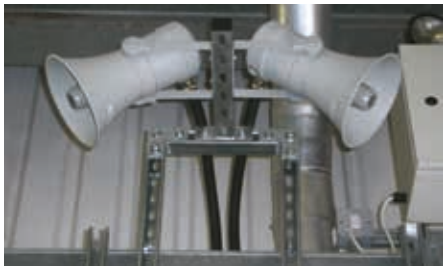
- Galvanised Steel Conduit with Low Fire Hazard coating offering excellent mechanical strength and good Ingress Protection.

EN 45545-2 HL3 | NFPA 130 | UNDERGROUND

70



## Passenger Information Systems



**LFHU Conduits**

- Galvanised Steel Conduit with Low Fire Hazard coating offering excellent mechanical strength and good Ingress Protection.

EN 45545-2 HL3 | NFPA 130 | UNDERGROUND

70





## Passenger Information



**FSS & FSSBRD Conduits**

- Stainless Steel Conduit offering inherent Fire Performance, high Ingress Protection and corrosion. Braided option also available for enhanced EMC screening.

EN 45545-2 HL3 NFPA 130 UNDERGROUND





80 80

## Trackside Signalling




**FPIH Conduits**

- Heavy duty PA12 conduit offering excellent UV resistance and high impact strength. Suitable for outdoor areas offering superior Ingress Protection, corrosion resistance and anti-vibration performance. Can be combined with FTCB to achieve EMC performance.
- For Network Rail approved Conduits and Fittings, see page 56

31



NetworkRail

## Tunnels



**FSS & FSSBRD Conduits**

- Stainless Steel Conduit offering inherent Fire Performance, high Ingress Protection and corrosion. Braided option also available for enhanced EMC screening.

EN 45545-2 HL3 NFPA 130 UNDERGROUND





80 80

## Ticketing



**LFHU Conduits**

- Galvanised Steel Conduit with Low Fire Hazard coating offering excellent mechanical strength and good Ingress Protection.

EN 45545-2 HL3 NFPA 130 UNDERGROUND

70






# Rail Infrastructure - Signalling Power Distribution Systems

"Use in new and upgraded Signalling Power Distribution Systems in accordance with NR/L2/SIGELP/27410"

## Benefits of Flexicon's unique offering for SIN 119

Safety and reliability of the Rail Infrastructure network is paramount. Network Rails ongoing challenge to achieve SIN 119 compliance has created the need for new solutions and techniques to remove potential dangers for the maintenance and management of 650V Signalling Power Distribution Systems in accordance with NR/L2/SIGELP/27410.

Flexible Conduit provides an ideal solution for new and existing equipment identified for upgrade and is fully compliant to NR/L2/SIGELP/27421 and NR/L2/SIGELP/27422 for use in Class II Based Signalling Power Distribution Systems.

NetworkRail
PA05/06589

### Flexible Conduit Systems

- Flexible Insulating Conduits with a dielectric withstand of 3.5kV in accordance with NR/L2/SIGELP/27421

### Conduit Glands

- Conduit Glands in accordance with NR/L2/SIGELP/27422
- Universal End of Line Gland
- True one piece

### Accessories

- Range of fixing accessories and mounting equipment for Flexible Conduits






UK

NetworkRail

PA05/06589





## Compliant Conduit

56 • NRFPAS

56 • NRFPAH

56 • NRFPR

57 • NRFPIH

57 • NRFPIHR

• NRFPADS

## Compliant Fittings and Accessories



58 • NRFPAU

58 • NRFPAU45

58 • NRFPAU

59 • NRFPAX-FPAX

60 • NRFPAU EOL

60 • NRFCL

59 • NRLDMPS

59 • NRLDMPS90

61 • NRFCLAMP

61 • NR FCLAMP KIT

60 • NRREC

61 • NRCC01

## Flexicon warrant resistance to UV degradation

Our range of Network Rail PADS approved products have been extensively tested to warrant that the product performance will not suffer from significant mechanical deterioration from ultra violet exposure for a period of 35 years in the UK from the purchase date of the product.

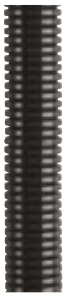
# Non-metallic conduit selection guide

IRIS Certification ISO/TS 22163:2017

| Conduit System | | FPAS | FPASC | FPR | FPAH | FPI | FPIH | FPIHR | FPADS |
|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | | | | | NEW | NEW |
| IP Rating | IP40 | | | | | | | | ● |
| | IP66 | ● | ● | ● | ● | ● | ● | ● | |
| | IP67 | ● | ● | ● | ● | ● | ● | ● | |
| | IP68 | ● | ● | ● | ● | ● | ● | ● | |
| | IP69 | ● | ● | ● | ● | ● | ● | ● | |
| Compression Strength (kg / 100mm) | | 75 | 95 | 75 | 120 | 45 | 60 | 60 | 60 |
| Pull Off Strength (kg) for 21/20mm size | | 40 | 40 | 40 | 70 | 30 | 50 | 35 | 15 |
| High Fatigue Life | | ● | ● | | | ● | ● | ● | |
| Temp | Max | 120˚C | 120˚C | 120˚C | 120˚C | 110˚C | 110˚C | 110˚C | 120˚C |
| | Min | -40˚C | -40˚C | -40˚C | -40˚C | -50˚C | -50˚C | -50˚C | -40˚C |
| Low Fire Hazard | ** Extra * Standard | * | * | ** | * | * | * | ** | |
| | Halogen Free | ● | ● | ● | ● | ● | ● | ● | ● |
| | Self Extinguishing | ● | ● | ● | ● | ● | ● | ● | ● |
| Fire Tests | EN 45545-2 | | | ● | | | | ● | |
| | NFPA-130 | | | ● | | | | ● | |
| | AS/NZS 1530.3 | ● | | ● | ● | | | | |
| Approvals | Network Rail NR/L2/ SIGELP/27421 | | | | | | | | |
| | TfL London Underground | | | ● | | | | | |
| | UL Approved | ● | ● | ● | ● | ● | ● | | |
| | Lloyds | ● | | ● | | | | | |
| Network Rail | UV Resistance (35 years UK) | | | | | | | | |
| | Suitable for areas prone to flood or immersion | | | | | | | | |
| | Suitable for Class II installations | | | | | | | | |
| | Dielectric strength 3.5kV | | | | | | | | |
| Abrasion Resistance | | ● | ● | ● | ● | ● | ● | ● | ● |
| Resistance to Solvents | | ● | ● | ● | ● | ● | ● | ● | ● |
| EMC Performance | | | | | | | | | |
| Page Number | | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 |

# Non-metallic conduit selection guide

IRIS Certification ISO/TS 22163:2017

| | FPRSS | FPRTC | FPISS | FPIHSS | FPIHRSS | FTCB | NRFPAS | NRFPR | NRFPAH | NRFPIH | NRFPIHR | NRFPADS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |   |  |  |  |  |  |  |  |
| | | | | | | | | | | | | ● |
| | | | | | | | ● | ● | ● | ● | ● | |
| | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | |
| | | | | | | | ● | ● | ● | ● | ● | |
| | | | | | | | ● | ● | ● | ● | ● | |
| | 75 | 75 | 45 | 60 | 60 | | 75 | 75 | 120 | 60 | 60 | 60 |
| | 100 | 75 | 100 | 100 | 100 | | 40 | 40 | 70 | 50 | 35 | 15 |
| | | | ● | ● | ● | | ● | | | ● | ● | |
| | 120˚C | 120˚C | 110˚C | 110˚C | 110˚C | 300˚C | 120°C | 120°C | 120°C | 110°C | 110°C | 120˚C |
| | -40˚C | -40˚C | -50˚C | -50˚C | -50˚C | -50˚C | -40°C | -40°C | -40°C | -50°C | -50°C | -40˚C |
| | EXTRA LOW FIRE HAZARD ** | EXTRA LOW FIRE HAZARD ** | STANDARD LOW FIRE HAZARD * | STANDARD LOW FIRE HAZARD * | EXTRA LOW FIRE HAZARD ** | INHERENT LOW FIRE HAZARD *** | STANDARD LOW FIRE HAZARD * | EXTRA LOW FIRE HAZARD ** | STANDARD LOW FIRE HAZARD * | STANDARD LOW FIRE HAZARD * | EXTRA LOW FIRE HAZARD ** | |
| | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | | | ● | ● | | ● | | | ● | |
| | ● | ● | | | ● | ● | | ● | | | ● | |
| | | | | | | | | | | | | |
| | | | | | | | ● | ● | ● | ● | ● | ● |
| | | | | | | | | ● | | | | |
| | | | | | | | ● | ● | ● | ● | | |
| | | | | | | | ● | ● | | | | |
| | | | | | | | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | ● | ● | |
| | | | | | | | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | ● | ● | |
| | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | | | | | | |
| | 52 | 52 | 52 | 52 | 52 | 54 | 56 | 56 | 56 | 57 | 57 | 57 |



Non-metallic systems are typically lighter, easier to work with and more cost effective to install. With advances in material technologies non-metallic systems can provide an alternative solution where typically only metal systems had been considered previously.

# Non-Metallic Conduits

## FPAS



**Construction:** Standard weight, flame retardant nylon (PA6) corrugated flexible conduit.

**Colour:** black or grey (RAL 7031). Orange available on request.*

**Typical Applications:** High levels of corrosion performance ideal for external applications such as passenger information systems & ticketing stations requiring a basic level of fire performance.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- Lloyd's Register Type Approval
- UL listed / UL recognised
- Low Fire Hazard (LFH), see page 8
- UL 94 V2 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant (black)
- Abrasion resistant
- Highly resistant to solvents and oils
- Slit version also available FPAS-S please contact us

## FPASC



**Construction:** Standard weight, flame retardant nylon (PA6) corrugated flexible conduit.

**Colour:** Black or Grey (RAL 7031).

**Typical Applications:** All types of machinery, public buildings where UL listed is a requirement.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- UL listed
- Lloyd's Register Type Approval
- Low Fire Hazard (LFH), see page 8
- UL 94 V2 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant (black)
- Abrasion resistant
- Highly resistant to solvents and oils

## FPR



**Construction:** Standard weight nylon (highly flame retardant PA6) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Interior Rolling Stock applications, tunnels and underground applications where extra low fire hazard performance is required.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- UL recognised
- Lloyd's Register Type Approval
- Extra Low Fire Hazard (LFH)
- Compliant to LUL Std 1-085 - APR 298
- UL 94 V0 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant
- Abrasion resistant
- Highly resistant to solvents and oils
- EN45545-HL3

## FPAH



**Construction:** Heavy weight, flame retardant, nylon (PA6) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Where high mechanical strength combined with high corrosion resistance is required with a basic level of fire performance suitable for external applications.

- High mechanical strength
- High impact resistance
- Temperature range -40˚C to +120˚C
- UL recognised
- Low Fire Hazard (LFH), see page 8
- UL 94 V2 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant
- Abrasion resistant
- Highly resistant to solvents and oils

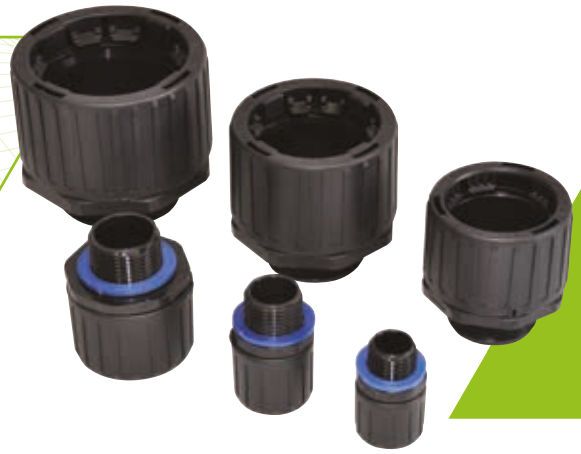
| european (NW) sizes | nominal size (mm) | pitch | FPAS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FPAS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FPR part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FPAH part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 10 | F | FPAS10 | 50 | 10.0 | 6.3 | 15 | | | | | | FPR10 | 50 | 10.0 | 6.3 | 15 | | | | | |
| 8 | 11 | F | FPAS11 | 50 | 11.5 | 8.2 | 20 | | | | | | | | | | | | | | | |
| 10 | 13 | F | FPAS13 | 25, 50 | 13.0 | 9.8 | 25 | | | | | | FPR13 | 50 | 13.0 | 9.8 | 25 | FPAH13 | 50 | 13.0 | 9.0 | 35 |
| 12 | 16 | F | FPAS16 | 25, 50 | 15.8 | 11.8 | 35 | | | | | | FPR16 | 50 | 15.8 | 11.8 | 35 | FPAH16 | 50 | 15.8 | 11.5 | 45 |
| 14 | 18 | F | FPAS18 | 50 | 18.5 | 14.2 | 40 | | | | | | | | | | | | | | | |
| | 20 | C | FPAS20 | 10, 25, 50 | 20.0 | 14.8 | 45 | | | | | | FPR20 | 50 | 20.0 | 14.8 | 45 | | | | | |
| 17 | 21 | F | FPAS21 | 10, 25, 50 | 21.2 | 16.7 | 45 | | | | | | FPR21 | 50 | 21.2 | 16.7 | 45 | | | | | |
| | 21 | C | | | | | | FPAS21C | 50 | 21.2 | 16.0 | 45 | | | | | FPAH21 | 50 | 21.2 | 15.5 | 55 |
| | 25 | C | FPAS25 | 10, 25, 50 | 25.0 | 19.1 | 50 | | | | | | FPR25 | 50 | 25.0 | 19.1 | 50 | | | | | |
| 23 | 28 | F | FPAS28 | 10, 25, 50 | 28.5 | 22.8 | 50 | | | | | | | | | | | | | | | |
| 23 | 28 | C | | | | | | FPAS28C | 50 | 28.5 | 21.7 | 50 | FPR28 | 50 | 28.5 | 21.7 | 50 | FPAH28 | 50 | 28.5 | 21.3 | 60 |
| 29 | 34 | C | FPAS34 | 25, 50 | 34.5 | 28.1 | 60 | FPAS34C | 50 | 34.5 | 28.1 | 60 | FPR34 | 50 | 34.5 | 28.1 | 60 | FPAH34 | 25 | 34.5 | 27.6 | 70 |
| 29 | 34 | F | FPAS34F* | 50 | 34.5 | 28.8 | 60 | | | | | | | | | | | | | | | |
| 36 | 42 | C | FPAS42 | 10, 25, 50 | 42.5 | 35.5 | 70 | FPAS42C | 25 | 42.5 | 35.5 | 70 | FPR42 | 25 | 42.5 | 35.5 | 70 | FPAH42 | 25 | 42.5 | 34.6 | 80 |
| 48 | 54 | C | FPAS54 | 10, 25, 50 | 54.5 | 47.2 | 80 | FPAS54C | 25 | 54.5 | 47.2 | 80 | FPR54 | 25 | 54.5 | 47.2 | 80 | FPAH54 | 25 | 54.5 | 46.0 | 90 |
| 56 | 67 | C | FPAS67 | 10 | 67.2 | 56.3 | 130 | FPAS67C | 10 | 67.2 | 56.3 | 130 | FPR67 | 10 | 67.2 | 56.3 | 130 | | | | | |

For larger diameter conduit see page 64

F = fine pitch C = coarse pitch

# FPA / FPAX / ULTRA™

Our range of non-metallic conduits below have been designed and engineered for use with our FPA, FPAX and ULTRA™ ranges of fittings.



## FPI

**Construction:** Standard weight nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Where continual movement or flexing is required, ideal for applications requiring a basic level of fire performance such as external CCTV.

- Highly flexible
- Exceptional fatigue life
- High impact resistance even at very low temperatures
- UV resistant
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- UL recognised
- Highly resistant to solvents and oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus free

## FPIH

**Construction:** Heavy weight nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Where continual movement or flexing is required, with a higher mechanical strength even at very low temperatures. Ideal for applications requiring a basic level of fire performance.

- Highly flexible and high fatigue life
- High mechanical strength
- High impact resistance even at very low temperatures
- Excellent UV resistance
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- UL recognised
- Highly resistant to solvents and oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus freeand oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus free

## FPIHR

**Construction:** Heavy weight nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Where continual movement or flexing is required, with a higher mechanical strength even at very low temperatures such as on Bogies or Intercar Jumper assemblies. Rolling Stock applications requiring a superior level of fire performance.

- Highly flexible and high fatigue life
- High mechanical strength
- High impact resistance even at very low temperatures
- Excellent UV resistance
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- UL recognised
- Highly resistant to solvents and oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus free
- EN45545-HL3

## FPADS

**Construction:** Double slit nylon (PA6) corrugated conduit.

**Colour:** Black.

**Typical Applications:** Retrofit and cable assemblies with pre-terminated plugs. Ideal to enhance personal protection against electric shock and protect vulnerable cabling within enclosures and Power Distribution Units.

- Made from 2 interlocking slit corrugated conduits
- Temperature range -40˚C to +120˚C
- Cables can be inserted laterally
- Provides abrasion resistance and routing of cables for static applications
- Self extinguishing
- Halogen, sulphur and phosphorus free
- UV resistant

EN 45545-2 HL3 NFPA 130

| FPI part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FPIH part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FPIHR part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FPADS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | european (NW) sizes | nominal size (mm) | pitch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | 7 | 10 | F |
| | | | | | | | | | | | | | | | FPADS11* | 50 | 11.5 | 6.2 | 70 | 8 | 11 | F |
| FPI13 | 50 | 13.0 | 9.8 | 25 | FPIH13 | 50 | 13.0 | 9.0 | 25 | FPIHR13 | 50 | 13.0 | 9.0 | 25 | FPADS13 | 50 | 13.0 | 7.9 | 75 | 10 | 13 | F |
| FPI16 | 50 | 15.8 | 11.8 | 30 | FPIH16 | 50 | 15.8 | 11.5 | 35 | FPIHR16 | 50 | 15.8 | 11.5 | 35 | FPADS16 | 50 | 15.8 | 10.3 | 100 | 12 | 16 | F |
| | | | | | | | | | | | | | | | | | | | | 14 | 18 | F |
| | | | | | | | | | | | | | | | | | | | | | 20 | C |
| FPI21 | 50 | 21.2 | 16.7 | 35 | | | | | | | | | | | FPADS21 | 50 | 21.2 | 13.9 | 120 | 17 | 21 | F |
| | | | | | FPIH21 | 50 | 21.2 | 15.0 | 45 | FPIHR21 | 50 | 21.2 | 15.0 | 45 | | | | | | | 21 | C |
| | | | | | | | | | | | | | | | | | | | | | 25 | C |
| | | | | | | | | | | | | | | | | | | | | 23 | 28 | F |
| FPI28 | 50 | 28.5 | 21.7 | 45 | FPIH28 | 50 | 28.5 | 21.3 | 50 | FPIHR28 | 50 | 28.5 | 21.3 | 50 | FPADS28 | 50 | 28.5 | 20.5 | 170 | 23 | 28 | C |
| FPI34 | 25 | 34.5 | 28.1 | 55 | FPIH34 | 25 | 34.5 | 27.6 | 60 | FPIHR34 | 25 | 34.5 | 27.6 | 60 | FPADS34 | 25 | 34.5 | 26.6 | 180 | 29 | 34 | C |
| | | | | | | | | | | | | | | | | | | | | 29 | 34 | F |
| FPI42 | 25 | 42.5 | 35.5 | 60 | FPIH42 | 25 | 42.5 | 34.6 | 70 | FPIHR42 | 25 | 42.5 | 34.6 | 70 | FPADS42 | 25 | 42.5 | 32.0 | 200 | 36 | 42 | C |
| FPI54 | 25 | 54.5 | 47.2 | 70 | FPIH54 | 25 | 54.5 | 46.0 | 80 | FPIHR54 | 25 | 54.5 | 46.0 | 80 | FPADS54 | 25 | 54.5 | 43.0 | 240 | 48 | 54 | C |
| FPI67 | 10 | 67.2 | 56.3 | 120 | | | | | | FPIHR67 | 10 | 67.2 | 56.0 | 130 | | | | | | 56 | 67 | C |

For larger diameter conduit see page 64



# **FPA system** nylon

**Construction:** Nylon (PA66) moulded fittings.

# **FPA system** brass threaded

**Construction:** Nylon (PA66) moulded fitting with nickel plated brass swivel thread.

**Colour:** Black or Grey.

IP66

EXTRA LOW FIRE HAZARD ★★

## Fittings

### FPA

**straight external thread**

One piece, fast fit, external threaded fitting. Suitable for knockouts or threaded entries.

IP66



### FPA

**straight UNEF swivel internal thread**

One piece, fast fit fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors.

IP66



### FPA

**flange**

One piece, fast fit fitting with nylon swivel flange with 'O' ring.

IP66



### FPA90

**90° elbow external thread**

One piece, fast fit, external threaded 90 degree elbow fitting. Suitable for knockouts.

IP66



| european (NW) sizes | nominal size (mm) | OD mm | Ext Metric | Ext PG | Ext NPT | Ext UNEF | Thread | Ext Flange | 90 Degree Metric | 90 Degree PG | 90 Degree NPT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | FPA10-M12 | FPA10-PG7 | | | | | FPA10-M12-90 | FPA10-PG7-90 | |
| 7 | 10 | | FPA10-M16 | FPA10-PG9 | | | | | | | |
| 8 | 11 | 11.5 | FPA11-M12 | FPA11-PG7 | | | | | FPA11-M12-90 | | |
| 10 | 13 | 13.0 | FPA13-M12 | FPA13-PG7 | | FPA13-BU063 | (5/8") | | FPA13-M16-90 | FPA13-PG9-90 | |
| 10 | 13 | | FPA13-M16 | FPA13-PG9 | | FPA13-BU075 | (3/4") | | | | |
| 10 | 13 | | FPA13-M20 | FPA13-PG11 | | FPA13-BU088 | (7/8") | | | | |
| 12 | 16 | 15.8 | FPA16-M16 | FPA16-PG9 | FPA16-038 | FPA16-BU075 | (3/4") | FPA16-FL | FPA16-M16-90 | FPA16-PG9-90 | FPA16-050-90 |
| 12 | 16 | | FPA16-M20 | FPA16-PG11 | FPA16-050 | FPA16-BU088 | (7/8") | | FPA16-M20-90 | FPA16-PG11-90 | |
| 12 | 16 | | | FPA16-PG13 | | FPA16-BU100 | (1") | | | FPA16-PG13-90 | |
| 12 | 16 | | | FPA16-PG16 | | FPA16-BU119 | (1 3/16") | | | | |
| 14 | 18 | 18.5 | FPA18-M20 | FPA18-PG13 | | | | | FPA18-M20-90 | | |
| 14 | 18 | | | | | | | | | | |
| | 20 | 20.0 | FPA20-M20 | | | | | | FPA20-M20-90 | | |
| 17 | 21 | 21.2 | FPA21-M20 | FPA21-PG13 | FPA21-050 | FPA21-BU100 | (1") | FPA21-FL | FPA21-M20-90 | FPA21-PG16-90 | FPA21-050-90 |
| 17 | 21 | | FPA21-M25 | FPA21-PG16 | | FPA21-BU119 | (1 3/16") | | | | |
| 17 | 21 | | | | | FPA21-BU125 | (1 1/4") | | | | |
| | 25 | 25.0 | FPA25-M25 | | | | | | FPA25-M25-90 | | |
| 23 | 28 | 28.5 | FPA28-M25 | FPA28-PG21 | FPA28-075 | FPA28-BU138 | (1 3/8") | FPA28-FL | FPA28-M25-90 | FPA28-PG21-90 | FPA28-075-90 |
| 23 | 28 | | FPA28-M32 | FPA28-PG29 | | FPA28-BU144 | (1 7/16") | | | | |
| 29 | 34 | 34.5 | FPA34-M32 | FPA34-PG29 | FPA34-100 | FPA34-BU144 | (1 7/16") | FPA34-FL | FPA34-M32-90 | FPA34-PG29-90 | FPA34-100-90 |
| 29 | 34 | | FPA34-M40 | | | FPA34-BU175 | (1 3/4") | | | | |
| 36 | 42 | 42.5 | FPA42-M40 | FPA42-PG36 | FPA42-125 | FPA42-BU200 | (2") | FPA42-FL | FPA42-M40-90 | FPA42-PG36-90 | FPA42-125-90 |
| 36 | 42 | | FPA42-M50 | | FPA42-150 | FPA42-BU225 | (2 1/4") | | FPA42-M50-90 | | FPA42-150-90 |
| 48 | 54 | 54.5 | FPA54-M50 | FPA54-PG42 | FPA54-150 | FPA54-BU200 | (2") | | FPA54-M50-90 | FPA54-PG48-90 | FPA54-150-90 |
| 48 | 54 | | FPA54-M63 | FPA54-PG48 | FPA54-200 | FPA54-BU225 | (2 1/4") | | FPA54-M63-90 | | FPA54-200-90 |
| 56 | 67 | 67.0 | FPA67-M63 | FPA67-PG48 | FPA67-200 | | | | FPA67-M63-90 | FPA67-PG48-90 | FPA67-200-90 |

## Ordering Notes

- Specify Black or Grey (B = Black, G = Grey) eg. FPA16-M16B
- The IP rating onto a UNEF threaded connector may be dependent on the design of the connector

* Indicates parts made to order on request and may be subject to MOQ and lead time

- **Available on request:**
  - additional sizes, alternative threads
  - additional UNEF threads and combinations

## properties

- 1 part fast fit
- IP rating: IP66
- Vibration & shock tested to EN61373 Cat 2
- Tamper resistant
- Can be removed using a screwdriver
- Both 90˚ & 45˚ elbows incorporate swept bore to facilitate cable installation & protect cables when installed
- All round teeth give high pull off strength 70kg with FPAH21
- Suitable for fine and coarse pitch conduits
- Temperature range -50˚C to +135˚C
- Low Fire Hazard (LFH), see page 149
- Halogen, sulphur and phosphorus free
- Available in Black or Grey (RAL 7031)
- EN 45545 HL3 and NFPA compliant
- Nylon metric threads supplied with glass reinforced nylon locknut
- Face seal washers available on request - see page 84

## FPA90

### 90° elbow UNEF swivel internal thread

One piece, fast fit, 90 degree elbow fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors.

IP66



## FPA90

### flange

One piece, fast fit 90 degree elbow fitting with nylon swivel flange with 'O' ring face seal.

IP66



## FPA45

### 45° elbow external thread

One piece, fast fit, external threaded 45 degree elbow fitting. Suitable for knockouts.

IP66



## FPA45

### 45° elbow UNEF swivel internal thread

One piece, fast fit, 45 degree elbow fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors.

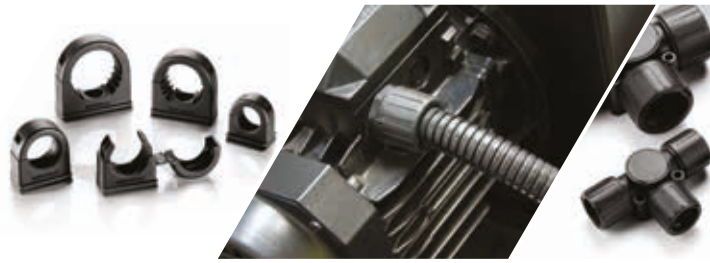
IP66

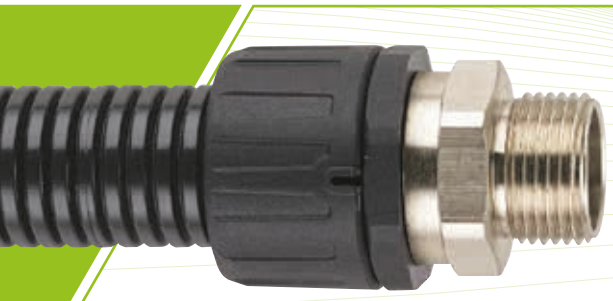


| 90 Degree UNEF | Thread | 90 Degree Flange | 45 Degree Metric | 45 Degree PG | 45 Degree NPT | 45 Degree UNEF | Thread | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 10 | 10.0 | 7 |
| | | | | | | | | 10 | | 7 |
| | | | | | | | | 11 | 11.5 | 8 |
| FPA13-BU063-90 | (5⁄8") | | | | | | | 13 | 13.0 | 10 |
| FPA13-BU075-90 | (3⁄4") | | | | | | | 13 | | 10 |
| FPA13-BU088-90 | (7⁄8") | | | | | | | 13 | | 10 |
| FPA16-BU075-90 | (3⁄4") | FPA16-FL-90 | FPA16-M20-45 | FPA16-PG13-45 | FPA16-050-45 | FPA16-BU075-45 | (3⁄4") | 16 | 15.8 | 12 |
| FPA16-BU088-90 | (7⁄8") | | | | | FPA16-BU088-45 | (7⁄8") | 16 | | 12 |
| FPA16-BU100-90 | (1") | | | | | FPA16-BU100-45 | (1") | 16 | | 12 |
| FPA16-BU119-90 | (1 3⁄16") | | | | | FPA16-BU119-45 | (1 3⁄16") | 16 | | 12 |
| | | | | | | | | 18 | 18.5 | 14 |
| | | | | | | | | 18 | | 14 |
| | | | | | | | | 20 | 20.0 | |
| FPA21-BU100-90 | (1") | FPA21-FL-90 | FPA21-M20-45 | FPA21-PG13-45 | FPA21-050-45 | FPA21-BU100-45 | (1") | 21 | 21.2 | 17 |
| FPA21-BU119-90 | (1 3⁄16") | | | FPA21-PG16-45 | | FPA21-BU119-45 | (1 3⁄16") | 21 | | 17 |
| FPA21-BU125-90 | (1 1⁄4") | | | | | FPA21-BU125-45 | (1 1⁄4") | 21 | | 17 |
| | | | | | | | | 25 | 25.0 | |
| FPA28-BU138-90 | (1 3⁄8") | FPA28-FL-90 | FPA28-M25-45 | FPA28-PG21-45 | FPA28-075-45 | FPA28-BU138-45 | (1 3⁄8") | 28 | 28.5 | 23 |
| FPA28-BU144-90 | (1 7⁄16") | | | | | FPA28-BU144-45 | (1 7⁄16") | 28 | | 23 |
| FPA34-BU144-90 | (1 7⁄16") | FPA34-FL-90 | FPA34-M32-45 | FPA34-PG29-45 | FPA34-100-45 | FPA34-BU144-45 | (1 7⁄16") | 34 | 34.5 | 29 |
| FPA34-BU175-90 | (1 3⁄4") | | | | | FPA34-BU175-45 | (1 3⁄4") | 34 | | 29 |
| FPA42-BU200-90 | (2") | FPA42-FL-90 | FPA42-M50-45 | FPA42-PG36-45 | FPA42-150-45 | FPA42-BU200-45 | (2") | 42 | 42.5 | 36 |
| FPA42-BU225-90 | (2 1⁄4") | | | | | FPA42-BU225-45 | (2 1⁄4") | 42 | | 36 |
| FPA54-BU200-90 | (2") | FPA54-FL-90* | FPA54-M50-45 | | FPA54-150-45 | FPA54-BU200-45 | (2") | 54 | 54.5 | 48 |
| FPA54-BU225-90 | (2 1⁄4") | | | | | FPA54-BU225-45 | (2 1⁄4") | 54 | | 48 |
| | | | | | | | | 67 | 67.0 | 56 |

## Standards & Approvals

IRIS Certification ISO/TS 22163:2017 · BS EN IEC 61386 · REACh · EN 45545-2 HL3 · RoHS · NFPA 130 · UNDERGROUND





# **FPA system** nylon

**Construction:** Nylon (PA66) moulded fittings.

# **FPA system** brass threaded

**Construction:** Nylon (PA66) moulded fitting with nickel plated brass swivel thread.

**Colour:** Black or Grey.

EXTRA LOW FIRE HAZARD ★★

IP66

## Fittings

### FPA45

**flange**

One piece, fast fit 45 degree elbow fitting with nylon swivel flange with 'O' ring face seal.

IP66



### FPA-FPA

**coupler**

One piece, fast fit, coupler to join corrugated conduits. Also available in FPAX and FPAU versions.

IP66



### FPA-MPC

**coupler**

One piece, fast fit, coupler to join corrugated conduit to rigid conduit.

IP66



| european (NW) sizes | nominal size (mm) | OD mm | 45 Degree Flange | Coupler | Rigid Conduit Coupler |
|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | |
| 7 | 10 | | | | |
| 8 | 11 | 11.5 | | | |
| 10 | 13 | 13.0 | | | |
| 10 | 13 | | | | |
| 10 | 13 | | | | |
| 12 | 16 | 15.8 | FPA16-FL-45 | FPA16-FPA16 | FPA16-MPC16 |
| 12 | 16 | | | | |
| 12 | 16 | | | | |
| 12 | 16 | | | | |
| 14 | 18 | 18.5 | | | |
| 14 | 18 | | | | |
| | 20 | 20.0 | | FPA20-FPA20 | |
| 17 | 21 | 21.2 | FPA21-FL-45 | FPA21-FPA21 | FPA21-MPC20 |
| 17 | 21 | | | | |
| 17 | 21 | | | | |
| | 25 | 25.0 | | FPA25-FPA25 | |
| 23 | 28 | 28.5 | FPA28-FL-45 | FPA28-FPA28 | FPA28-MPC25 |
| 23 | 28 | | | | |
| 29 | 34 | 34.5 | FPA34-FL-45 | FPA34-FPA34 | FPA34-MPC32 |
| 29 | 34 | | | | |
| 36 | 42 | 42.5 | FPA42-FL-45 | FPA42-FPA42 | FPA42-MPC40 |
| 36 | 42 | | | | |
| 48 | 54 | 54.5 | FPA54-FL-45 | FPA54-FPA54 | |
| 48 | 54 | | | | |
| 56 | 67 | 67.0 | | | |

## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass

- **Available on request:**
  - colour Grey, other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version see page 55



## properties

- 1 part fast fit
- IP rating: IP66
- Vibration & shock tested to EN61373 Cat 2
- Tamper resistant
- Can be removed using a screwdriver
- Both 90˚ & 45˚ elbows incorporate swept bore to facilitate cable installation & protect cables when installed
- All round teeth give high pull off strength 70kg with FPAH21
- Suitable for fine and coarse pitch conduits
- Temperature range -50˚C to +135˚C
- Low Fire Hazard (LFH), see page 8
- Halogen, sulphur and phosphorus free
- Available in Black or Grey (RAL 7031)
- EN 45545 HL3 and NFPA compliant



## FPA

**straight swivel brass external thread**

One piece, fast fit, swivel, nickel plated brass external threaded fitting. Suitable for knockouts or threaded entries.

IP66



## FPA

**straight swivel brass internal thread**

One piece, fast fit, swivel, nickel plated brass internal threaded fitting.

IP66



## FPA90

**90° elbow swivel brass external thread**

One piece, fast fit, swivel, 90 degree elbow, nickel plated brass external threaded fitting. Suitable for knockouts or threaded entries.

IP66



| NPB Ext Metric | NPB Ext PG | NPB Int Metric | NPB Ext Metric | NPB Ext PG | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|---|---|
| | | | | | 10 | 10.0 | 7 |
| | | | | | 10 | | 7 |
| | | | | | 11 | 11.5 | 8 |
| FPA13-BM16 | FPA13-BPG9 | FPA13-BFM16 | FPA13-BM16-90 | FPA13-BPG9-90 | 13 | 13.0 | 10 |
| | | | | | 13 | | 10 |
| | | | | | 13 | | 10 |
| FPA16-BM16 | FPA16-BPG9 | FPA16-BFM16 | FPA16-BM16-90 | FPA16-BPG9-90 | 16 | 15.8 | 12 |
| FPA16-BM20 | FPA16-BPG11 | FPA16-BFM20 | FPA16-BM20-90 | FPA16-BPG11-90 | 16 | | 12 |
| | | | | | 16 | | 12 |
| | | | | | 16 | | 12 |
| | | | | | 18 | 18.5 | 14 |
| | | | | | 18 | | 14 |
| | | | | | 20 | 20.0 | |
| FPA21-BM20 | FPA21-BPG13 | FPA21-BFM20 | FPA21-BM20-90 | FPA21-BPG13-90 | 21 | 21.2 | 17 |
| | FPA21-BPG16 | | | FPA21-BPG16-90 | 21 | | 17 |
| | | | | | 21 | | 17 |
| | | | | | 25 | 25.0 | |
| FPA28-BM25 | FPA28-BPG21 | FPA28-BFM25 | FPA28-BM25-90 | FPA28-BPG21-90 | 28 | 28.5 | 23 |
| | | | | | 28 | | 23 |
| FPA34-BM32 | FPA34-BPG29 | FPA34-BFM32 | FPA34-BM32-90 | FPA34-BPG29-90 | 34 | 34.5 | 29 |
| | | | | | 34 | | 29 |
| FPA42-BM40 | FPA42-BPG36 | FPA42-BFM40 | FPA42-BM40-90 | FPA42-BPG36-90 | 42 | 42.5 | 36 |
| FPA42-BM50 | | | FPA42-BM50-90 | | 42 | | 36 |
| FPA54-BM50 | FPA54-BPG48* | FPA54-BFM50 | FPA54-BM50-90 | FPA54-BPG48-90* | 54 | 54.5 | 48 |
| FPA54-BM63 | | | FPA54-BM63-90 | | 54 | | 48 |
| FPA67-BM63 | | | | | 67 | 67.0 | 56 |

## Standards & Approvals

BS EN IEC 61386

ISO/TS 22163:2017





# **FPA** system
## brass threaded

**Construction:** Nylon (PA66) moulded fitting with nickel plated brass swivel thread.

**Colour:** Black or Grey.

EXTRA LOW FIRE HAZARD ★★

IP66

## Fittings

### FPA90

**90° elbow swivel brass internal thread**

One piece, fast fit, swivel, 90 degree elbow, nickel plated brass internal threaded fitting.

IP66



### FPA45

**45° elbow swivel brass external thread**

One piece, fast fit, swivel, 45 degree elbow, nickel plated brass external threaded fitting. Suitable for knockouts or threaded entries.

IP66



### FPA45

**45° elbow swivel brass internal thread**

One piece, fast fit, swivel, 45 degree elbow, nickel plated brass internal threaded fitting.

IP66



| european (NW) sizes | nominal size (mm) | OD mm | NPB Int Metric | NPB Ext Metric | NPB Ext PG | NPB Int Metric |
|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | |
| 7 | 10 | | | | | |
| 8 | 11 | 11.5 | | | | |
| 10 | 13 | 13.0 | FPA13-BFM16-90 | | | |
| 10 | 13 | | | | | |
| 10 | 13 | | | | | |
| 12 | 16 | 15.8 | FPA16-BFM16-90 | FPA16-BM16-45 | FPA16-BPG13-45 | FPA16-BFM20-45 |
| 12 | 16 | | FPA16-BFM20-90 | FPA16-BM20-45 | FPA16-BPG16-45 | |
| 12 | 16 | | | | | |
| 12 | 16 | | | | | |
| 14 | 18 | 18.5 | | | | |
| 14 | 18 | | | | | |
| | 20 | 20.0 | | | | |
| 17 | 21 | 21.2 | FPA21-BFM20-90 | FPA21-BM20-45 | FPA21-BPG13-45 | FPA21-BFM20-45 |
| 17 | 21 | | | | FPA21-BPG16-45 | |
| 17 | 21 | | | | | |
| | 25 | 25.0 | | | | |
| 23 | 28 | 28.5 | FPA28-BFM25-90 | FPA28-BM25-45 | FPA28-BPG21-45 | FPA28-BFM25-45 |
| 23 | 28 | | | | | |
| 29 | 34 | 34.5 | FPA34-BFM32-90 | FPA34-BM32-45 | FPA34-BPG29-45 | FPA34-BFM32-45 |
| 29 | 34 | | | | | |
| 36 | 42 | 42.5 | FPA42-BFM50-90 | FPA42-BM40-45 | FPA42-BPG36-45 | FPA42-BFM50-45 |
| 36 | 42 | | | FPA42-BM50-45 | | |
| 48 | 54 | 54.5 | FPA54-BFM50-90 | FPA54-BM50-45 | FPA54-BPG48-45* | FPA54-BFM50-45 |
| 48 | 54 | | | FPA54-BM63-45 | | |
| 56 | 67 | 67.0 | | | | |

## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass

- **Available on request:**
  - colour Grey, other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version, see page 55



## properties

- 1 part fast fit
- IP rating: **of conduit & fitting: IP66 of cable gland: IP68 (10 bar)+IP69**
- Vibration & shock tested to EN61373 Cat 2
- Tamper resistant
- Can be removed using a screwdriver
- All round teeth give high pull off strength 70kg with FPAH21
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Suitable for fine and coarse pitch conduits
- Temperature range: **conduit fitting: -50˚C to +135˚C cable gland: -40˚C to +100˚C static -20˚C to +100˚C dynamic**
- Low Fire Hazard (LFH), see page 8
- Halogen, sulphur and phosphorus free
- **Refer to accessories for clamping range page 85**



## FPA

**cable gland**

One piece, fast fit, swivel, nickel plated brass external threaded cable gland fitting. Suitable for knockouts or threaded entries.

IP66



NPB Metric

## FPA90

**cable gland**

One piece, fast fit, swivel, 90 degree elbow, nickel plated brass external threaded cable gland fitting. Suitable for knockouts or threaded entries.

IP66



NPB Metric

## FPA45

**cable gland**

One piece, fast fit, swivel, 45 degree elbow, nickel plated brass external threaded cable gland fitting. Suitable for knockouts or threaded entries.

IP66



NPB Metric

| nominal size (mm) | OD mm | european (NW) sizes | FPA | FPA90 | FPA45 |
|---|---|---|---|---|---|
| 10 | 10.0 | 7 | | | |
| 10 | | 7 | | | |
| 11 | 11.5 | 8 | | | |
| 13 | 13.0 | 10 | FPA13-BM16-CG | FPA13-BM16-CG-90 | |
| 13 | | 10 | | | |
| 13 | | 10 | | | |
| 16 | 15.8 | 12 | FPA16-BM16-CG<br>FPA16-BM20-CG | FPA16-BM16-CG-90<br>FPA16-BM20-CG-90 | FPA16-BM20-CG-45 |
| 16 | | 12 | | | |
| 16 | | 12 | | | |
| 16 | | 12 | | | |
| 18 | 18.5 | 14 | | | |
| 18 | | 14 | | | |
| 20 | 20.0 | | | | |
| 21 | 21.2 | 17 | FPA21-BM20-CG | FPA21-BM20-CG-90 | FPA21-BM20-CG-45 |
| 21 | | 17 | | | |
| 21 | | 17 | | | |
| 25 | 25.0 | | | | |
| 28 | 28.5 | 23 | FPA28-BM25-CG | FPA28-BM25-CG-90 | FPA28-BM25-CG-45 |
| 28 | | 23 | | | |
| 34 | 34.5 | 29 | FPA34-BM32-CG | FPA34-BM32-CG-90 | FPA34-BM32-CG-45 |
| 34 | | 29 | | | |
| 42 | 42.5 | 36 | FPA42-BM40-CG | FPA42-BM40-CG-90 | FPA42-BM40-CG-45 |
| 42 | | 36 | | | |
| 54 | 54.5 | 48 | FPA54-BM50-CG | FPA54-BM50-CG-90 | FPA54-BM50-CG-45 |
| 54 | | 48 | | | |
| 67 | 67.0 | 56 | | | |

Note: PG thread versions and EMC Cable Gland version on request.

## Standards & Approvals

BS EN IEC 61386

ISO/TS 22163:2017





# **FPAX** system nylon

**Construction:** Nylon (PA66) moulded fitting incorporating internal elastomeric seal.

**Colour:** Black or Grey* on request

EXTRA LOW FIRE HAZARD ★★ IP66 IP67 IP68 IP69

## Fittings

### FPAX

**straight external thread**

Fast fit, external threaded fitting with additional conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



### FPAX - FPAX

**coupler**

Fast fit coupler to join corrugated conduits. Also available in FPA and FPAU versions.

IP66 IP67 IP68 IP69



### FPAX

**straight UNEF swivel internal thread**

Fast fit fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors with additional conduit seal.

IP66 IP67 IP68 IP69



### FPAX

**flange**

Fast fit fitting with nylon swivel flange with additional conduit seal and with 'O' ring face seal.

IP66 IP67 IP68 IP69



| european (NW) sizes | nominal size (mm) | OD mm | Ext Metric | Ext PG | Ext NPT | | Int UNEF | Thread | Flange |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | | | | |
| 7 | 10 | | | | | | | | |
| 8 | 11 | 11.5 | | | | | | | |
| 10 | 13 | 13.0 | FPAX13-M16 | FPAX13-PG9 | | FPAX16-FPAX16 | | | |
| 10 | 13 | | | | | | | | |
| 10 | 13 | | | | | | | | |
| 12 | 16 | 15.8 | FPAX16-M16 | FPAX16-PG9 | FPAX16-038 | | FPAX16-BU075 | (¾") | FPAX16-FL |
| 12 | 16 | | FPAX16-M20 | FPAX16-PG11 | FPAX16-050 | | FPAX16-BU088 | (⅞") | |
| 12 | 16 | | | FPAX16-PG13 | | | FPAX16-BU100 | (1") | |
| 12 | 16 | | | FPAX16-PG16 | | | FPAX16-BU119 | (1 3/16") | |
| 14 | 18 | 18.5 | | | | | | | |
| 14 | 18 | | | | | | | | |
| | 20 | 20.0 | | | | | | | |
| 17 | 21 | 21.2 | FPAX21-M20 | FPAX21-PG13 | FPAX21-050 | FPAX21-FPAX21 | FPAX21-BU100 | (1") | FPAX21-FL |
| 17 | 21 | | | FPAX21-PG16 | | | FPAX21-BU119 | (1 3/16") | |
| 17 | 21 | | | | | | FPAX21-BU125 | (1⅜") | |
| | 25 | 25.0 | | | | | | | |
| 23 | 28 | 28.5 | FPAX28-M25 | FPAX28-PG21 | FPAX28-075 | FPAX28-FPAX28 | FPAX28-BU138 | (1⅜") | FPAX28-FL |
| 23 | 28 | | FPAX28-M32 | FPAX28-PG29 | | | FPAX28-BU144 | (1 7/16") | |
| 29 | 34 | 34.5 | FPAX34-M32 | FPAX34-PG29 | FPAX34-100 | FPAX34-FPAX34 | FPAX34-BU144 | (1 7/16") | FPAX34-FL |
| 29 | 34 | | FPAX34-M40 | | | | | | |
| 36 | 42 | 42.5 | FPAX42-M40 | FPAX42-PG36 | FPAX42-125 | FPAX42-FPAX42 | FPAX42-BU200 | (2") | FPAX42-FL |
| 36 | 42 | | FPAX42-M50 | | FPAX42-150 | | FPAX42-BU225 | (2¼") | |
| 48 | 54 | 54.5 | FPAX54-M50 | FPAX54-PG42 | FPAX54-150 | FPAX54-FPAX54 | FPAX54-BU200 | (2") | |
| 48 | 54 | | FPAX54-M63 | FPAX54-PG48 | FPAX54-200 | | FPAX54-BU225 | (2¼") | |
| 56 | 67 | 67.0 | FPAX67-M63 | | FPAX67-200 | | | | |

## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass

- **Available on request:**
  - other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version see page 55



## properties

- Fast fit
- IP rating:
  IP66 + IP67 + IP68 (2 bar) + IP69
- Supplied with additional conduit seal and face seal
- Face seal details:
  - **Metric Nylon threads supplied with retained Polyester Elastomer Washer**
  - **NPT and PG Nylon threads supplied with Neoprene Washer**
  - **Brass threads supplied with Fibre Washer**
  - **UNEF, Flange and Cable Glands supplied with O-ring**
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Can be removed using a screwdriver
- All round teeth give high pull off strength 70kg with FPAH21
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Suitable for fine and coarse pitch conduits
- Temperature range -50˚C to +135˚C
- **Metric nylon threads supplied complete with glass reinforced nylon locknuts**
- **Swivel UNEF threads allow assembly to military style electrical connectors without twisting of cables and includes sealing 'O' ring face seal**
- Low Fire Hazard (LFH), see page 8
- Halogen, sulphur and phosphorus free
- EN 45545 HL3 and NFPA130 compliant

## FPAX90

### 90° elbow external thread

Fast fit, external threaded 90 degree elbow fitting with additional conduit seal. Suitable for knockouts.

IP66 IP67 IP68 IP69



## FPAX90

### 90° elbow UNEF swivel internal thread

Fast fit, 90 degree elbow fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors with additional conduit seal.

IP66 IP67 IP68 IP69



## FPAX90

### flange

Fast fit 90 degree elbow fitting with nylon swivel flange with additional conduit seal with 'O' ring face seal.

IP66 IP67 IP68 IP69



| Ext Metric | Ext PG | Ext NPT | Int UNEF | Thread | Flange | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 10 | 10.0 | 7 |
| | | | | | | 10 | | 7 |
| | | | | | | 11 | 11.5 | 8 |
| FPAX13-M16-90 | FPAX13-PG9-90 | | | | | 13 | 13.0 | 10 |
| | | | | | | 13 | | 10 |
| | | | | | | 13 | | 10 |
| FPAX16-M16-90 | FPAX16-PG9-90 | FPAX16-050-90 | FPAX16-BU075-90 | (¾") | FPAX16-FL-90 | 16 | 15.8 | 12 |
| FPAX16-M20-90 | FPAX16-PG11-90 | | FPAX16-BU088-90 | (⅞") | | 16 | | 12 |
| | FPAX16-PG13-90 | | FPAX16-BU100-90 | (1") | | 16 | | 12 |
| | | | FPAX16-BU119-90 | (1 3/16") | | 16 | | 12 |
| | | | | | | 18 | 18.5 | 14 |
| | | | | | | 18 | | 14 |
| | | | | | | 20 | 20.0 | |
| FPAX21-M20-90 | FPAX21-PG13-90 | FPAX21-050-90 | FPAX21-BU100-90 | (1") | FPAX21-FL-90 | 21 | 21.2 | 17 |
| | FPAX21-PG16-90 | | FPAX21-BU119-90 | (1 3/16") | | 21 | | 17 |
| | | | FPAX21-BU125-90 | (1¼") | | 21 | | 17 |
| | | | | | | 25 | 25.0 | |
| FPAX28-M25-90 | FPAX28-PG21-90 | FPAX28-075-90 | FPAX28-BU138-90 | (1⅜") | FPAX28-FL-90 | 28 | 28.5 | 23 |
| | | | FPAX28-BU144-90 | (1 7/16") | | 28 | | 23 |
| FPAX34-M32-90 | FPAX34-PG29-90 | FPAX34-100-90 | FPAX34-BU144-90 | (1 7/16") | FPAX34-FL-90 | 34 | 34.5 | 29 |
| | | | | | | 34 | | 29 |
| FPAX42-M40-90 | FPAX42-PG36-90 | FPAX42-125-90 | FPAX42-BU200-90 | (2") | FPAX42-FL-90 | 42 | 42.5 | 36 |
| FPAX42-M50-90 | | FPAX42-150-90 | FPAX42-BU225-90 | (2¼") | | 42 | | 36 |
| FPAX54-M50-90 | FPAX54-PG48-90 | FPAX54-150-90 | FPAX54-BU200-90 | (2") | | 54 | 54.5 | 48 |
| FPAX54-M63-90 | | FPAX54-200-90 | FPAX54-BU225-90 | (2¼") | | 54 | | 48 |
| | | | | | | 67 | 67.0 | 56 |

## Standards & Approvals

ISO/TS 22163:2017 · BS EN IEC 61386







# **FPAX** system
## nylon & brass threaded

EXTRA LOW FIRE HAZARD ★★

**Construction:** Nylon (PA66) moulded fitting incorporating internal elastomeric seal.

**Construction:** Nylon (PA66) moulded fitting with swivel metal thread. External and internal metallic threads are made from nickel plated brass and incorporate an internal elastomeric seal.

**Colour:** Black or Grey* on request.

# Fittings

### FPAX45

**45° elbow external thread**

Fast fit, external threaded 45 degree elbow fitting with additional conduit seal. Suitable for knockouts.

IP66 IP67 IP68 IP69



### FPAX45

**45° elbow UNEF swivel internal thread**

Fast fit, 45 degree elbow fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors with additional conduit seal.

IP66 IP67 IP68 IP69



### FPAX45

**flange**

Fast fit 45 degree elbow fitting with nylon swivel flange with additional conduit seal and 'O' ring face seal.

IP66 IP67 IP68 IP69



| european (NW) sizes | nominal size (mm) | OD mm | Ext Metric | Ext PG | Ext NPT | Int UNEF | Thread | Flange |
|---|---|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | | | |
| 7 | 10 | | | | | | | |
| 8 | 11 | 11.5 | | | | | | |
| 10 | 13 | 13.0 | | | | | | |
| 10 | 13 | | | | | | | |
| 10 | 13 | | | | | | | |
| 12 | 16 | 15.8 | FPAX16-M20-45 | FPAX16-PG13-45 | FPAX16-050-45 | FPAX16-BU075-45 | (¾") | FPAX16-FL-45 |
| 12 | 16 | | | | | FPAX16-BU088-45 | (⅞") | |
| 12 | 16 | | | | | FPAX16-BU100-45 | (1") | |
| 12 | 16 | | | | | FPAX16-BU119-45 | (1 3/16") | |
| 14 | 18 | 18.5 | | | | | | |
| 14 | 18 | | | | | | | |
| | 20 | 20.0 | | | | | | |
| 17 | 21 | 21.2 | FPAX21-M20-45 | FPAX21-PG13-45 | FPAX21-050-45 | FPAX21-BU100-45 | (1") | FPAX21-FL-45 |
| 17 | 21 | | | FPAX21-PG16-45 | | FPAX21-BU119-45 | (1 3/16") | |
| 17 | 21 | | | | | FPAX21-BU125-45 | (1¼") | |
| | 25 | 25.0 | | | | | | |
| 23 | 28 | 28.5 | FPAX28-M25-45 | FPAX28-PG21-45 | FPAX28-075-45 | FPAX28-BU138-45 | (1⅜") | FPAX28-FL-45 |
| 23 | 28 | | | | | FPAX28-BU144-45 | (1 7/16") | |
| 29 | 34 | 34.5 | FPAX34-M32-45 | FPAX34-PG29-45 | FPAX34-100-45 | FPAX34-BU144-45 | (1 7/16") | FPAX34-FL-45 |
| 29 | 34 | | | | | | | |
| 36 | 42 | 42.5 | FPAX42-M50-45 | FPAX42-PG36-45 | FPAX42-150-45 | FPAX42-BU200-45 | (2") | FPAX42-FL-45 |
| 36 | 42 | | | | | FPAX42-BU225-45 | (2¼") | |
| 48 | 54 | 54.5 | FPAX54-M50-45 | | FPAX54-150-45 | FPAX54-BU200-45 | (2") | |
| 48 | 54 | | | | | FPAX54-BU225-45 | (2¼") | |
| 56 | 67 | 67.0 | | | | | | |

# Ordering Notes

- Specify Black or Grey (B=Black, G=Grey) eg: FPAX16-M20-45B
- NPB = Nickel Plated Brass

- **Available on request:**
  - other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version, see page 55



## properties

- Fast fit
- IP rating: IP66 + IP67 + IP68 (2 bar) + IP69
- Supplied with additional conduit seal and face seal
- Face seal details:
  - **Metric Nylon threads supplied with retained Polyester Elastomer Washer**
  - **NPT and PG Nylon threads supplied with Neoprene Washer**
  - **Brass threads supplied with Fibre Washer**
  - **UNEF, Flange and Cable Glands supplied with O-ring**
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Can be removed using a screwdriver
- All round teeth give high pull off strength 70kg with FPAH21
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Suitable for fine and coarse pitch conduits
- Temperature range -50˚C to +135˚C
- **Metric nylon threads supplied complete with glass reinforced nylon locknuts**
- **Swivel UNEF threads allow assembly to military style electrical connectors without twisting of cables and includes sealing 'O' ring face seal**
- Low Fire Hazard (LFH), see page 8
- Halogen, sulphur and phosphorus free
- EN 45545 HL3 and NFPA130 compliant

## FPAX

### straight swivel brass external thread

Fast fit, swivel, nickel plated brass external threaded fitting. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



## FPAX

### straight swivel brass internal thread

Fast fit, swivel, nickel plated brass internal threaded fitting with additional conduit seal.

IP66 IP67 IP68 IP69



## FPAX90

### 90° elbow swivel brass external thread

Fast fit, swivel, 90 degree elbow, nickel plated brass external threaded fitting with additional conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69

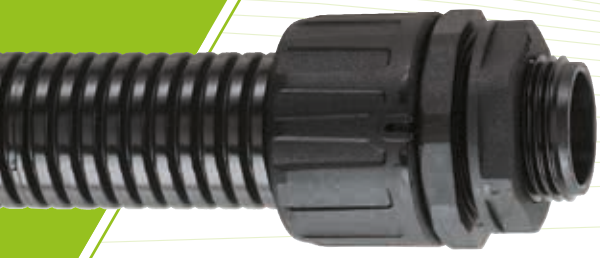


| NPB Ext Metric | NPB Ext PG | NPB Int Metric | NPB Ext Metric | NPB Ext PG | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|---|---|
| | | | | | 10 | 10.0 | 7 |
| | | | | | 10 | | 7 |
| | | | | | 11 | 11.5 | 8 |
| FPAX13-BM16 | FPAX13-BPG9 | FPAX13-BFM16 | FPAX13-BM16-90 | FPAX13-BPG9-90 | 13 | 13.0 | 10 |
| | | | | | 13 | | 10 |
| | | | | | 13 | | 10 |
| FPAX16-BM16 | FPAX16-BPG9 | FPAX16-BFM16 | FPAX16-BM16-90 | FPAX16-BPG9-90 | 16 | 15.8 | 12 |
| FPAX16-BM20 | FPAX16-BPG11 | FPAX16-BFM20 | FPAX16-BM20-90 | FPAX16-BPG11-90 | 16 | | 12 |
| | | | | | 16 | | 12 |
| | | | | | 16 | | 12 |
| | | | | | 18 | 18.5 | 14 |
| | | | | | 18 | | 14 |
| | | | | | 20 | 20.0 | |
| FPAX21-BM20 | FPAX21-BPG13 | FPAX21-BFM20 | FPAX21-BM20-90 | FPAX21-BPG13-90 | 21 | 21.2 | 17 |
| | FPAX21-BPG16 | | | FPAX21-BPG16-90 | 21 | | 17 |
| | | | | | 21 | | 17 |
| | | | | | 25 | 25.0 | |
| FPAX28-BM25 | FPAX28-BPG21 | FPAX28-BFM25 | FPAX28-BM25-90 | FPAX28-BPG21-90 | 28 | 28.5 | 23 |
| | | | | | 28 | | 23 |
| FPAX34-BM32 | FPAX34-BPG29 | FPAX34-BFM32 | FPAX34-BM32-90 | FPAX34-BPG29-90 | 34 | 34.5 | 29 |
| | | | | | 34 | | 29 |
| FPAX42-BM40 | FPAX42-BPG36 | FPAX42-BFM40 | FPAX42-BM40-90 | FPAX42-BPG36-90 | 42 | 42.5 | 36 |
| FPAX42-BM50 | | | FPAX42-BM50-90 | | 42 | | 36 |
| FPAX54-BM50 | FPAX54-BPG48* | FPAX54-BFM50 | FPAX54-BM50-90 | FPAX54-BPG48-90* | 54 | 54.5 | 48 |
| FPAX54-BM63 | | | FPAX54-BM63-90 | | 54 | | 48 |
| | | | | | 67 | 67.0 | 56 |

## Standards & Approvals

IRIS Certification ISO/TS 22163:2017 · BS EN IEC 61386 · CE · RoHS · NFPA 130 · UNDERGROUND





# **FPAX system** brass threaded

**Construction:** Nylon (PA66) moulded fitting with swivel metal thread. External and internal metallic threads are made from nickel plated brass and incorporate an internal elastomeric seal.

**Colour:** Black.

EXTRA LOW FIRE HAZARD ★★ IP66 IP67 IP68 IP69

## Fittings

### FPAX90

**90° elbow swivel brass internal thread**

Fast fit, swivel, 90 degree elbow, nickel plated brass internal threaded fitting with additional conduit seal.

IP66 IP67 IP68 IP69



### FPAX45

**45° elbow swivel brass external thread**

Fast fit, swivel, 45 degree elbow, nickel plated brass external threaded fitting with additional conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



### FPAX45

**45° elbow swivel brass internal thread**

Fast fit, swivel, 45 degree elbow, nickel plated brass internal threaded fitting with additional conduit seal.

IP66 IP67 IP68 IP69



| european (NW) sizes | nominal size (mm) | OD mm | NPB Int Metric | NPB Ext Metric | NPB Ext PG | NPB Int Metric |
|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | |
| 7 | 10 | | | | | |
| 8 | 11 | 11.5 | | | | |
| 10 | 13 | 13.0 | FPAX13-BFM16-90 | | | |
| 10 | 13 | | | | | |
| 10 | 13 | | | | | |
| 12 | 16 | 15.8 | FPAX16-BFM16-90 | FPAX16-BM16-45 | FPAX16-BPG13-45 | FPAX16-BFM20-45 |
| 12 | 16 | | FPAX16-BFM20-90 | FPAX16-BM20-45 | FPAX16-BPG16-45 | |
| 12 | 16 | | | | | |
| 12 | 16 | | | | | |
| 14 | 18 | 18.5 | | | | |
| 14 | 18 | | | | | |
| | 20 | 20.0 | | | | |
| 17 | 21 | 21.2 | FPAX21-BFM20-90 | FPAX21-BM20-45 | FPAX21-BPG13-45 | FPAX21-BFM20-45 |
| 17 | 21 | | | | FPAX21-BPG16-45 | |
| 17 | 21 | | | | | |
| | 25 | 25.0 | | | | |
| 23 | 28 | 28.5 | FPAX28-BFM25-90 | FPAX28-BM25-45 | FPAX28-BPG21-45 | FPAX28-BFM25-45 |
| 23 | 28 | | | | | |
| 29 | 34 | 34.5 | FPAX34-BFM32-90 | FPAX34-BM32-45 | FPAX34-BPG29-45 | FPAX34-BFM32-45 |
| 29 | 34 | | | | | |
| 36 | 42 | 42.5 | FPAX42-BFM50-90 | FPAX42-BM40-45 | FPAX42-BPG36-45 | FPAX42-BFM50-45 |
| 36 | 42 | | | FPAX42-BM50-45 | | |
| 48 | 54 | 54.5 | FPAX54-BFM50-90 | FPAX54-BM50-45 | FPAX54-BPG48-45* | FPAX54-BFM50-45 |
| 48 | 54 | | | FPAX54-BM63-45 | | |
| 56 | 67 | 67.0 | | | | |

## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass

- **Available on request:**
  - other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version, see page 55

## properties

- Fast fit
- IP rating: **for conduit & fitting IP66 + IP67 + IP68 (2 bar) + IP69**
  **for cable gland: IP68 (10 bar)+IP69**
- Supplied with additional conduit seal & face seal
- Face seal details:
  - **Metric Nylon threads supplied with retained Polyester Elastomer Washer**
  - **NPT and PG Nylon threads supplied with Neoprene Washer**
  - **Brass threads supplied with Fibre Washer**
  - **UNEF, Flange and Cable Glands supplied with O-ring**
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Can be removed using a screwdriver
- All round teeth give high pull off strength 70kg with FPAH21
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Suitable for fine and coarse pitch conduits
- Temperature range:
  **conduit fitting: -50˚C to +135˚C**
  **cable gland: -40˚C to +100˚C static**
  **-20˚C to +100˚C dynamic**
- Low Fire Hazard (LFH), see page 8
- Halogen, sulphur and phosphorus free
- Refer to accessories for clamping range page 85
- EN 45545 HL3 and NFPA compliant

### FPAX — NEW

**cable gland**

Fast fit, swivel, nickel plated brass external threaded cable gland fitting with additional conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



NPB Metric

### FPAX90 — NEW

**cable gland**

Fast fit, swivel, 90 degree elbow, nickel plated brass external threaded cable gland fitting with additional conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



NPB Metric

### FPAX45 — NEW

**cable gland**

Fast fit, swivel, 45 degree elbow, nickel plated brass external threaded cable gland fitting with additional conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



NPB Metric

| FPAX | FPAX90 | FPAX45 | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|
| | | | 10 | 10.0 | 7 |
| | | | 10 | | 7 |
| | | | 11 | 11.5 | 8 |
| FPAX13-BM16-CG | FPAX13-BM16-CG-90 | | 13 | 13.0 | 10 |
| | | | 13 | | 10 |
| | | | 13 | | 10 |
| FPAX16-BM16-CG | FPAX16-BM16-CG-90 | FPAX16-BM20-CG-45 | 16 | 15.8 | 12 |
| FPAX16-BM20-CG | FPAX16-BM20-CG-90 | | 16 | | 12 |
| | | | 16 | | 12 |
| | | | 16 | | 12 |
| | | | 18 | 18.5 | 14 |
| | | | 18 | | 14 |
| | | | 20 | 20.0 | |
| FPAX21-BM20-CG | FPAX21-BM20-CG-90 | FPAX21-BM20-CG-45 | 21 | 21.2 | 17 |
| | | | 21 | | 17 |
| | | | 21 | | 17 |
| | | | 25 | 25.0 | |
| FPAX28-BM25-CG | FPAX28-BM25-CG-90 | FPAX28-BM25-CG-45 | 28 | 28.5 | 23 |
| | | | 28 | | 23 |
| FPAX34-BM32-CG | FPAX34-BM32-CG-90 | FPAX34-BM32-CG-45 | 34 | 34.5 | 29 |
| | | | 34 | | 29 |
| FPAX42-BM40-CG | FPAX42-BM40-CG-90 | FPAX42-BM40-CG-45 | 42 | 42.5 | 36 |
| | | | 42 | | 36 |
| FPAX54-BM50-CG | FPAX54-BM50-CG-90 | FPAX54-BM50-CG-45 | 54 | 54.5 | 48 |
| | | | 54 | | 48 |
| | | | 67 | 67.0 | 56 |

Note: PG thread versions and EMC Cable Gland version on request.

## Standards & Approvals

BS EN IEC 61386

## Technical Drawing





# ULTRA™ system
## The World's Best Conduit Fitting

NEW

**Construction:** Nylon (PA66) moulded fittings featuring Integrated Sealing Technology

**Construction:** Nylon (PA66) moulded fittings featuring Integrated Sealing Technology with nickel plated brass swivel threads

**Colour:** 2 Tone Colour - Black and Grey.

Integrated Sealing Technology

EXTRA LOW FIRE HAZARD ★★

IP66 IP67 IP68 IP69

# Fittings ULTRA™ system straight

### FPAU — straight external thread

One piece fast fit, external threaded fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69

### FPAU — straight UNEF swivel internal thread

One piece fast fit fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors with integrated conduit seal.

IP66 IP67 IP68 IP69

### FPAU — straight swivel brass external thread

One piece fast fit, swivel, nickel plated brass external threaded fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69







| european (NW) sizes | nominal size (mm) | OD mm | Ext Metric | Ext NPT | Int UNEF | Thread | NPB Ext Metric | NPB Ext PG | NPB Ext NPT |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | | | | |
| 7 | 10 | | | | | | | | |
| 8 | 11 | 11.5 | | | | | | | |
| 10 | 13 | 13.0 | FPAU13-M16 | | | | FPAU13-BM16 | FPAU13-BPG9 | |
| 10 | 13 | | | | | | | | |
| 10 | 13 | | | | | | | | |
| 12 | 16 | 15.8 | FPAU16-M16 | FPAU16-038 | FPAU16-BU075 | (¾") | FPAU16-BM16 | FPAU16-BPG9 | FPAU16-B038* |
| 12 | 16 | | FPAU16-M20 | FPAU16-050 | FPAU16-BU088 | (⅞") | FPAU16-BM20 | FPAU16-BPG11 | FPAU16-B050* |
| 12 | 16 | | | | FPAU16-BU100 | (1") | | | |
| 12 | 16 | | | | FPAU16-BU119 | (1 3/16") | | | |
| 14 | 18 | 18.5 | | | | | | | |
| 14 | 18 | | | | | | | | |
| | 20 | 20.0 | | | | | | | |
| 17 | 21 | 21.2 | FPAU21-M20 | FPAU21-050 | FPAU21-BU100 | (1") | FPAU21-BM20 | FPAU21-BPG13 | FPAU21-B050* |
| 17 | 21 | | FPAU21-M25 | | FPAU21-BU119 | (1 3/16") | | FPAU21-BPG16 | |
| 17 | 21 | | | | FPAU21-BU125 | (1¼") | | | |
| | 25 | 25.0 | | | | | | | |
| 23 | 28 | 28.5 | FPAU28-M25 | FPAU28-075 | FPAU28-BU138 | (1⅜") | FPAU28-BM25 | FPAU28-BPG21 | FPAU28-B075* |
| 23 | 28 | | FPAU28-M32 | | | | | | |
| 29 | 34 | 34.5 | FPAU34-M32 | FPAU34-100 | FPAU34-BU144 | (1 7/16") | FPAU34-BM32 | FPAU34-BPG29 | FPAU34-B100* |
| 29 | 34 | | FPAU34-M40 | | | | | | |
| 36 | 42 | 42.5 | FPAU42-M40 | FPAU42-125 | FPAU42-BU200 | (2") | FPAU42-BM40 | FPAU42-BPG36 | FPAU42-B125* |
| 36 | 42 | | FPAU42-M50 | FPAU42-150 | FPAU42-BU225 | (2¼") | FPAU42-BM50 | | FPAU42-B150* |
| 48 | 54 | 54.5 | FPAU54-M50 | FPAU54-150 | FPAU54-BU200 | (2") | FPAU54-BM50 | | FPAU54-B150* |
| 48 | 54 | | FPAU54-M63 | FPAU54-200 | FPAU54-BU225 | (2¼") | FPAU54-BM63 | FPAU54-BPG48* | FPAU54-B200* |
| 56 | 67 | 67.0 | | | | | | | |

## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass
- **Available on request:**
  - other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version see page 55

## Fine Pitch



## Coarse Pitch



## properties

- Fast fit - True one piece component
- IP rating: for conduit & fitting **IP66 + IP67 + IP68 (2 bar) + IP68 (72hrs @ 1m) + IP69**
- PA66 Nylon moulded fitting
- Nylon threads supplied complete with glass reinforced nylon locknut
- Metallic threads made from Nickel Plated Brass
- Face seal details:
  - **Metric Nylon threads supplied with retained Polyester Elastomer Washer**
  - **Metric Brass threads supplied with retained Fibre Washer**
  - **NPT threads supplied with a Neoprene Washer**
  - **PG Brass threads supplied with Fibre Washer**
  - **UNEF, Flange and Cable Glands supplied with O-ring**
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Can be removed using a screwdriver
- All round teeth give high pull off strength
- 75kg with FPAH21
- Suitable for fine and coarse pitch conduits
- Temperature range: **conduit fitting: -50˚C to +135˚C**
- Low Fire Hazard (LFH) see page 8
- Halogen, sulphur and phosphorus free
- UV resistant
- Swivel threads allow assembly without twisting of cables
- EN 45545 HL3 and NFPA 130 compliant

NEW

### FPAU

Integrated Sealing Technology

**straight swivel brass internal thread**

One piece fast fit, swivel, nickel plated brass internal threaded fitting with integrated conduit seal or threaded entries.

IP66 IP67 IP68 IP69



NPB Int Metric

### FPAU

Integrated Sealing Technology

**flange**

One piece fast fit fitting with nylon swivel flange with integrated conduit seal and with 'O' ring face seal.

IP66 IP67 IP68 IP69



Flange

### FPAU - FPAU

Integrated Sealing Technology

**coupler**

One piece fast fit coupler to join corrugted conduits.

IP66 IP67 IP68 IP69

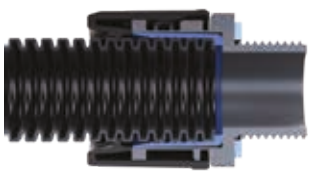


Coupler

| NPB Int Metric | Flange | Coupler | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|
| | | | 10 | 10.0 | 7 |
| | | | 10 | | 7 |
| | | | 11 | 11.5 | 8 |
| FPAU13-BFM16 | | | 13 | 13.0 | 10 |
| | | | 13 | | 10 |
| | | | 13 | | 10 |
| FPAU16-BFM16 | FPAU16-FL | FPAU16-FPAU16 | 16 | 15.8 | 12 |
| FPAU16-BFM20 | | | 16 | | 12 |
| | | | 16 | | 12 |
| | | | 16 | | 12 |
| | | | 18 | 18.5 | 14 |
| | | | 18 | | 14 |
| | | | 20 | 20.0 | |
| FPAU21-BFM20 | FPAU21-FL | FPAU21-FPAU21 | 21 | 21.2 | 17 |
| | | | 21 | | 17 |
| | | | 21 | | 17 |
| | | | 25 | 25.0 | |
| FPAU28-BFM25 | FPAU28-FL | FPAU28-FPAU28 | 28 | 28.5 | 23 |
| | | | 28 | | 23 |
| FPAU34-BFM32 | FPAU34-FL | FPAU34-FPAU34 | 34 | 34.5 | 29 |
| | | | 34 | | 29 |
| FPAU42-BFM40 | FPAU42-FL | | 42 | 42.5 | 36 |
| | | | 42 | | 36 |
| FPAU54-BFM50 | | | 54 | 54.5 | 48 |
| | | | 54 | | 48 |
| | | | 67 | 67.0 | 56 |

## Standards & Approvals

## Technical Drawing



Integrated Sealing Technology

FLEXICON Ultra



# ULTRA™ system
## The World's Best Conduit Fitting

NEW

**Construction:** Nylon (PA66) moulded fittings featuring Integrated Sealing Technology

**Construction:** Nylon (PA66) moulded fittings featuring Integrated Sealing Technology with nickel plated brass swivel threads

**Colour:** 2 Tone Colour - Black and Grey.

Integrated Sealing Technology

EXTRA LOW FIRE HAZARD ★★

IP66 IP67 IP68 IP69

# Fittings ULTRA™ system 90° and 45°

## FPAU 90 — 90° external thread

Integrated Sealing Technology

One piece fast fit, external threaded 90 degree elbow fitting with integrated conduit for knockouts.

IP66 IP67 IP68 IP69



## FPAU 90 — 90° UNEF swivel internal thread

Integrated Sealing Technology

One piece fast fit, 90 degree elbow fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors with integrated conduit seal.

IP66 IP67 IP68 IP69



## FPAU 90 — 90° swivel brass external thread

Integrated Sealing Technology

One piece fast fit, swivel, 90 degree elbow, nickel plated brass external threaded fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



## FPAU 90 — 90° swivel brass internal thread

Integrated Sealing Technology

One piece fast fit, swivel, 90 degree elbow, nickel plated brass internal threaded fitting with integrated conduit seal.

IP66 IP67 IP68 IP69



| european (NW) sizes | nominal size (mm) | OD mm | Ext Metric | Ext NPT | Int UNEF | | NPB Ext Metric | NPB Ext PG | NPB Ext NPT | NPB Int Metric |
|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | | | | | |
| 7 | 10 | | | | | | | | | |
| 8 | 11 | 11.5 | | | | | | | | |
| 10 | 13 | 13.0 | FPAU13-M16-90 | | | | FPAU13-BM16-90 | FPAU13-BPG9-90 | | FPAU13-BFM16-90 |
| 10 | 13 | | | | | | | | | |
| 10 | 13 | | | | | | | | | |
| 12 | 16 | 15.8 | FPAU16-M16-90 | FPAU16-050-90B | FPAU16-BU075-90 | (¾") | FPAU16-BM16-90 | FPAU16-BPG9-90 | FPAU16-B050-90* | FPAU16-BFM16-90 |
| 12 | 16 | | FPAU16-M20-90 | | FPAU16-BU088-90 | (⅞") | FPAU16-BM20-90 | FPAU16-BPG11-90 | | FPAU16-BFM20-90 |
| 12 | 16 | | | | FPAU16-BU100-90 | (1") | | | | |
| 12 | 16 | | | | FPAU16-BU119-90 | (1 3/16") | | | | |
| 14 | 18 | 18.5 | | | | | | | | |
| 14 | 18 | | | | | | | | | |
| | 20 | 20.0 | | | | | | | | |
| 17 | 21 | 21.2 | FPAU21-M20-90 | FPAU21-050-90B | FPAU21-BU100-90 | (1") | FPAU21-BM20-90 | FPAU21-BPG13-90 | FPAU21-B050-90* | FPAU21-BFM20-90 |
| 17 | 21 | | | | FPAU21-BU119-90 | (1 3/16") | | FPAU21-BPG16-90 | | |
| 17 | 21 | | | | FPAU21-BU125-90 | (1¼") | | | | |
| | 25 | 25.0 | | | | | | | | |
| 23 | 28 | 28.5 | FPAU28-M25-90 | FPAU28-075-90B | FPAU28-BU133-90 | (1⅜") | FPAU28-BM25-90 | FPAU28-BPG21-90 | FPAU28-B075-90* | FPAU28-BFM25-90 |
| 23 | 28 | | | | FPAU28-BU144-90 | (1 7/16") | | | | |
| 29 | 34 | 34.5 | FPAU34-M32-90 | FPAU34-100-90B | FPAU34-BU144-90 | (1 7/16") | FPAU34-BM32-90 | FPAU34-BPG29-90 | FPAU34-B100-90* | FPAU34-BFM32-90 |
| 29 | 34 | | | | FPAU34-BU175-90 | (1¾") | | | | |
| 36 | 42 | 42.5 | FPAU42-M40-90 | FPAU42-125-90B | FPAU42-BU200-90 | (2") | FPAU42-BM40-90 | FPAU42-BPG36-90 | FPAU42-B125-90* | FPAU42-BFM50-90 |
| 36 | 42 | | FPAU42-M50-90 | FPAU42-150-90B | FPAU42-BU225-90 | (2¼") | FPAU42-BM50-90 | | FPAU42-B150-90* | |
| 48 | 54 | 54.5 | FPAU54-M50-90 | FPAU54-150-90B | FPAU54-BU200-90 | (2") | FPAU54-BM50-90 | FPAU54-BPG48-90* | FPAU54-B150-90* | FPAU54-BFM50-90 |
| 48 | 54 | | FPAU54-M63-90 | FPAU54-200-90B | FPAU54-BU225-90 | (2¼") | FPAU54-BM63-90 | | FPAU54-B200-90* | |
| 56 | 67 | 67.0 | | | | | | | | |

## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass
- **Available on request:**
  - other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version see page 55

## How to identify a Flexicon ULTRA™ fitting



- 2 Tone colour - Capnut different to Body
- IP69 and Ultra logo marked on product
- Blue insert seal with visible ribs within capnut
- Retained Face Sealing Washer

## properties

- Fast fit - True one piece component
- IP rating: for conduit & fitting **IP66 + IP67 + IP68 (2 bar) + IP68 (72hrs @ 1m) + IP69**
- PA66 Nylon moulded fitting
- Metallic threads made from Nickel Plated Brass
- Nylon threads supplied complete with glass reinforced nylon locknut
- Face seal details:
  - **Metric Nylon threads supplied with retained Polyester Elastomer Washer**
  - **Metric Brass threads supplied with retained Fibre Washer**
  - **NPT threads supplied with a Neoprene Washer**
  - **PG Brass threads supplied with Fibre Washer**
  - **UNEF, Flange and Cable Glands supplied with O-ring**
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Can be removed using a screwdriver
- All round teeth give high pull off strength
- 75kg with FPAH21
- Suitable for fine and coarse pitch conduits
- Temperature range: **conduit fitting: -50˚C to +135˚C**
- Low Fire Hazard (LFH) see page 8
- Halogen, sulphur and phosphorus free
- UV resistant
- Swivel threads allow assembly without twisting of cables
- EN 45545 HL3 and NFPA130 compliant

NEW

### FPAU 90

Integrated Sealing Technology

**90˚ flange**

One piece fast fit 90 degree elbow fitting with nylon swivel flange with integrated conduit seal and 'O' ring face seal.

IP66 IP67 IP68 IP69



Flange

### FPAU 45

Integrated Sealing Technology

**45˚ flange**

One piece fast fit, 45 degree elbow fitting with nylon swivel flange with integrated conduit seal and with 'O' ring face seal.

IP66 IP67 IP68 IP69



Flange

### FPAU 45

Integrated Sealing Technology

**45˚ UNEF swivel internal thread**

One piece fast fit, 45 degree elbow fitting with nickel plated brass swivel UNEF internal thread for attachment to circular connectors with integrated conduit seal.

IP66 IP67 IP68 IP69



Int UNEF

| | | | | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|---|
| | | | | 10 | 10.0 | 7 |
| | | | | 10 | | 7 |
| | | | | 11 | 11.5 | 8 |
| | | | | 13 | 13.0 | 10 |
| | | | | 13 | | 10 |
| | | | | 13 | | 10 |
| FPAU16-FL-90 | FPAU16-FL-45 | FPAU16-BU075-45 | (¾") | 16 | 15.8 | 12 |
| | | FPAU16-BU088-45 | (⅞") | 16 | | 12 |
| | | FPAU16-BU100-45 | (1") | 16 | | 12 |
| | | FPAU16-BU119-45 | (1 3/16") | 16 | | 12 |
| | | | | 18 | 18.5 | 14 |
| | | | | 18 | | 14 |
| | | | | 20 | 20.0 | |
| FPAU21-FL-90 | FPAU21-FL-45 | FPAU21-BU100-45 | (1") | 21 | 21.2 | 17 |
| | | FPAU21-BU119-45 | (1 3/16") | 21 | | 17 |
| | | FPAU21-BU125-45 | (1¼") | 21 | | 17 |
| | | | | 25 | 25.0 | |
| FPAU28-FL-90 | FPAU28-FL-45 | FPAU28-BU133-45 | (1⅜") | 28 | 28.5 | 23 |
| | | FPAU28-BU144-45 | (1 7/16") | 28 | | 23 |
| FPAU34-FL-90 | FPAU34-FL-45 | FPAU34-BU144-45 | (1 7/16") | 34 | 34.5 | 29 |
| | | FPAU34-BU175-45 | (1¾") | 34 | | 29 |
| FPAU42-FL-90 | FPAU42-FL-45 | FPAU42-BU200-45 | (2") | 42 | 42.5 | 36 |
| | | FPAU42-BU225-45 | (2¼") | 42 | | 36 |
| FPAU54-FL-90 | FPAU54-FL-45 | FPAU54-BU200-45 | (2") | 54 | 54.5 | 48 |
| | | FPAU54-BU225-45 | (2¼") | 54 | | 48 |
| | | | | 67 | 67.0 | 56 |

## Standards & Approvals

ISO/TS 22163:2017

## Benefits of Barb Construction

- Inherent swivel feature allowing easy connection to another thread for termination, eliminating any dynamic stress on the system
- Reduces wear between the retaining teeth and the conduit, which can often lead to failure



# ULTRA™ system
## The World's Best Conduit Fitting

NEW

**Construction:** Nylon (PA66) moulded fittings featuring Integrated Sealing Technology

**Construction:** Nylon (PA66) moulded fittings featuring Integrated Sealing Technology with nickel plated brass swivel threads

**Colour:** 2 Tone Colour - Black and Grey.

Integrated Sealing Technology

EXTRA LOW FIRE HAZARD ★★

IP66 IP67 IP68 IP69

# Fittings ULTRA™ system 45°

## FPAU 45

Integrated Sealing Technology

**45° external thread**

One piece fast fit, external threaded 45 degree elbow fitting with integrated conduit seal. Suitable for knockouts.

IP66 IP67 IP68 IP69



## FPAU 45

Integrated Sealing Technology

**45° swivel brass external thread**

One piece fast fit, swivel, 45 degree elbow, nickel plated brass external threaded fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



## FPAU 45

Integrated Sealing Technology

**45° swivel brass internal thread**

One piece fast fit, swivel, 45 degree elbow fitting, nickel plated brass internal threaded fitting with integrated conduit seal.

IP66 IP67 IP68 IP69



| european (NW) sizes | nominal size (mm) | OD mm | Ext Metric | Ext NPT | NPB Ext Metric | NPB Ext PG | NPB Ext NPT | NPB Int Metric |
|---|---|---|---|---|---|---|---|---|
| 7 | 10 | 10.0 | | | | | | |
| 7 | 10 | | | | | | | |
| 8 | 11 | 11.5 | | | | | | |
| 10 | 13 | 13.0 | | | | | | |
| 10 | 13 | | | | | | | |
| 10 | 13 | | | | | | | |
| 12 | 16 | 15.8 | FPAU16-M20-45 | FPAU16-050-45 | FPAU16-BM16-45 | FPAU16-BPG13-45 | FPAU16-B050-45* | FPAU16-BFM20-45 |
| 12 | 16 | | | | FPAU16-BM20-45 | FPAU16-BPG16-45 | | |
| 12 | 16 | | | | | | | |
| 12 | 16 | | | | | | | |
| 14 | 18 | 18.5 | | | | | | |
| 14 | 18 | | | | | | | |
| | 20 | 20.0 | | | | | | |
| 17 | 21 | 21.2 | FPAU21-M20-45 | FPAU21-050-45 | FPAU21-BM20-45 | FPAU21-BPG13-45 | FPAU21-B050-45* | FPAU21-BFM20-45 |
| 17 | 21 | | | | | FPAU21-BPG16-45 | | |
| 17 | 21 | | | | | | | |
| | 25 | 25.0 | | | | | | |
| 23 | 28 | 28.5 | FPAU28-M25-45 | FPAU28-075-45 | FPAU28-BM25-45 | FPAU28-BPG21-45 | FPAU28-B075-45* | FPAU28-BFM25-45 |
| 23 | 28 | | | | | | | |
| 29 | 34 | 34.5 | FPAU34-M32-45 | FPAU34-100-45 | FPAU34-BM32-45 | FPAU34-BPG29-45 | FPAU34-B100-45* | FPAU34-BFM32-45 |
| 29 | 34 | | | | | | | |
| 36 | 42 | 42.5 | FPAU42-M50-45 | FPAU42-150-45 | FPAU42-BM40-45 | FPAU42-BPG36-45 | FPAU42-B125-45* | FPAU42-BFM50-45 |
| 36 | 42 | | | | FPAU42-BM50-45 | | FPAU42-B150-45* | |
| 48 | 54 | 54.5 | FPAU54-M50-45 | FPAU54-150-45 | FPAU54-BM50-45 | FPAU54-BPG48-45* | FPAU54-B150-45* | FPAU54-BFM50-45 |
| 48 | 54 | | | | FPAU54-BM63-45 | | FPAU54-B200-45* | |
| 56 | 67 | 67.0 | | | | | | |

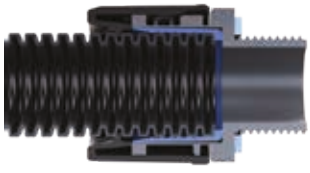
## Ordering Notes

* Indicates parts made to order on request

- NPB = Nickel Plated Brass

- **Available on request:**
  - other threads
  - for brass locknuts and sealing washers see accessories, page 84
  - EMC braid clamp version see page 55

## Technical Drawing



## properties

- Fast fit - True one piece component
- IP rating: **for conduit & fitting - IP66 + IP67 + IP68 (2 bar) + IP68 (72hrs @ 1m) + IP69 for cable gland - IP68 (10 bar)**
- Nylon threads supplied complete with glass reinforced nylon locknut
- PA66 Nylon moulded fitting
- Metallic threads made from Nickel Plated Brass
- Face seal details:
  - **Metric Nylon threads supplied with retained Polyester Elastomer Washer**
  - **Metric Brass threads supplied with retained Fibre Washer**
  - **NPT threads supplied with a Neoprene Washer**
  - **PG Brass threads supplied with Fibre Washer**
  - **UNEF, Flange and Cable Glands supplied with O-ring**
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Both 90˚ and 45˚ elbows incorporate swept bore to facilitate cable installation and protect cables when installed
- Can be removed using a screwdriver
- All round teeth give high pull off strength 75kg with FPAH21
- Suitable for fine and coarse pitch conduits
- Temperature range: conduit fitting: -50˚C to +135˚C
- Low Fire Hazard (LFH) see page 8
- Halogen, sulphur and phosphorus free
- UV resistant
- Swivel threads allow assembly without twisting of cables
- EN 45545 HL3 and NFPA130 compliant
- Refer to tables below for clamping range (Cable Range)

NEW

# ULTRA™ system R Type Cable Strain Relief

## STRAIGHT

Integrated Sealing Technology

**cable gland**

One piece fast fit, swivel, nickel plated brass external threaded cable gland fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



## 90˚ELBOW

Integrated Sealing Technology

**cable gland**

One piece fast fit, swivel, 90 degree elbow, nickel plated brass external threaded cable gland fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



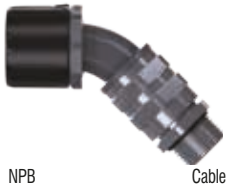
## 45˚ELBOW

Integrated Sealing Technology

**cable gland**

One piece fast fit, swivel, 45 degree elbow, nickel plated brass external threaded cable gland fitting with integrated conduit seal. Suitable for knockouts or threaded entries.

IP66 IP67 IP68 IP69



| STRAIGHT NPB metric | STRAIGHT Cable Range (mm) | STRAIGHT NPB metric | STRAIGHT Cable Range (mm) | 90˚ELBOW NPB metric | 90˚ELBOW Cable Range (mm) | 45˚ELBOW NPB metric | 45˚ELBOW Cable Range (mm) | nominal size (mm) | OD mm | european (NW) sizes |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 10 | 10.0 | 7 |
| | | | | | | | | 10 | | 7 |
| | | | | | | | | 11 | 11.5 | 8 |
| FPAU13-BM16-CG-R1 | 4.0 - 6.5 | | | FPAU13-BM16-CG-R1-90 | 4.0 - 6.5 | | | 13 | 13.0 | 10 |
| FPAU13-BM16-CG-R2 | 5.0 - 8.0 | | | FPAU13-BM16-CG-R2-90 | 5.0 - 8.0 | | | 13 | | 10 |
| FPAU13-BM16-CG-R3 | 6.5 - 9.5 | | | FPAU13-BM16-CG-R3-90 | 6.5 - 9.5 | | | 13 | | 10 |
| FPAU16-BM16-CG-R1 | 4.0 - 6.5 | FPAU16-BM20-CG-R1 | 4.0 - 6.5 | FPAU16-BM16-CG-R1-90 | 4.0 - 6.5 | FPAU16-BM20-CG-R1-45 | 4.0 - 6.5 | 16 | 15.8 | 12 |
| FPAU16-BM16-CG-R2 | 5.0 - 8.0 | FPAU16-BM20-CG-R2 | 5.0 - 8.0 | FPAU16-BM16-CG-R2-90 | 5.0 - 8.0 | FPAU16-BM20-CG-R2-45 | 5.0 - 8.0 | 16 | | 12 |
| FPAU16-BM16-CG-R3 | 6.5 - 9.5 | FPAU16-BM20-CG-R3 | 6.5 - 9.5 | FPAU16-BM16-CG-R3-90 | 6.5 - 9.5 | FPAU16-BM20-CG-R3-45 | 6.5 - 9.5 | 16 | | 12 |
| | | FPAU16-BM20-CG-R4 | 7.0 - 10.5 | | | FPAU16-BM20-CG-R4-45 | 7.0 - 10.5 | 16 | | 12 |
| | | | | | | | | 18 | 18.5 | 14 |
| | | | | | | | | 18 | | 14 |
| | | | | | | | | 20 | 20.0 | |
| FPAU21-BM20-CG-R1 | 4.0 - 6.5 | FPAU21-BM20-CG-R4 | 7.0 - 10.5 | FPAU21-BM20-CG-R1-90 | 4.0 - 6.5 | FPAU21-BM20-CG-R1-45 | 4.0 - 6.5 | 21 | 21.2 | 17 |
| FPAU21-BM20-CG-R2 | 5.0 - 8.0 | FPAU21-BM25-CG-R1 | 9.0 - 13.0 | FPAU21-BM20-CG-R2-90 | 5.0 - 8.0 | FPAU21-BM20-CG-R2-45 | 5.0 - 8.0 | 21 | | 17 |
| FPAU21-BM20-CG-R3 | 6.5 - 9.5 | FPAU21-BM25-CG-R2 | 11.0 - 15.5 | FPAU21-BM20-CG-R3-90 | 6.5 - 9.5 | FPAU21-BM20-CG-R3-45 | 6.5 - 9.5 | 21 | | 17 |
| | | | | | | | | 25 | 25.0 | |
| FPAU28-BM25-CG-R1 | 9.0 - 13.0 | FPAU28-BM32-CG-R1 | 14.0 - 18.0 | FPAU28-BM25-CG-R1-90 | 9.0 - 13.0 | FPAU28-BM25-CG-R1-45 | 9.0 - 13.0 | 28 | 28.5 | 23 |
| FPAU28-BM25-CG-R2 | 11.0 - 15.5 | FPAU28-BM32-CG-R2 | 17.0 - 20.5 | FPAU28-BM25-CG-R2-90 | 11.0 - 15.5 | FPAU28-BM25-CG-R2-45 | 11.0 - 15.5 | 28 | | 23 |
| FPAU34-BM32-CG-R1 | 14.0 - 18.0 | | | FPAU34-BM32-CG-R1-90 | 14.0 - 18.0 | FPAU34-BM32-CG-R1-45 | 14.0 - 18.0 | 34 | 34.5 | 29 |
| FPAU34-BM32-CG-R2 | 17.0 - 20.5 | | | FPAU34-BM32-CG-R2-90 | 17.0 - 20.5 | FPAU34-BM32-CG-R2-45 | 17.0 - 20.5 | 34 | | 29 |
| FPAU42-BM40-CG-R1 | 17.0 - 20.5 | FPAU42-BM50-CG-R1 | 27.0 - 32.0 | FPAU42-BM40-CG-R1-90 | 17.0 - 20.5 | FPAU42-BM40-CG-R1-45 | 17.0 - 20.5 | 42 | 42.5 | 36 |
| FPAU42-BM40-CG-R2 | 20.0 - 25.0 | FPAU42-BM50-CG-R2 | 29.0 - 34.0 | FPAU42-BM40-CG-R2-90 | 20.0 - 25.0 | FPAU42-BM40-CG-R2-45 | 20.0 - 25.0 | 42 | | 36 |
| FPAU54-BM50-CG-R1 | 32.0 - 36.0 | FPAU54-BM63-CG-R1 | 36.0 - 40.0 | FPAU54-BM50-CG-R1-90 | 32.0 - 36.0 | FPAU54-BM50-CG-R1-45 | 32.0 - 36.0 | 54 | 54.5 | 48 |
| FPAU54-BM50-CG-R2 | 36.0 - 40.0 | FPAU54-BM63-CG-R2 | 39.0 - 44.0 | FPAU54-BM50-CG-R2-90 | 36.0 - 40.0 | FPAU54-BM50-CG-R2-45 | 36.0 - 40.0 | 54 | | 48 |
| | | | | | | | | 67 | 67.0 | 56 |

## Standards & Approvals

ISO/TS 22163:2017

## How to identify a Flexicon ULTRA™ fitting



- 2 Tone colour - Capnut different to Body
- IP69 and Ultra logo marked on product
- Blue insert seal with visible ribs within capnut
- Retained Face Sealing Washer



# Abrasion Rings FPA & FPAX, T Pieces and Dividers

**Construction:** Nylon (PA66) moulded fitting.
FPA colour black or grey as standard. FPAX incorporate internal elastomeric seal(s).

EXTRA LOW FIRE HAZARD ★★ IP66 IP67 IP68 IP69

## Fittings

| ARB (NEW) | FPA | FPA | Reducer/Stop Plug |
|---|---|---|---|
| **Nylon abrasion ring**<br>For Corrugated Conduit | **T piece with inspection lid**<br>Fast fit T piece with inspection lid.<br>IP66 | **Reducing divider**<br>Fast fit reducing divider<br>IP66 | Fitting to reduce or blank off any outlets.<br>IP66 |










| european (NW) sizes | Conduit In (mm) | Conduit Out x 2 for divider | ARB (NEW) | FPA | FPA | Reducer/Stop Plug |
|---|---|---|---|---|---|---|
| 12 | 16 | 13 | | FPA16T<br>FPA20T | FPA16-13-13 | FPA13-R16<br>SP-R16 |
| 17 | 21 | 16 | | FPA21T | FPA21-16-16 | FPA16-R21<br>FPA13-R21<br>SP-R21 |
| 23 | 28 | 21 | | FPA28T | FPA28-21-21 | FPA25-R28<br>FPA21-R28<br>FPA20-R28<br>FPA16-R28<br>FPA13-R28<br>SP-R28 |
| 29 | 34 | 28 | | FPA34T | FPA34-28-28 | FPA28-R34<br>FPA21-R34<br>FPA16-R34<br>SP-R34 |
| 36 | 42 | | AR42B | FPA42T | | FPA34-R42<br>FPA28-R42<br>FPA21-R42 |
| 48 | 54 | | AR54B | | | |

## Ordering Notes

* Indicates parts made to order on request and may be subject to MOQ and lead time

- **Available on request:**
  - other colours

## How to read the fittings code

FPAX21-R28

Conduit Size
T-piece or Reducer Size



## properties

- Fast fit
- **IP rating: FPA: IP66**
  **FPAX: IP66 + IP67 + IP68 (2 bar)**
  **FPAX Divider: IP66 + IP67 + IP68 (2 bar) +IP69**
- Maintains all the benefits of FPA and FPAX fittings
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- All round teeth give high pull off strength
- Low Fire Hazard (LFH), see page 8
- Halogen, sulphur & phosphorous free
- **Inspection lid facilitates pull through of cables easing installation on the T-piece**
- Rounded internal corners protect cable insulation during installation and use
- Incorporates mounting lugs to aid secure fixing
- EN 45545 HL3 and NFPA130 compliant



### FPAX

**T piece with inspection lid**

Fast fit T piece with inspection lid and additional seals for enhanced IP rating.

IP66 IP67 IP68



### FPAX NEW

**Divider**

Fast fit reducing divider with additional seals for enhanced IP ratings

IP66 IP67 IP68 IP69



### Reducer / Stop Plug

Fitting to reduce or blank off any outlets.

IP66 IP67 IP68





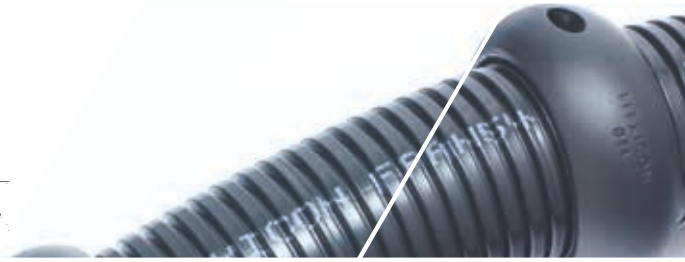


| european (NW) sizes | Conduit In (mm) | Conduit Out x 2 for divider | | | |
|---|---|---|---|---|---|
| 12 | 16 | 13 | FPAX16T<br>FPAX20T | FPAX16-13-13 | FPAX13-R16<br>SP-R16 |
| 17 | 21 | 16 | FPAX21T | FPAX21-16-16 | FPAX16-R21<br>FPAX13-R21<br>SP-R21 |
| 23 | 28 | 21 | FPAX28T | FPAX28-21-21 | FPAX21-R28<br>FPAX16-R28<br>FPAX13-R28<br>SP-R28 |
| 29 | 34 | 28 | FPAX34T | FPAX34-28-28 | FPAX28-R34<br>FPAX21-R34<br>FPAX16-R34<br>SP-R34 |
| 36 | 42 | | FPAX42T | FPAX42-34-34 | FPAX34-R42<br>FPAX28-R42<br>FPAX21-R42 |
| 48 | 54 | 42 | | FPAX54-42-42 | FPAX34-R42 |



## Standards & Approvals

BS EN IEC 61386





# FPRSS system
corrugated nylon, (PA6)
stainless steel overbraid

# FPRTC system
corrugated nylon, (PA6)
tinned copper overbraid

## Conduit

### FPRSS

**Construction:** Standard weight, extra low fire hazard, corrugated nylon (PA6), with stainless steel (316L) overbraid.

**Typical Applications:** Metro rail stations for anti-vandal.

EN 45545-2 HL3 NFPA 130

### FPRTC

**Construction:** Standard weight, extra low fire hazard, corrugated nylon (PA6), with tinned copper overbraid.

**Typical Applications:** Inside railway carriages where screening is required.

EN 45545-2 HL3 NFPA 130

### FPISS

**Construction:** Standard weight, corrugated nylon (PA12), with stainless steel (316L) overbraid.

**Typical Applications:** Moving machinery where low temperatures, abrasion and impacts occur.

### FPIHSS

**Construction:** Heavy weight, corrugated nylon (PA12), with stainless steel (316L) overbraid.

**Typical Applications:** Under railway carriages where low temperatures, abrasion, impact and regular movement occurs.

### FPIHRSS

NEW

**Construction:** Heavy weight, extra low fire hazard, corrugated nylon (PA12), with stainless steel (316L) overbraid.

**Typical Applications:** Under railway carriages where extra low fire hazard, low temperatures, abrasion, impact and regular movement occurs.

EN 45545-2 HL3 NFPA 130

## Fittings

### C

**fixed external thread nickel plated brass**

Multipart compression fitting including conduit retention clip and elastomeric seal. Can be used with knockouts. Braid is locked between inner and outer compression nuts.

IP67

### C-S

**swivel external thread nickel plated brass**

Multipart compression fitting including conduit retention clip and elastomeric seal. Can be used for knockouts and threaded entries. Braid is locked between inner and outer compression nuts.

IP67



| nominal size (mm) | FPRSS part number | FPRTC part number | FPISS part number | FPIHSS part number | FPIHRSS part number | outside dia (mm) | min inside dia (mm) | min inside bend radius (mm) | metric thread part number | metric thread part number | PG thread part number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | FPRSS16-50M | FPRTC16-50M* | FPISS16-50M* | FPIHSS16-50M* | FPIHRSS16-50M* | 17.3 | 11.5 | 35 | BC16-M16-C | BC16-M16-S | BC16-PG11-S |
| 21 | FPRSS21-50M | FPRTC21-50M* | FPISS21-50M* | FPIHSS21-50M* | FPIHRSS21-50M* | 22.7 | 15.0 | 45 | BC21-M20-C | BC21-M20-S | BC21-PG16-S |
| 28 | FPRSS28-50M | FPRTC28-50M* | FPISS28-50M* | FPIHSS28-50M* | FPIHRSS28-50M* | 30.0 | 21.3 | 50 | BC28-M25-C | BC28-M25-S | BC28-PG21-S |
| 34 | FPRSS34-50M | FPRTC34-50M* | FPISS34-25M* | FPIHSS34-25M* | FPIHRSS34-25M* | 36.0 | 27.6 | 60 | BC34-M32-C | BC34-M32-S | BC34-PG29-S |
| 42 | FPRSS42-25M* | FPRTC42-25M* | FPISS42-25M* | FPIHSS42-25M* | FPIHRSS42-25M* | 44.0 | 35.5 | 70 | BC42-M40-C | BC42-M40-S | |
| 54 | FPRSS54-25M* | FPRTC54-25M* | FPISS54-25M* | FPIHSS54-25M* | FPIHRSS54-25M* | 56.0 | 47.2 | 80 | BC54-M50-C* | BC54-M50-S* | |

## Ordering Notes

* Indicates parts made to order on request and may be subject to MOQ and lead time

- **Available on request:**
  - longer lengths
  - cut lengths and assemblies
  - additional sizes
  - full copies of independent test report confirming screening effectiveness

## How to read the fittings code

BC21-M20-C

- BC21 — conduit
- M20 — thread size
- C — fitting type

## Standards & Approvals

UNDERGROUND · CE · RoHS · REACh · BS EN IEC 61386 · EN 45545-2 HL3 · NFPA 130 · IRIS Certification ISO/TS 22163:2017

Note: refer to conduit properties for applicable standards

# FPISS, FPIHSS system corrugated nylon, (PA12), stainless steel overbraid

# FPIHRSS system corrugated nylon, (PA12), stainless steel overbraid

properties

**FPRSS & FPRTC**

- Highly flexible and high fatigue life
- High impact strength
- Temperature range -40˚C to +120˚C
- Extra low fire hazard see page 8
- Provides EMC screening
  **49dB@1MHz (FPRSS)**
  **67dB@1MHz (FPRTC)**
- **FPRSS provides high tensile strength and resistance to abrasion, corrosion and vandals**
- Vibration and shock tested to EN61373 Cat 2
- **LUL Std S1085 Cert No. 298**

**FPISS, FPIHRSS & FPIHSS**

- Highly flexible
- Exceptional fatigue life
- Very high impact resistance even at low temperatures
- Temperature range -50˚C to +110˚C
- Low fire hazard
- Provides EMC screening 49dB@1MHz
- Provides high tensile strength and resistance to abrasion, corrosion and vandals
- Vibration and shock tested to EN61373 Cat 2
- **FPIHRSS EN 45545-2 to HL3 and NFPA130**

## C-90

**external thread elbow nickel plated brass**

Multipart 90˚ compression fitting including conduit retention clip and elastomeric seal. Can be used with knockouts. Braid is locked between inner and outer compression nuts.

IP67

## 90° elbow

**internal and external threaded nickel plated brass elbow**

90˚ elbow which can be screwed onto external threaded fittings.

## FW

**fibre retained face sealing washers**

Retained sealing washer to maintain IP rating of fitting to adjacent equipment.

## sealing washers

**fibre face sealing washers**

Sealing washer to maintain IP rating of fitting to adjacent equipment.

## locknuts

**galvanised steel and nickel plated brass locknuts**

Hexagonal locknut to secure fitting. EMC locknuts have raised corners to ensure good continuity.

## FCC

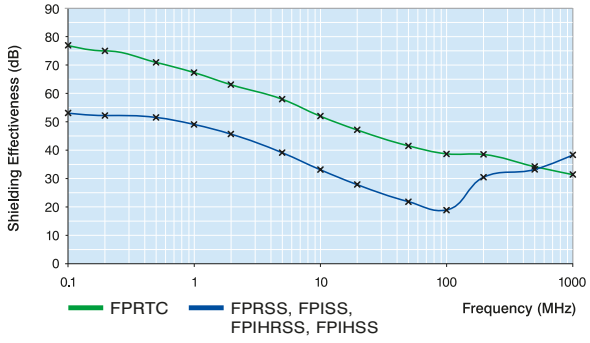
**plated steel P clip with pvc liner, stainless steel P clips**

P clip to support conduit.

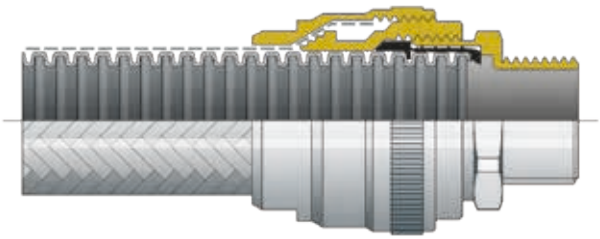


| | metric thread part number | metric thread part number | metric thread part number | part number | metric thread steel part number | metric thread EMC part number | metric thread brass part number | plated steel part number | stainless steel part number | nominal size (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | BM90-16M | FW16 | FWPG11 | S-M16 | | B-M16 | FCC16 | FCC16-SS | 16 |
| | BC21-M20-C90 | BM90-20M | FW20 | FWPG16 | S-M20 | B-M20-EMC | B-M20 | FCC20 | FCC20-SS | 20 |
| | | BM90-25M | FW25 | FWPG21 | S-M25 | B-M25-EMC | B-M25 | FCC25 | FCC25-SS | 25 |
| | | BM90-32M | FW32 | FWPG29 | S-M32 | B-M32-EMC | B-M32 | FCC32 | FCC32-SS | 32 |
| | | BM90-40M | FW40 | | S-M40 | B-M40-EMC | B-M40 | FCC40 | FCC40-SS | 40 |
| | | BM90-50M | FW50 | | S-M50 | | B-M50 | FCC50 | FCC50-SS | 50 |

## EMC Screening Performance




## Technical Drawing





# FTCB Braided sleeving
## tinned copper braid system for EMC screening

## Braid

### FTCB

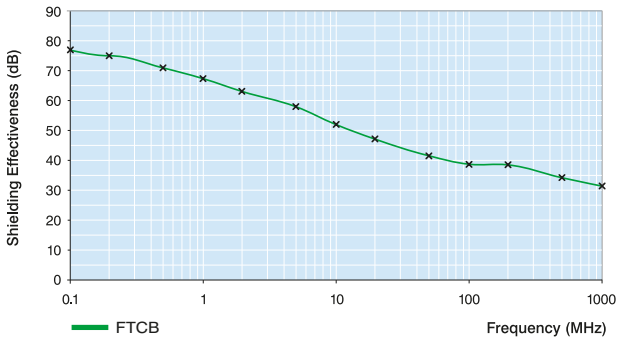
**Construction:** Tinned copper braided sleeving.

**Colour:** Self colour

**Typical Applications:** Screening of cables from electromagnetic, electrostatic and RF interference. Can be sleeved over cables before they are drawn into conduits.

- EMC Screening 67dB @ 1Mhz for 20mm
- Minimum optical cover 90%
- Can offer mechanical support
- Can offer abrasion resistance

## EMC Screening Performance




| FTCB part number | Reel length (m) | Nominal I/D(mm) | Usable ø mm min | Usable ø mm max | Cross sectional area -mm² |
|---|---|---|---|---|---|
| FTCB3 | 100 | 3.0 | 2.0 | 3.5 | 1.06 |
| FTCB4 | 100 | 4.0 | 3.0 | 5.0 | 1.49 |
| FTCB5 | 100 | 5.0 | 4.0 | 6.0 | 1.91 |
| FTCB6 | 100 | 6.0 | 5.0 | 7.0 | 2.23 |
| FTCB10 | 50 | 10.0 | 7.0 | 12.0 | 4.43 |
| FTCB12 | 50 | 12.5 | 11.0 | 13.0 | 4.83 |
| FTCB15 | 50 | 15.0 | 13.0 | 18.0 | 8.29 |
| FTCB20 | 50 | 20.0 | 17.0 | 23.0 | 9.65 |
| FTCB25 | 50 | 25.0 | 22.0 | 28.0 | 12.54 |
| FTCB30 | 25 | 30.0 | 27.0 | 36.0 | 19.30 |
| FTCB35 | 25 | 35.0 | 30.0 | 50.0 | 19.30 |
| FTCB50 | 25 | 50.0 | 45.0 | 65.0 | 35.63 |

## Note

- As the diameter increases towards the maximum expansion the sleeving decreases in length
- Normally supplied on disposable PVC former or can be supplied in flat form on a reel by request
- Temperature performance of sleeving: -50°C to +300°C

## Ordering Notes

- As the diameter increases towards the maximum expansion the sleeving decreases in length.
- Normally supplied on disposable PVC former or can be supplied in flat form on a reel by request
- Temperature performance of sleeving: -50°C to +300°C

## Standards

BS EN IEC 61386

CE

RoHS

REACh

# SBCA System
swivel braid clamp adaptor



## Fittings

### FPA

**Construction:** Nylon PA66 & Nickel Plated Brass.

**Colour:** Black.

**Typical Applications:** Straight fitting with internal braid clamp assembly for use with braided sleeving inside corrugated conduit.

IP66

### FPAX

IP66 IP67 IP68 IP69

### FPAU NEW

IP66 IP67 IP68 IP69

### FTCB

See page 54 for details.

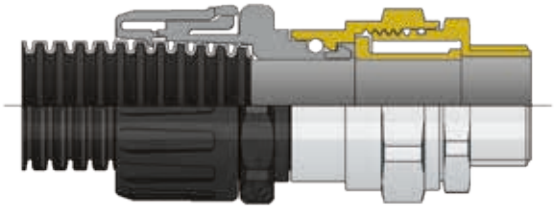


| nominal size (mm) | FPA part number | FPAX part number | FPAU part number | Use with Braided sleeving |
|---|---|---|---|---|
| 16 | | | | |
| 21 | FPA21-M20-SBCA | FPAX21-M20-SBCA | FPAU21-M20-SBCA | FTCB10, FTCB12, FTCB15 |
| 28 | FPA28-M25-SBCA | FPAX28-M25-SBCA | FPAU28-M25-SBCA | FTCB15, FTCB20, FTCB25 |
| 34 | FPA34-M32-SBCA | FPAX34-M32-SBCA | FPAU34-M32-SBCA | FTCB20, FTCB25, FTCB30 |
| 42 | FPA42-M40-SBCA | FPAX42-M40-SBCA | FPAU42-M40-SBCA | FTCB25, FTCB30, FTCB35 |
| 54 | | | | |

## Ordering Notes

- **Available on request:**
  - 90° and 45° elbows
  - PG threads

## Technical Drawing





# NRFPAS, NRFPAH & NRFPR conduit

## nylon corrugated flexible conduit

In accordance with **NR/L2/SIGELP/27421**

NetworkRail PA05/06589

# Non-Metallic Conduits




## NRFPAS

**Construction:** Standard weight, flame retardant nylon (PA6) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Providing mechanical protection and supplementary insulation to existing legacy cabling in accordance with **NR/L2/SIGELP/27421**.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- Lloyd's Register Type Approval
- UL recognised
- Low Fire Hazard (LFH), see page 8
- UL 94 V2 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant (black)
- Abrasion resistant
- Highly resistant to solvents and oils
- Slit version also available FPAS-S please contact us




## NRFPAH

**Construction:** Heavy weight, flame retardant, nylon (PA6) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Providing mechanical protection and supplementary insulation to existing legacy cabling in accordance with **NR/L2/SIGELP/27421**. Conduit offers higher mechanical strength than NRFPAS.

- High mechanical strength
- High impact resistance
- Temperature range -40˚C to +120˚C
- UL recognised
- Low Fire Hazard (LFH), see page 8
- UL 94 V2 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant
- Abrasion resistant
- Highly resistant to solvents and oils




## NRFPR

**Construction:** Standard weight nylon (highly flame retardant PA6) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Providing mechanical protection and supplementary insulation to existing legacy cabling in accordance with **NR/L2/SIGELP/27421**. Conduit offers enhanced fire performance properties than NRFPAS.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- UL recognised
- Lloyd's Register Type Approval
- Extra Low Fire Hazard (LFH)
- Compliant to LUL Std 1-085 - APR 298
- UL 94 V0 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant
- Abrasion resistant
- Highly resistant to solvents and oils
- EN45545-HL3

| european (NW) sizes | nominal size (mm) | pitch | NRFPAS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | NRFPAH part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | NRFPR part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 21 | F | 0086/008738 | 50 | 21.2 | 16.7 | 45 | | | | | | 0086/008746 | 50 | 21.2 | 16.7 | 45 |
| | 21 | C | | | | | | 0086/008754 | 50 | 21.2 | 15.5 | 55 | | | | | |
| 23 | 28 | F | 0086/008739 | 50 | 28.5 | 22.8 | 50 | | | | | | | | | | |
| 23 | 28 | C | | | | | | 0086/008755 | 50 | 28.5 | 21.3 | 60 | 0086/008747 | 50 | 28.5 | 21.7 | 50 |
| 29 | 34 | C | 0086/008740 | 25 | 34.5 | 28.1 | 60 | 0086/008756 | 25 | 34.5 | 27.6 | 70 | 0086/008748 | 50 | 34.5 | 28.1 | 60 |
| 36 | 42 | C | 0086/008741 | 25 | 42.5 | 35.5 | 70 | 0086/008757 | 25 | 42.5 | 34.6 | 80 | 0086/008749 | 25 | 42.5 | 35.5 | 70 |
| 48 | 54 | C | 0086/008742 | 25 | 54.5 | 47.2 | 80 | 0086/008758 | 25 | 54.5 | 46.0 | 90 | 0086/008750 | 25 | 54.5 | 47.2 | 80 |
| 56 | 67 | C | 0086/008743 | 10 | 67.2 | 56.3 | 130 | | | | | | 0086/008751 | 10 | 67.2 | 56.3 | 130 |
| 70 | 80 | C | 0086/008744 | 10 | 80.0 | 67.0 | 160 | | | | | | 0086/008752 | 10 | 80.0 | 67.0 | 160 |
| 90 | 106 | C | 0086/008745 | 10 | 106.0 | 91.5 | 210 | | | | | | 0086/008753 | 10 | 106.0 | 91.5 | 210 |

# NRFPIH, NRFPIHR & NRFPADS conduit

## nylon corrugated flexible conduit

In accordance with **NR/L2/SIGELP/27421**

NetworkRail

PA05/06589



## NRFPIH




**Construction:** Heavy weight nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Suitable for flood areas.

- Highly flexible and high fatigue life
- High mechanical strength
- High impact resistance even at very low temperatures
- UV resistant
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- UL recognised
- Highly resistant to solvents and oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus freeand oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus free

## NRFPIHR




**Construction:** Heavy weight, flame retardant nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Suitable for flood areas and offers enhanced fire performance properties over NRFPIH.

- Highly flexible and high fatigue life
- High mechanical strength
- High impact resistance even at very low temperatures
- UV resistant
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- UL recognised
- Highly resistant to solvents and oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus free
- EN45545-HL3

## NRFPADS



**Construction:** Double slit nylon (PA6) corrugated conduit.

**Colour:** Black.

**Typical Applications:** Suitable for retrofit.

- Made from 2 interlocking slit corrugated conduits
- Temperature range -40˚C to +120˚C
- Cables can be inserted laterally
- Provides abrasion resistance and routing of cables for static applications
- Self extinguishing
- Halogen, sulphur and phosphorus free
- UV resistant

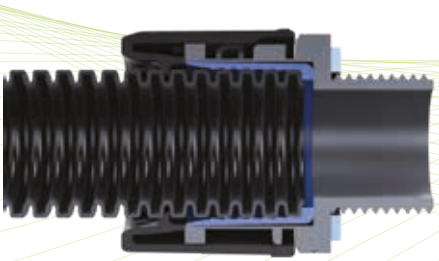
| NRFPIH part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | NRFPIHR part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | NRFPADS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | european (NW) sizes | nominal size (mm) | pitch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 0086/008759 | 50 | 21.2 | 13.9 | 120 | 17 | 21 | F |
| 0086/008764 | 50 | 21.2 | 15.0 | 45 | 0086/008770 | 50 | 21.2 | 15.0 | 45 | | | | | | | 21 | C |
| | | | | | | | | | | | | | | | 23 | 28 | F |
| 0086/008765 | 50 | 28.5 | 21.3 | 50 | 0086/008771 | 50 | 28.5 | 21.3 | 50 | 0086/008760 | 50 | 28.5 | 20.5 | 170 | 23 | 28 | C |
| 0086/008766 | 25 | 34.5 | 27.6 | 60 | 0086/008772 | 25 | 34.5 | 27.6 | 60 | 0086/008761 | 25 | 34.5 | 26.6 | 180 | 29 | 34 | C |
| 0086/008767 | 25 | 42.5 | 34.6 | 70 | 0086/008773 | 25 | 42.5 | 34.6 | 70 | 0086/008762 | 25 | 42.5 | 32.0 | 200 | 36 | 42 | C |
| 0086/008768 | 25 | 54.5 | 46.0 | 80 | 0086/008774 | 25 | 54.5 | 46.0 | 80 | 0086/008763 | 25 | 54.5 | 43.0 | 240 | 48 | 54 | C |
| 0086/008769 | 10 | 67.2 | 56.0 | 130 | | | | | | | | | | | 56 | 67 | C |
| | | | | | | | | | | | | | | | 70 | 80 | C |
| | | | | | | | | | | | | | | | 90 | 106 | C |

# Connectors & Approved Fittings & Glands

In accordance with **NR/L2/SIGELP/27422**

IP66 IP67 IP68 IP69

NetworkRail PA05/06589




## Fittings

### NRFPAU

EN 45545-2 HL3 NFPA 130 EXTRA LOW FIRE HAZARD ★★ Integrated Sealing Technology

One piece fast fit, external threaded fitting with integrated conduit seal. Suitable for knockouts or threaded entries. Supplied with locknut.

IP66 IP67 IP68 IP69



### NRFPAU 90

EN 45545-2 HL3 NFPA 130 EXTRA LOW FIRE HAZARD ★★ Integrated Sealing Technology

One piece fast fit, external threaded 90 degree elbow fitting with integrated conduit seal. Suitable for knockouts. Supplied with locknut.

IP66 IP67 IP68 IP69



### NRFPAU 45

EN 45545-2 HL3 NFPA 130 EXTRA LOW FIRE HAZARD ★★ Integrated Sealing Technology

One piece fast fit, external threaded with 45 degree elbow fitting with integrated conduit seal. Suitable for knockouts.

IP66 IP67 IP68 IP69



| nominal size (mm) | european (NW) sizes | NRFPAU Ext Metric | NRFPAU Thread Size | NRFPAU 90 Ext Metric | NRFPAU 90 Thread Size | NRFPAU 45 Ext Metric | NRFPAU 45 Thread Size |
|---|---|---|---|---|---|---|---|
| 21 | 17 | 0086/008782 | M20 | 0086/008795 | M20 | 0086/008790 | M20 |
| 21 | | | | | | | |
| 28 | 23 | 0086/008783 | M25 | 0086/008796 | M25 | 0086/008791 | M25 |
| 28 | 23 | | | | | | |
| 34 | 29 | 0086/008784 | M32 | 0086/008797 | M32 | 0086/008792 | M32 |
| 42 | 36 | 0086/008785 | M40 | 0086/008798 | M40 | 0086/008793 | M50 |
| 54 | 48 | 0086/008787 | M50 | 0086/008800 | M50 | 0086/008794 | M50 |
| 67 | 56 | 0086/008789* | M63 | | | | |
| 80 | 70 | | | | | | |
| 106 | 95 | | | | | | |

* FPAX fitting type

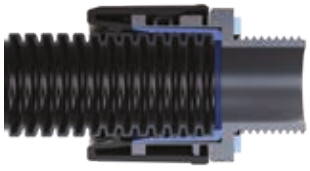
## Fine Pitch



## Coarse Pitch



## Technical Drawing



Integrated Sealing Technology

FLEXICON Ultra

## properties

**NRFPAU**

- Fast fit - True one piece component
- IP rating: for conduit & fitting **IP66 + IP67 + IP68 (2 bar) + IP68 (72hrs @ 1m) + IP69**
- PA66 Nylon moulded fitting
- Nylon threads supplied complete with glass reinforced nylon locknut
- Vibration and shock tested to EN61373 Cat 2
- Tamper resistant
- Low Fire Hazard (LFH) see page 8
- Halogen, sulphur and phosphorus free
- NR/L2/SIGELP/27422

NetworkRail PA05/06589



EN 45545-2 HL3 NFPA 130

## LARGE DIAMETER CLAMP FITTING

Straight flanged nylon clamp fitting with seals.

IP65



## 90° LARGE DIAMETER CLAMP FITTING

90° flanged nylon clamp fitting with seals.

IP65



## COUPLER

Fast fit coupler to join two corrugted conduits of the same nominal size.

IP66 IP67 IP68 IP69



| | | | european (NW) sizes | nominal size (mm) |
|---|---|---|---|---|
| | | 0086/008775 | 17 | 21 |
| | | | | 21 |
| | | 0086/008776 | 23 | 28 |
| | | | 23 | 28 |
| | | 0086/008777 | 29 | 34 |
| | | 0086/008778 | 36 | 42 |
| | | 0086/008779 | 48 | 54 |
| | | | 56 | 67 |
| 0086/008802 | 0086/008804 | | 70 | 80 |
| 0086/008803 | 0086/008805 | | 95 | 106 |

## Standards & Approvals

# End of Line Connectors and Approved Fittings & Accessories

In accordance with **NR/L2/SIGELP/27422**

IP66 IP67 IP68 IP69

NetworkRail PA05/06589

## Fittings

### NRFPAU EOL

EXTRA LOW FIRE HAZARD ★★

End of Line
Straight conduit fitting combined with nylon cable gland for strain relief and secondary sealing. EOL glands have long metric threads.

IP66 IP67 IP68
(2 bar)



### NRREC

Thermoplastic elastomer cap used to seal end of conduit. Can be cut to size depending on size of cable. Can be additionally secured using cable tie (not supplied).



### CLIPS

HL3 EN 45545-2 NFPA 130

Nylon conduit fixing clip for corrugated conduit with integral lid for increased security. Incorporates internal ribs to prevent corrugated conduit from pulling through.



| nominal size (mm) | european (NW) sizes | NRFPAU EOL | Clamp Range (mm) | NRREC | CLIPS |
|---|---|---|---|---|---|
| 21 | 17 | 0086/008832 | 7 - 12 | | 0086/008806 |
| 21 | | | | | |
| 28 | 23 | 0086/008833 | 13 - 18 | 0086/008824 | 0086/008807 |
| 28 | 23 | | | | |
| 34 | 29 | 0086/008834 | 18 - 25 | 0086/008825 | 0086/008808 |
| 42 | 36 | 0086/008835 | 22 - 32 | 0086/008826 | 0086/008809 |
| 54 | 48 | 0086/008836 | 30 - 38 | 0086/008827 | 0086/008810 |
| 67 | 56 | 0086/008837 | 34 - 44 | 0086/008828 | |
| 80 | 70 | | | 0086/008829 | |
| 106 | 95 | | | | |

## Standards & Approvals

FM58347 · UNDERGROUND · c UL us · CE · IRIS Certification ISO/TS 22163:2017 · RoHS · APPROVED · EN 45545-2 HL3 · NFPA 130 · NetworkRail · REACh

## properties

**NRFPAU**

- Fast fit - True one piece component
- IP rating: for conduit & fitting **IP66 + IP67 + IP68 (2 bar)**
- PA66 Nylon moulded fitting
- Nylon threads supplied complete with glass reinforced nylon locknut
- Vibration and shock tested to EN61373 Cat 2
- Low Fire Hazard (LFH) see page 8
- Halogen, sulphur and phosphorus free
- NR/L2/SIGELP/27422

NetworkRail
PA05/06589



EN 45545-2 HL3 NFPA 130

## NR FCLAMP

Nylon PA66, conduit fixing clamp for corrugated conduit. Suitable for use with with fine or coarse pitch conduits.



EN 45545-2 HL3 NFPA 130

## NR FCLAMP KIT

Nylon PA66, conduit fixing clamp for corrugated conduit, complete with two fixing bolts, two ½ zebedees (PNS06) and one plate.



## CONDUIT CUTTER

For any non-metallic flexible and rigid conduits.



| | | | european (NW) sizes | nominal size (mm) |
|---|---|---|---|---|
| 0086/008811 | NRFCLAMP-KIT21 | 0086/008830 | 17 | 21 |
| | | | | 21 |
| 0086/008812 | NRFCLAMP-KIT28 | 0086/008830 | 23 | 28 |
| | | | 23 | 28 |
| 0086/008813 | NRFCLAMP-KIT34 | 0086/008830 | 29 | 34 |
| 0086/008814 | NRFCLAMP-KIT42 | 0086/008831 | 36 | 42 |
| 0086/008815 | NRFCLAMP-KIT54 | 0086/008831 | 48 | 54 |
| 0086/008816 | NRFCLAMP-KIT67 | 0086/008831 | 56 | 67 |
| 0086/008817 | | | 70 | 80 |
| | | | 95 | 106 |





# Round Connection Boxes

Innovation is at the centre of everything we do.

NEW

## Simple and reliable connection boxes for specialist applications

**Flexicon can offer connection box solutions, engineered to provide unrivalled performance with a variety of both fine and coarse pitch conduits.**

With a removable lid the box provides access to your connections when necessary and maintains the integrity of your system throughout. Offering 4 way connection, the round box provides any combination of 16, 21, 28 and 34mm conduit connections.

The box can be configured for use in multiple ways, for example used as a through box or connected to provide a 90 degree solution. Further entries can be made via the lid or the base.







## Features and Benefits

Offering design flexibility, combined with the unrivalled benefits offered by Flexible Conduit, our Round Connection boxes are ideal for Performance & Safety Critical applications.

### Flexibility.

- 4 outlets - enables desired circuit configuration with maximum wiring space
- Suitable for 16, 21, 28 and 34mm entries - compatible with different cable sizes
- Compatible with a wide range of non-metallic Flexible Conduits

### Reliability and Performance.

- IP68 performance - offers Ingress Protection and System Integrity
- Conduit Connections have all round teeth - secures conduits in place
- Anti-tamper, Dynamic & Vibration performance

### Simplicity.

- Removable lid - can add circuits with easy access to wiring
- External Fixing positions - easy installation and mounting
- Speed of installation - Quick push fit connection



MADE IN THE UK

# The Ultimate in Flexibility

Several variants of sizes and connections to achieve specific requirements. Please contact us for selection.

NEW

IP67 IP68



## Different Conduit Connections -

• This range will accept different conduit types and sizes offering a flexible way of combining systems.





## Clear Lid Option

• If you are looking for visibility within the box then there is the option of a clear lid. This could be beneficial if you have status indicators or monitoring equipment connected.

## Different Terminations

• Suitable for use with a range of equipment and terminations other than just conduit.





## Maximum Wiring Space

• Suitable for mounting terminals or DIN Rail for wiring connections.

## Lid mounting options

• Can be used to mount sensors or equipment allowing the ultimate in flexibility, i.e. PIR detectors or Dusk / Dawn Sensors.





## Configurable Outlets

• Suitable for use as a through connection box or as a 90 degree. Simply blank off any unused outlets to maintain the Ingress Protection.



# Large diameter systems
## nylon

NEW

IP40 IP65 IP67+ IP68+

## Conduit

EN 45545-2 HL3 NFPA 130

EN 45545-2 HL3 NFPA 130

### LDFPAL

**Construction:** Light weight nylon (PA6) corrugated flexible conduit.

**Colour:** Black or Grey (RAL 7031).

**Typical Applications:** Machines where lower mechanical protection is required and buildings.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- Highly resistant to solvents and oils
- Self extinguishing
- Halogen, sulphur and phosphorus free

### LDFPAS

STANDARD LOW FIRE HAZARD *

**Construction:** Standard weight, flame retardant nylon (PA6) corrugated flexible conduit.

**Colour:** Black or Grey (RAL 7031). Orange available on request.*

**Typical Applications:** All types of machinery, public buildings.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- Lloyd's Register Type Approval
- Low Fire Hazard (LFH), see page 8
- UL 94 V2 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant (black)
- Abrasion resistant
- Highly resistant to solvents and oils

### LDFPIH

STANDARD LOW FIRE HAZARD *

**Construction:** Heavy weight nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Robots and continual flexing where higher mechanical strength required.

- Highly flexible and high fatigue life
- High mechanical strength
- High impact resistance even at very low temperatures
- UV resistant
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- Highly resistant to solvents and oils
- Self extinguishing
- Halogen, sulphur and phosphorus free
- Low Fire Hazard (LFH), see page 8

### LDFPR

EXTRA LOW FIRE HAZARD **

**Construction:** Standard weight nylon (highly flame retardant PA6) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Railways, underground and public buildings.

- Highly flexible and high fatigue life
- High impact strength and recovers if crushed
- Temperature range -40˚C to +120˚C (-20˚C to +100˚C for moving applications)
- Lloyd's Register Type Approval
- Extra Low Fire Hazard (LFH)
- Compliant to LUL Std S1085
- UL 94 V0 flame retardancy
- Halogen, sulphur and phosphorus free
- UV resistant
- Abrasion resistant
- Highly resistant to solvents and oils

### LDFPIHR

EXTRA LOW FIRE HAZARD **

**Construction:** Heavy weight nylon (PA12) corrugated flexible conduit.

**Colour:** Black.

**Typical Applications:** Where continual movement or flexing is required, with a higher mechanical strength even at very low temperatures such as on Bogies or Intercar Jumper assemblies. Rolling Stock applications requiring a superior level of fire performance.

- Highly flexible and high fatigue life
- High mechanical strength
- High impact resistance even at very low temperatures
- Excellent UV resistance
- Displays self recovery if crushed
- Temperature range -50˚C to +110˚C
- UL recognised
- Highly resistant to solvents and oils
- Self extinguishing
- Low fire hazard
- Halogen, sulphur and phosphorus free
- EN45545-HL3

| european (NW) sizes | nominal size (mm) | LDFPAL part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | LDFPAS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | LDFPIH part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | LDFPR part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | LDFPIHR part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 80 | LDFPAL80 | 10 | 80.0 | 67.0 | 150 | LDFPAS80 | 10 | 80.0 | 67.0 | 160 | LDFPIH80 | 10 | 80.0 | 66.5 | 170 | LDFPR80 | 10 | 80.0 | 67.0 | 160 | LDFPIHR80 | 10 | 80.0 | 66.5 | 170 |
| 95 | 106 | LDFPAL106* | 10 | 106.0 | 91.8 | 210 | LDFPAS106 | 10 | 106.0 | 91.5 | 210 | LDFPIH106* | 10 | 106.0 | 91.0 | 250 | LDFPR106* | 10 | 106.0 | 91.5 | 210 | LDFPIHR106* | 10 | 106.0 | 91.0 | 250 |

## Ordering Notes

- Specify black or grey (B = Black, G = Grey) eg: LDFPAS80B-10M for Black 10m reel
- **Available on request:**
  - longer lengths and bulk packaging
  - cut lengths and assemblies
  - alternative conduit material

+ Contact Flexicon for more details

- FCC75 and FCC106 PVC lined plated steel P-clips
- 80mm can be used with F-Clamps - see page 85

* Indicates parts made to order on request and may be subject to MOQ and lead time

## Standards & Approvals

**BS EN IEC 61386**

REACh RoHS EN 45545-2 HL3

APPROVED CE UNDERGROUND NFPA 130 IRIS Certification ISO/TS 22163:2017

**properties**

- Suitable for use with Large Diameter conduits
- Material
  - LDMP and LDMPS: nylon PA6
  - FCLAMP: nylon PA66
  - REC: thermoplastic elastomer
- Temperature Range
  - LDMP & LDMPS fittings: -40° to 120°
  - FCLAMP: -50° to 135°
  - REC: -50° to 120°
- UV resistant
- Fire Performance
  - **LDMP and LDMPS:**
    - Halogen, Sulphur & Phosphorous Free
    - Self extinguishing
  - **REC:**
    - Halogen, Sulphur & Phosphorous Free
  - **FCLAMP:**
    - Extra Low Fire Hazard see page 8
    - Halogen, Sulphur & Phosphorous Free
    - Self extinguishing
    - EN45545-HL3 and NFPA 130 compliant

NEW

# Fittings

## LDMP

**straight flanged nylon clamp fitting**

Flanged body with 2 clamps.

IP40

## LDMPS

**straight flanged nylon clamp fitting with seals**

Flanged body with 2 clamps and seals.

IP65 IP67+ IP68+

## LDMP90

**90° flanged nylon clamp fitting**

Flanged 90° body with 2 clamps.

IP40

## LDMPS90

**90° flanged nylon clamp fitting with seals**

Flanged 90° body with 2 clamps and seals.

IP65

## FCLAMP

**non-metallic, heavy duty conduit clamp**

Nylon PA66, conduit fixing clamp for corrugated conduit. Suitable for use with with fine or coarse pitch conduits. Can be used with a range of accessories including cover plates and weld plates (available contact Flexicon for more details).

## REC

**rubber end cap**

Thermoplastic elastomer cap used to seal end of conduit. Can be cut to size depending on size of cable. Can be additionally secured using cable tie (not supplied).

## FCC CLIPS

**plated steel P clip with pvc liner**

P clip to support and secure conduit.



| termination | part number | termination | part number | termination | part number | termination | part number | part number | part number | part number | european (NW) sizes | nominal size (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FL | LDMP-80-FL | FL | LDMPS-80-FL | FL | LDMP90-80-FL | FL | LDMPS90-80-FL | FCLAMP-8-80 | REC80 | FCC75 | 70 | 80 |
| FL | LDMP-106-FL | FL | LDMPS-106-FL | FL | LDMP90-106-FL | FL | LDMPS90-106-FL | | | FCC106 | 95 | 106 |



- **Also available:**
  - FPA80-M85 (2mm Pitch thread)



# Metallic conduit selection guide

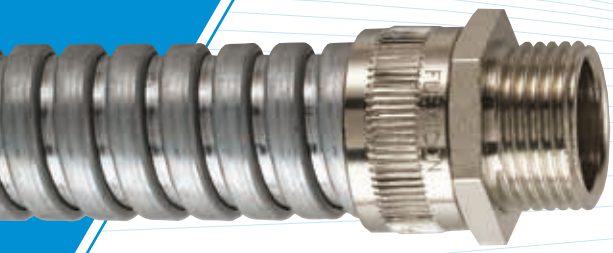
IRIS Certification ISO/TS 22163:2017

| Conduit System | | FU | SSU | FSU | LFHU | FPU | LTP | LTPHC | LTPLFH |
|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |
| IP Rating | IP40 | ● | ● | | | | | | |
| | IP54 | | | ● | ● | ● | | | |
| | IP65 | | | ● | ● | ● | | | |
| | IP66 | | | | | | ● | ● | ● |
| | IP67 | | | | | | ● | ● | ● |
| | IP68 | | | | | | ● | ● | ● |
| | IP69 | | | | | | ● | ● | ● |
| Compression Strength (kg/100mm) | | 350 | 400 | 350 | 350 | 350 | 400 | 400 | 400 |
| Pull Off Strength (kg) for 20mm size | | 120 | 170 | 120 | 120 | 120 | 130 | 130 | 130 |
| Min Bend Radius (mm) for 20mm size | | 45 | 45 | 45 | 45 | 45 | 65 | 65 | 100 |
| Colours | | zinc | stainless steel | black, grey, orange | black | black, blue | black, grey, orange | black | black |
| High Fatigue Life | | | | ● | | ● | | | |
| Temp | Max | 300˚C | 600˚C | 70˚C | 90˚C | 100˚C | 105˚C | 150˚C | 90˚C |
| | Min | -100˚C | -100˚C | -15˚C | -25˚C | -40˚C | -20˚C | -60˚C | -25˚C |
| Category | Flexible | ● | ● | ● | ● | ● | ● | ● | ● |
| | Pliable | | | | | | | | |
| Low Fire Hazard | *** Inerent<br>** Extra<br>* Standard | INHERENT LOW FIRE HAZARD *** | INHERENT LOW FIRE HAZARD *** | | EXTRA LOW FIRE HAZARD ** | | | | EXTRA LOW FIRE HAZARD ** |
| | Halogen Free | ● | ● | | ● | ● | | ● | ● |
| | Self Extinguishing | ● | ● | ● | ● | ● | ● | ● | ● |
| Fire Tests | EN 45545-2 | ● | ● | | ● | | | | ● |
| | NFPA-130 | ● | ● | | ● | | | | ● |
| Abrasion Resistance | | ● | ● | | | ● | | | |
| Resistance to solvents | | ● | ● | | | ● | | ● | |
| UV Resistance | | ● | ● | ● | | | ● | ● | ● |
| EMC Performance | | | | | | | | | |
| Anti-Static | | AS ANTI-STATIC | AS ANTI-STATIC | | | | | | |
| Approvals | Lloyds | | | | ● | | ● | | |
| | TFL London Underground | ● | ● | | ● | | | | ● |
| ROHS | | ● | ● | ● | ● | ● | ● | ● | ● |
| REACH | | ● | ● | ● | ● | ● | ● | ● | ● |
| Page Number | | 68 | 68 | 70 | 70 | 70 | 72 | 72 | 72 |

# Metallic conduit selection guide

IRIS™ Certification ISO/TS 22163:2017

| | LTPPU | LTBRDP | LTBRDLFH | FB | FUSSB | LFHUBRD | FSS | FSSBRD |
|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |   |   |
| | | | | ● | ● | | | |
| | | | | | | ● | | |
| | | | | | | ● | | |
| | ● | ● | ● | | | | | |
| | ● | ● | ● | | | | | |
| | ● | ● | ● | | | | ● | ● |
| | ● | ● | ● | | | | | |
| | 400 | 400 | 400 | 350 | 350 | 350 | 1000 | 1000 |
| | 130 | 130 | 130 | 120 | 120 | 120, 300 | 100 | 150 |
| | 65 | 65 | 130 | 45 | 45 | 45 | 45 | 60 |
| | black, blue | black | black | zinc | stainless steel | stainless steel | stainless steel, black | stainless steel |
| | ● | | | | | | | |
| | 100˚C | 105˚C | 90˚C | 300˚C | 300˚C | 90˚C | 400˚C | 400˚C |
| | -40˚C | -20˚C | -25˚C | -100˚C | -100˚C | -25˚C | -100˚C | -100˚C |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | | | | | | | ● | ● |
| | | | EXTRA LOW FIRE HAZARD ** | INHERENT LOW FIRE HAZARD *** | INHERENT LOW FIRE HAZARD *** | EXTRA LOW FIRE HAZARD ** | INHERENT LOW FIRE HAZARD *** | INHERENT LOW FIRE HAZARD *** |
| | ● | | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | | | ● | ● | ● | ● | ● | ● |
| | | | ● | ● | ● | ● | ● | ● |
| | ● | | | ● | ● | ● | ● | ● |
| | ● | | | ● | ● | | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | | ENHANCED EMC SCREEN ** | ENHANCED EMC SCREEN ** | STANDARD EMC SCREEN * | STANDARD EMC SCREEN * | STANDARD EMC SCREEN * | STANDARD EMC SCREEN * | STANDARD EMC SCREEN * |
| | | | | AS ANTI-STATIC | AS ANTI-STATIC | AS ANTI-STATIC | AS ANTI-STATIC | AS ANTI-STATIC |
| | | | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | 73 | 73 | 73 | 76 | 76 | 78 | 80 | 80 |



# **FU & SSU** system
galvanised steel
and stainless steel

INHERENT LOW FIRE HAZARD ★★★

## Conduit

### FU

INHERENT LOW FIRE HAZARD ★★★



**Construction:** Galvanised steel, helically wound, flexible conduit.

**Colour:** Zinc, self colour.

**Typical Applications:** Underfloor wiring in office blocks inherent low fire hazard applications typically interior applications due to IP40 rating.

HL3 EN 45545-2 NFPA 130

### SSU

INHERENT LOW FIRE HAZARD ★★★



**Construction:** Stainless steel (grade 316L), helically wound, flexible conduit.

**Colour:** Stainless steel, self colour.

**Typical Applications:** Instrumentation and security or where enhanced corrosion performance is required.

HL3 EN 45545-2 NFPA 130

## Fittings

### M

**fixed external thread nickel plated brass**

Two part fitting comprising shell and body with external thread. This fitting can be inserted into a knockout and secured with a locknut.

IP40

### M-SS

**fixed external thread stainless steel**

Two part fitting comprising shell and body with external thread. This fitting can be inserted into a knockout and secured with a locknut.

IP40

### S

**swivel external thread nickel plated brass**

Two part fitting comprising shell and body. The external thread swivels about the main body. Can be used with threaded entries, or knockout secured with a locknut.

IP40



| nominal size (mm) | FU part number | FU reel length (m) | SSU part number | SSU reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | M metric thread part number | M PG thread part number | M-SS metric thread part number | S metric thread part number | S PG thread part number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | FU10+ | 25, 50 | SSU10+ | 10, 25, 50 | 9.0 | 6.8 | 25 | FU10-M12-M | FU10-PG7-M | SSU10-M12-M | FU10-M12-S | FU10-PG7-S |
| 12 | FU12 | 25, 50 | SSU12+ | 10, 25, 50 | 13.0 | 10.2 | 30† | FU12-M16-M | FU12-PG9-M | SSU12-M16-M | FU12-M16-S | FU12-PG9-S |
| 16 | FU16 | 10, 25, 50 | SSU16 | 10, 25, 50 | 16.0 | 13.0 | 40 | FU16-M16-M | FU16-PG11-M | SSU16-M16-M | FU16-M16-S | FU16-PG11-S |
| 16 | | | | | | | | FU16-M20-M | | | FU16-M20-S | FU16-PG13-S |
| 20 | FU20 | 10, 25, 50 | SSU20 | 10, 25 | 20.5 | 16.9 | 45 | FU20-M20-M | FU20-PG16-M | SSU20-M20-M | FU20-M20-S | FU20-PG16-S |
| 25 | FU25 | 10, 25, 50 | SSU25 | 10, 25 | 25.0 | 21.1 | 55 | FU25-M25-M | FU25-PG21-M | SSU25-M25-M | FU25-M25-S | FU25-PG21-S |
| 32 | FU32 | 10, 25 | SSU32 | 10, 25 | 32.0 | 28.1 | 60 | FU32-M32-M | FU32-PG29-M | SSU32-M32-M | FU32-M32-S | FU32-PG29-S |
| 40 | FU40 | 10, 25 | SSU40 | 10 | 42.5 | 37.6 | 80 | FU40-M40-M | FU40-PG36-M | SSU40-M40-M | FU40-M40-S | FU40-PG36-S |
| 50 | FU50 | 10, 25 | SSU50 | 10 | 53.0 | 48.4 | 90 | FU50-M50-M | FU50-PG48-M | SSU50-M50-M | FU50-M50-S | FU50-PG42-S |
| 63 | FU63 | 10 | SSU63* | 10 | 62.5 | 57.5 | 115 | FU63-M63-M | | SSU63-M63-M* | FU63-M63-S | |
| 75 | FU75 | 10 | | | 77.0 | 70.0 | 150 | FU75-M75-M | | | | |

## Ordering Notes

- Add reel length eg: FU20-25M for 25m reel

* Indicates parts made to order on request and may be subject to MOQ and lead time

\+ Double interlock section

† SSU12 Minimum bend radius is 50mm

- **Available on request:**
  - longer lengths and bulk packaging
  - cut lengths and assemblies
  - alternative threads

## How to read the fittings code

FU10-M12-M

- conduit
- thread size
- fitting type

## properties

- High mechanical strength
- Highly flexible
- Inherently Low Fire Hazard (LFH) see page 148
- Fully compliant to LUL Std S1085 (Cert No. 296)
- Temperature range
  **-100˚C to +300˚C (FU)**
  **-100˚C to +600˚C (SSU + SS fittings)**
  **-100˚C to +400˚C (SSU + NPB fittings)**
- IP rating: IP40
- **SSU is highly corrosion resistant**
- **Nickel plated brass fittings**
- **Stainless steel (316L) fittings**
- **EN 45545 HL3 and NFPA130 compliant**



### S-SS

**swivel external thread stainless steel**

Two part fitting comprising shell and body. The external thread swivels about the main body. Can be used with threaded entries, or knockout secured with a locknut.

IP40

### P

**plain hole connector nickel plated brass**

Two part fitting comprising shell and body without thread. The body is fitted through the opposite side of the entry to the conduit and acts as a locking device also providing a smooth entry bush.

IP40

### F

**fixed internal thread nickel plated brass**

Two part fitting comprising shell and body with internal thread which can be used to connect with an external thread.

IP40

### FCC

**plated steel P clip with pvc liner and secure stainless steel P clips**

P clip to support and secure conduit.

### 90° elbow

**internal and external threaded nickel plated brass elbow**

90˚ elbow which can be screwed onto external threaded fittings to create a 90° elbow termination.











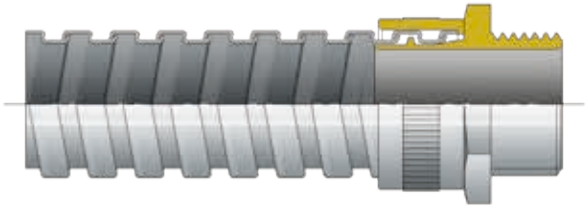
| metric thread part number | hole size (mm) | part number | metric thread part number | plated steel part number | stainless steel part number | part number | nominal size (mm) |
|---|---|---|---|---|---|---|---|
| SSU10-M12-S | 9 | FU10-P | | FCC10 | FCC10-SS* | | 10 |
| SSU12-M16-S | 12 | FU12-P | | FCC12 | FCC12-SS | BM90-16M | 11 |
| SSU16-M16-S | 16 | FU16-P | FU16-M16-F | FCC16 | FCC16-SS | BM90-16M | 13 |
| | | | FU16-M20-F | FCC16 | FCC16-SS | BM90-20M | 13 |
| SSU20-M20-S | 20 | FU20-P | FU20-M20-F | FCC20 | FCC20-SS | BM90-20M | 16 |
| SSU25-M25-S | 25 | FU25-P | FU25-M25-F | FCC25 | FCC25-SS | BM90-25M | 18 |
| SSU32-M32-S | 32 | FU32-P | FU32-M32-F | FCC32 | FCC32-SS | BM90-32M | 20 |
| | 40 | FU40-P | FU40-M40-F | FCC40 | FCC40-SS | BM90-40M | 21 |
| | 51 | FU50-P | FU50-M50-F | FCC50 | FCC50-SS | BM90-50M | 25 |
| | 61 | FU63-P | FU63-M63-F | FCC63 | FCC63-SS* | | 28 |
| | 75 | FU75-P | | FCC75 | | | 34 |

## Standards & Approvals

IRIS Certification ISO/TS 22163:2017 · UNDERGROUND · BS EN IEC 61386 · CE · EN 45545-2 HL3 · REACh · RoHS · NFPA 130

Note: refer to conduit properties for applicable standards

## Technical Drawing





# **FSU** system
galvanised steel pvc or nylon coated
# **LFHU** system
galvanised steel LFH coated
# **FPU** system
galvanised steel polyurethane coated

EXTRA LOW FIRE HAZARD ★★

## Conduit

### FSU



**Construction:** Galvanised steel, helically wound, flexible conduit with pvc coating.

**Colour:** Black. Grey or Orange on request.*

**Typical Applications:** General factory wiring and connections to machines.

### LFHU



EXTRA LOW FIRE HAZARD ★★

**Construction:** Galvanised steel, helically wound, flexible steel conduit with Low Fire Hazard (LFH) coating.

**Colour:** Black.

**Typical Applications:** Public and commercial buildings and tunnels where low fire hazard performance is a requirement.

HL3 EN 45545-2 NFPA 130

### FPU



**Construction:** Galvanised steel, helically wound, flexible steel conduit with low temperature, high abrasion, high fatigue life halogen free polyurethane coating.

**Colour:** Black and Metallic Blue.

**Typical Applications:** Where low temperature and mechanical strength are important.

## Fittings

### M

**fixed external thread nickel plated brass**

Two part fitting comprising shell and body with external thread. This fitting can be inserted into a knockout and secured with a locknut.

IP54

### S

**swivel external thread nickel plated brass**

Two part fitting comprising shell and body. The external thread swivels about the main body. Can be used with threaded entries, or knockout secured with a locknut.

IP54

### P

**plain hole connector nickel plated brass**

Two part fitting comprising shell and body without thread. The body is fitted through the opposite side of the entry to the conduit and acts as a locking device also providing a smooth entry bush.

IP54



| nominal size (mm) | FSU part number | LFHU part number | reel length (m) | FPU part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | M metric thread part number | M PG thread part number | S metric thread part number | S PG thread part number | hole size (mm) | P part number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | FSU12B | LFHU12B* | 10†, 25, 50 | FPU12B* | 25 | 14.0 | 10.2 | 30 | FSU12-M16-M | FSU12-PG9-M | FSU12-M16-S | FSU12-PG9-S | 12 | FSU12-P |
| 16 | FSU16B | LFHU16B | 10, 25, 50 | FPU16B | 25 | 17.0 | 13.0 | 40 | FSU16-M16-M | FSU16-PG11-M | FSU16-M16-S | FSU16-PG11-S | 16 | FSU16-P |
| 16 | | | | | | | | | FSU16-M20-M | | FSU16-M20-S | FSU16-PG13-S | | |
| 20 | FSU20B | LFHU20B | 10, 25, 50 | FPU20B | 25, 50 | 21.5 | 16.9 | 45 | FSU20-M20-M | FSU20-PG16-M | FSU20-M20-S | FSU20-PG16-S | 20 | FSU20-P |
| 25 | FSU25B | LFHU25B | 10, 25, 50 | FPU25B | 25, 50 | 26.0 | 21.1 | 55 | FSU25-M25-M | FSU25-PG21-M | FSU25-M25-S | FSU25-PG21-S | 25 | FSU25-P |
| 32 | FSU32B | LFHU32B | 10, 25 | FPU32B | 25 | 34.0 | 28.1 | 80 | FSU32-M32-M | FSU32-PG29-M | FSU32-M32-S | FSU32-PG29-S | 32 | FSU32-P |
| 40 | FSU40B | LFHU40B | 10, 25 | FPU40B* | 10 | 44.5 | 37.6 | 90 | FSU40-M40-M | FSU40-PG36-M | FSU40-M40-S | FSU40-PG36-S | 40 | FSU40-P |
| 50 | FSU50B | LFHU50B | 10, 25 | FPU50B* | 10 | 55.0 | 48.4 | 100 | FSU50-M50-M | FSU50-PG48-M | FSU50-M50-S | FSU50-PG42-S | 51 | FSU50-P |
| 63 | FSU63B | LFHU63B | 10 | FPU63B* | 10 | 64.5 | 57.5 | 115 | FSU63-M63-M | | FSU63-M63-S | | 61 | FSU63-P |
| 75 | FSU75B | LFHU75B | 10 | FPU75B* | 10 | 79.0 | 70.0 | 150 | FSU75-M75-M | | | | 75 | FSU75-P |

## Ordering Notes

- Add reel length eg: LFHU20B-25M for 25m reel
- FSU fittings used on LFHU conduit
- For metallic blue change B to BU eg FPU20BU-25M



* Indicates parts made to order on request and may be subject to MOQ and lead time

† 10m length for FSU ONLY

- **Available on request:**
  - longer lengths and bulk packaging
  - cut lengths and assemblies additional sizes
  - stainless steel fittings (grade 316L)
  - alternative threads
  - 45° C type elbows 16 to 32mm

## How to read the fittings code

**FSU10-M12-M**

- conduit
- thread size
- fitting type

## properties

- High mechanical strength
- Highly flexible
- IP rating: IP54 with standard fittings, IP65 with type C compression fittings
- **Extra low Fire Hazard UL94 V0, for LFH** **see page 8**
- **High fatigue life and high abrasion resistant (FPU)**
- Halogen, sulphur and phosphorus free
- **Compliant to LUL Std S1085 (LFHU) (Cert No. 297)**
- EN45545-2 HL3 for LFHU and NFPA 130
- Temperature range: **-25˚C to +90˚C (LFHU) -40˚C to +100˚C (FPU)**
- Nickel plated brass fittings
- Vibration and shock tested to EN61373 Cat 2



### F

**fixed internal thread nickel plated brass**

Two part fitting comprising shell and body with internal thread which can be used to couple two pieces of conduit together when used with a swivel fitting.

IP54

### C

**external thread nickel plated brass**

Multipart compression fitting including elastomeric seal. Can be used for knockouts or threaded entries as fitting rotates until tightened.

IP65

### C-S

**external thread nickel plated brass**

Multipart compression fitting including elastomeric seal.

The external thread swivels about the main body even after tightening.

IP65

### C90

**external thread elbow nickel plated brass**

Multipart 90˚ compression fitting including elastomeric seal.

IP65

### coupler

**external thread elbow nickel plated brass**

Multipart 90˚ compression fitting including elastomeric seal.

IP65

### E

**insert nickel plated brass**

Single part, machined insert to cap end of conduit.



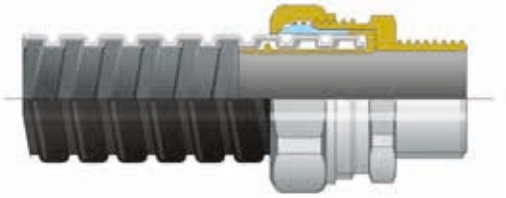
| F metric thread part number | C metric thread part number | C PG thread part number | C NPT thread part number | C-S metric thread part number | C90 metric thread part number | coupler part number | E part number | nominal size (mm) |
|---|---|---|---|---|---|---|---|---|
| | FSU12-M16-C | FSU12-PG9-C | | FSU12-M16-C-S | FSU12-M16-C90 | | FSU12-E | 12 |
| FSU16-M16-F | FSU16-M16-C | FSU16-PG11-C | FSU16-050-C | FSU16-M16-C-S | FSU16-M16-C90 | FSU16-FSU16 | FSU16-E | 16 |
| FSU16-M20-F | FSU16-M20-C | FSU16-PG13-C | | FSU16-M20-C-S | FSU16-M20-C90 | | FSU16-E | 16 |
| FSU20-M20-F | FSU20-M20-C | FSU20-PG16-C | FSU20-050-C | FSU20-M20-C-S | FSU20-M20-C90 | FSU20-FSU20 | FSU20-E | 20 |
| FSU25-M25-F | FSU25-M25-C | FSU25-PG21-C | FSU25-075-C | FSU25-M25-C-S | FSU25-M25-C90 | FSU25-FSU25 | FSU25-E | 25 |
| FSU32-M32-F | FSU32-M32-C | FSU32-PG29-C | FSU32-100-C | FSU32-M32-C-S | FSU32-M32-C90 | FSU32-FSU32 | FSU32-E | 32 |
| FSU40-M40-F | FSU40-M40-C | | | | | | FSU40-E | 40 |
| FSU50-M50-F | FSU50-M50-C | | | | | | FSU50-E | 50 |
| FSU63-M63-F | | | | | | | FSU63-E | 63 |
| | | | | | | | FSU75-E | 75 |

## Standards

BS EN IEC 61386

Note: refer to conduit properties for applicable standards

## Technical Drawing



# Metallic Conduits



## LTP

**Construction:** Galvanised steel, helically wound, flexible conduit with smooth oil resistant and high temperature PVC cover.

**Colour:** Black. Grey or Orange on request

**Typical Applications:** High mechanical strength combined with extremely high IP rating (IP68 and IP69) suitable for external applications where fire performance is not a consideration such as external car park barriers and systems.

**Special Characteristics:** Oil resistant and self extinguishing.

- High mechanical strength
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Smooth, wipe clean outer cover
- Cover does not wrinkle when bent
- Temperature range -20˚C to +105˚C
- Good flexibility
- Lloyd's Register Type Approval
- Resistant to oils and greases
- Vibration and shock tested to EN61373 Cat 2
- Black, Grey and Orange are UV resistant and suitable for external use




## LTPLFH

**Construction:** Galvanised steel, helically wound, flexible conduit with smooth oil resistant Low Fire Hazard (LFH) cover.

**Colour:** Black

**Typical Applications:** High mechanical strength combined with extremely high IP rating (IP68 and IP69) suitable for internal and external applications where fire performance is a requirement. APR 2020.

**Special Characteristics:** As per LTP but where Extra Low Fire Hazard performance is required.

- High mechanical strength
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Smooth, wipe clean outer cover
- Cover does not wrinkle when bent
- Temperature range -25˚C to +90˚C (LTPLFH)
- Good flexibility
- UV resistant (black) and suitable for external use
- Resistant to oils and greases
- EXTRA Low Fire Hazard UL94 V0 (for LFH see page 148)
- Compliant to LUL Std S1085 (LTPLFH) Cert No. 2020
- EN 45545 to HL3 and NFPA130 compliant
- Vibration and shock tested to EN61373 Cat 2



## LTPHC

**Construction:** Galvanised steel, helically wound, flexible conduit with smooth thermoplastic elastomer (TPE) cover.

**Colour:** Black

**Typical Applications:** High mechanical strength combined with high and low temperature performance, combined with extremely high IP rating (IP68 and IP69) suitable for external applications where fire performance is not a consideration.

**Special Characteristics:** Wide temperature range performance. Good flexibility at low and high temperatures.

- High mechanical strength
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Smooth, wipe clean outer cover
- Cover does not wrinkle when bent
- Temperature range -60˚C to +150˚C
- Good flexibility
- UV resistant (black) and suitable for external use
- Resistant to oils and greases
- Vibration and shock tested to EN61373 Cat 2

| nominal size (mm) | US trade size (") | outside dia (mm) | inside dia (mm) | LTP | part number | reel length (m) | min inside bend radius (mm) | LTPLFH | part number | reel length (m) | min inside bend radius (mm) | LTPHC | part number | reel length (m) | min inside bend radius (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | ¼ | 11.8 | 7.0 | LTP10B+ | | 50 | 35 | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 12 | 5⁄16 | 14.2 | 10.0 | LTP12B | | 25, 50 | 40 | | | | | LTPHC12B+ | | 25 | 40 |
| 16 | ⅜ | 17.8 | 12.6 | LTP16B | | 10, 25, 50 | 45 | LTPLFH16B | | 25 | 60 | LTPHC16B | | 25 | 45 |
| 16 | | | | | | | | | | | | | | | |
| 20 | ½ | 21.1 | 16.0 | LTP20B | | 10, 25, 50 | 65 | LTPLFH20B | | 25 | 100 | LTPHC20B | | 25 | 65 |
| 25 | ¾ | 26.4 | 21.0 | LTP25B | | 10, 25, 50 | 100 | LTPLFH25B | | 25 | 130 | LTPHC25B | | 25 | 100 |
| 32 | 1 | 33.1 | 26.5 | LTP32B | | 10, 25, 50 | 135 | LTPLFH32B | | 10 | 180 | LTPHC32B | | 25 | 135 |
| 40 | 1¼ | 41.8 | 35.4 | LTP40B | | 10, 25 | 175 | | | | | LTPHC40B | | 10 | 175 |
| 50 | 1½ | 47.9 | 40.4 | LTP50B+ | | 10, 25 | 230 | | | | | LTPHC50B+ | | 10 | 230 |
| 63 | 2 | 59.7 | 51.6 | LTP63B+ | | 10, 25 | 280 | | | | | LTPHC63B*+ | | 10 | 280 |

# Ordering Notes

- Add reel length eg: LTP20B-25M for a 25m reel
- For LTP specify colour (B = Black, G = Grey)

* Indicates parts made to order on request and may be subject to MOQ and lead time

\+ Double interlock section

\# PG & NPT threads not supplied with insulated throats

- **Available on request:**
  - longer lengths and bulk packaging
  - cut lengths and assemblies
  - C-S with PG threads
  - other colours
  - internal thread fittings

EN 45545-2 HL3 NFPA 130

## LTPPU



**Construction:** Galvanised steel, helically wound, flexible steel conduit with smooth halogen free polyurethane cover.

**Colour:** Black (B) and Blue (BU)(RAL 5012)

**Typical Applications:** High mechanical strength with low temperature and high abrasion resistance, combined with extremely high IP rating (IP68 and IP69) suitable for external applications where fire performance is not a requirement.

**Special Characteristics:** Low temperature performance, high abrasion and high fatigue life.

- High mechanical strength
- Good flexibility
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Smooth, wipe clean outer cover
- Cover does not wrinkle when bent
- Resistant to oils & greases
- Temperature range: -40˚C to +100˚C
- UV resistant and suitable for external use
- High abrasion, high fatigue life
- Vibration and shock tested to EN61373 Cat 2

## LTBRDP

NEW ENHANCED EMC SCREEN



**Construction:** Galvanised steel, helically wound, flexible conduit with galvanised steel braid and oil resistant and high temperature pvc smooth cover.

**Colour:** Black

**Typical Applications:** Machinery or outdoor applications where high corrosion resistance and liquid tight are a requirement combined with EMC screening

**Special Characteristics:** Good flexibility and EMC screening.

- High mechanical strength
- Good flexibility
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Smooth, wipe clean outer cover
- Cover does not wrinkle when bent
- Resistant to oils & greases
- Temperature range: -20˚C to +105˚C
- UV resistant and suitable for external use
- Vibration and shock tested to EN61373 Cat 2
- Provides EMC screening

## LTBRDLFH

NEW ENHANCED EMC SCREEN EXTRA LOW FIRE HAZARD



**Construction:** Galvanised steel, helically wound, flexible conduit with smooth oil resistant Low Fire Hazard (LFH) cover.

**Colour:** Black

**Typical Applications:** Installations where liquid tight is a requirement and where low fire hazard properties and EMC screening are required.

**Special Characteristics:** As per LTP but where Extra Low Fire Hazard performance is required.

- High mechanical strength
- Good flexibility
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Smooth, wipe clean outer cover
- Cover does not wrinkle when bent
- Resistant to oils & greases
- Temperature range: -20˚C to +90˚C
- UV resistant and suitable for external use
- Vibration and shock tested to EN61373 Cat 2
- Provides EMC screening
- Extra Low Fire Hazard UL94 V0 (for LFH see page 8)
- Compliant to LUL Std S1085 (Cert No. 658)
- EN 45545 to HL3 and NFPA 130 compliant

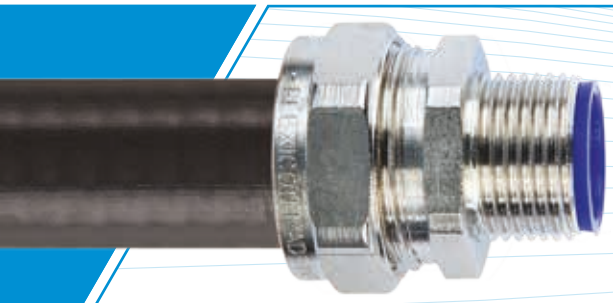
| LTPPU part number | inside dia (mm) | min inside bend radius (mm) | LTBRDP part number | inside dia (mm) | min inside bend radius (mm) | LTBRDLFH part number | reel length (m) | min inside bend radius (mm) | nominal size (mm) |
|---|---|---|---|---|---|---|---|---|---|
| LTPPU10* | 25 | 35 | | | | | | | 10 |
| LTPPU12* | 25 | 40 | | | | | | | 10 |
| LTPPU16* | 25 | 45 | | | | | | | 12 |
| | | | | | | | | | 16 |
| LTPPU20* | 25 | 65 | LTBRDP20B | 25 | 65 | LTBRDLFH20B | 25 | 130 | 16 |
| LTPPU25* | 25 | 100 | LTBRDP25B | 25 | 100 | LTBRDLFH25B | 25 | 200 | 20 |
| LTPPU32* | 25 | 135 | LTBRDP32B | 25 | 120 | LTBRDLFH32B* | 25 | 270 | 25 |
| LTPPU40* | 10 | 175 | LTBRDP40B | 10 | 140 | | | | 32 |
| LTPPU50*+ | 10 | 230 | LTBRDP50B+ | 10 | 180 | | | | 40 |
| LTPPU63*+ | 10 | 280 | LTBRDP63B+ | 10 | 270 | | | | 50 |
| | | | | | | | | | 63 |

# Standards

IRIS Certification ISO/TS 22163:2017 · IECEx · BSI FM 56347 · UNDERGROUND · IEC EN 61386 · CE · LR APPROVED TYPE APPROVAL SCHEME

RoHS ✓ · REACh ✓ · EN 45545-2 HL3 NFPA 130

Note: refer to conduit properties for applicable standards



# **Liquid Tight Conduit** fittings
## nickel plated brass fittings

IP66 IP67 IP68 IP69

# Fittings

### C

**external thread nickel plated brass**

Multipart compression fitting including elastomeric seal. Can be used for knockout or threaded entries as fitting rotates until tightened.

IP66 IP67 IP68 IP69

### C-S

**swivel external thread nickel plated brass**

Compression fitting for knockout or threaded entries.

Multipart compression fitting including elastomeric seal. The external thread swivels about the main body even after tightening.

IP66 IP67 IP68 IP69

### C-F NEW

**internal thread nickel plated brass**

Multi part compression fitting including elastomeric seal to connect with an external thread.

IP66 IP67 IP68 IP69

### C-SF NEW

**swivel internal thread nickel plated brass**

Multi part compression fitting including elastomeric seal. Swivel internal thread makes it suitable for connection to male threads. Internal thread swivels about the main body even after tightening.

IP66 IP67 IP68 IP69



#







| nominal size (mm) | US trade size (") | outside dia (mm) | inside dia (mm) | metric thread part number | for PG thread size | | for NPT thread size | metric thread part number | metric thread part number | metric thread part number |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | ¼ | 11.8 | 7.0 | LTP10-M12-C | PG7 | | | | | |
| 10 | | | | LTP10-M16-C | | | | | | |
| 12 | 5/16 | 14.2 | 10.0 | LTP12-M16-C | PG9 | | | LTP12-M16-S | | |
| 16 | ⅜ | 17.8 | 12.6 | LTP16-M16-C | PG11 | 050 | (½") | LTP16-M16-S | | |
| 16 | | | | LTP16-M20-C | PG13 | 050 | (½") | LTP16-M20-S | | LTP16-M20-SF |
| 20 | ½ | 21.1 | 16.0 | LTP20-M20-C | PG16 | 050 | (½") | LTP20-M20-S | LTP20-M20-F | LTP20-M20-SF |
| 25 | ¾ | 26.4 | 21.0 | LTP25-M25-C | PG21 | 075 | (¾") | LTP25-M25-S | LTP25-M25-F | LTP25-M25-SF |
| 32 | 1 | 33.1 | 26.5 | LTP32-M32-C | PG29 | 100 | (1") | LTP32-M32-S | LTP32-M32-F | |
| 40 | 1¼ | 41.8 | 35.4 | LTP40-M40-C | PG36 | 125 | (1¼") | LTP40-M40-S | LTP40-M40-F | |
| 50 | 1½ | 47.9 | 40.4 | LTP50-M50-C | PG42 | 150 | (1½") | LTP50-M50-S | LTP50-M50-F | |
| 63 | 2 | 59.7 | 51.6 | LTP63-M63-C | PG48 | 200 | (2") | | | |

# When ordering PG or NPT please see below.

## Ordering Notes

- Add reel length eg: LTP20B-25M for a 25m reel
- For LTP specify colour (B = Black, G = Grey)

* Indicates parts made to order on request and may be subject to MOQ and lead time

\+ Double interlock section

- **Available on request:**
  - longer lengths and bulk packaging
  - cut lengths and assemblies
  - C-S with PG threads
  - other colours
  - internal thread fittings

## How to read the fittings code

**Note:** For PG or NPT thread types please insert thread size listed to obtain part number

**LTP10-M12-C** i.e **LTP16-PG13-C** or **LTP16-050-C**

conduit
thread size
fitting type

## properties

- High mechanical strength
- IP rating: IP66 + IP67 + IP68 (5 bar) + IP69
- Temperature range -50°C to +135°C
- Oil resistant
- UV resistant
- Nickel Plated Brass Fittings
- Earthing ferrule is manufactured in machined Nickel Plated Brass to facilitate easy assembly and re-use
- Stainless steel fittings also available
- Metric threads supplied with Insulated Throats
- PG and NPT threads supplied without Insulated Throats
- Swivel fittings allows the thread to swivel about the main body even after tightening
- Vibration and shock tested to EN61373 Cat 2
- Conforms to EN 61386
- Interchangeable with all Liquidtight conduits made to American (UL360) sizes.

### C90

**external thread nickel plated brass**

90° multipart compression fitting including elastomeric seal. Can be used for knockouts.

IP66 IP67 IP68 IP69

### C45

**external thread nickel plated brass**

45° multipart compression fitting including elastomeric seal. Can be used for knockouts.

IP66 IP67 IP68 IP69

### Coupler

**nickel plated brass**

Multi part compression coupler including elastomeric seals to connect with an external thread.

IP66 IP67 IP68 IP69

### FW

**fibre, retained face sealing washers**

Retained sealing washer to maintain IP rating of fitting to adjacent equipment.

IP66 IP67 IP68 IP69

### E

**insert nickel plated brass**

Single part, machined insert to cap end of conduit.











| metric thread part number | metric thread part number | part number | metric thread part number | part number | inside dia (mm) | outside dia (mm) | US trade size (") | nominal size (mm) |
|---|---|---|---|---|---|---|---|---|
| | | | | LTP10-E | 7.0 | 11.8 | ¼ | 10 |
| | | | | LTP10-E | | | | 10 |
| LTP12-M16-C90 | | | | LTP12-E | 10.0 | 14.2 | 5⁄16 | 12 |
| LTP16-M16-C90 | | | | LTP16-E | 12.6 | 17.8 | ⅜ | 16 |
| LTP16-M20-C90 | LTP16-M20-C45 | LTP16-LTP16 | FW16 | LTP16-E | | | | 16 |
| LTP20-M20-C90 | LTP20-M20-C45 | LTP20-LTP20 | FW20 | LTP20-E | 16.0 | 21.1 | ½ | 20 |
| LTP25-M25-C90 | LTP25-M25-C45 | LTP25-LTP25 | FW25 | LTP25-E | 21.0 | 26.4 | ¾ | 25 |
| LTP32-M32-C90 | LTP32-M32-C45 | LTP32-LTP32 | FW32 | LTP32-E | 26.5 | 33.1 | 1 | 32 |
| LTP40-M40-C90 | LTP40-M40-C45 | LTP40-LTP40 | FW40 | LTP40-E | 35.4 | 41.8 | 1¼ | 40 |
| LTP50-M50-C90 | LTP50-M50-C45 | | FW50 | LTP50-E | 40.4 | 47.9 | 1½ | 50 |
| LTP63-M63-C90 | LTP63-M63-C45 | | FW63 | LTP63-E | 51.6 | 59.7 | 2 | 63 |

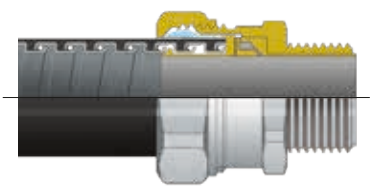
## Standards & Approvals

RoHS REACh

IRIS™ Certification ISO/TS 22163:2017

BS EN IEC 61386

## Technical Drawing





# **FB** system
galvanised steel core
galvanised steel overbraid

# **FUSSB** system
galvanised steel core
stainless steel overbraid

## Conduit

### FB

**Construction:** Galvanised steel, helically wound conduit with galvanised steel overbraid.

**Colour:** Zinc, self colour.

**Typical Applications:** Industrial environments and high temperatures.

EN 45545-2 HL3 NFPA 130

### FUSSB

**Construction:** Galvanised steel, helically wound, flexible conduit with stainless steel (316) overbraid.

**Typical Applications:** Underground stations where LFH properties and EMC screening are required.

EN 45545-2 HL3 NFPA 130

## Fittings

### M

**fixed external thread nickel plated brass**

Two part fitting comprising shell and body with external thread. This fitting can be inserted into a knockout and secured with a locknut.

IP40



### S

**swivel external thread nickel plated brass**

Two part fitting comprising shell and body. The external thread swivels about the main body. Can be used with threaded entries, or knockout secured with a locknut.

IP40



| nominal size (mm) | FB part number | FUSSB part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | M metric thread part number | M PG thread part number | S metric thread part number | S PG thread part number |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 | FB12 | FUSSB12* | 25 | 14.0 | 10.2 | 30 | FB12-M16-M | FB12-PG9-M | FB12-M16-S | FB12-PG9-S |
| 16 | FB16 | FUSSB16* | 25 | 17.5 | 13.0 | 40 | FB16-M16-M | FB16-PG11-M | FB16-M16-S | FB16-PG11-S |
| 16 | | | | | | | FB16-M20-M | | FB16-M20-S | |
| 20 | FB20 | FUSSB20 | 25 | 21.5 | 16.9 | 45 | FB20-M20-M | FB20-PG16-M | FB20-M20-S | FB20-PG16-S |
| 25 | FB25 | FUSSB25 | 25 | 26.0 | 21.1 | 55 | FB25-M25-M | FB25-PG21-M | FB25-M25-S | FB25-PG21-S |
| 32 | FB32 | FUSSB32 | 25 | 34.0 | 28.1 | 70 | FB32-M32-M | FB32-PG29-M | FB32-M32-S | FB32-PG29-S |
| 40 | FB40 | FUSSB40* | 10 | 43.5 | 37.6 | 80 | FB40-M40-M | FB40-PG36-M | FB40-M40-S | FB40-PG36-S |
| 50 | FB50 | FUSSB50* | 10 | 54.5 | 48.4 | 90 | FB50-M50-M | FB50-PG48-M | FB50-M50-S | FB50-PG42-S |

## Ordering Notes

- Add reel length eg: FB20-25M for 25m reel

* Indicates parts made to order on request and may be subject to MOQ and lead time

- **Available on request:**
  - longer lengths, cut lengths and assemblies
  - additional sizes, stainless steel overbraided
  - PG threads, female threaded fittings
  - full copies of independent test report confirming screening effectiveness

## How to read the fittings code

FB20-M20-M

- FB20 — conduit
- M20 — thread size
- M — fitting type

## Standards & Approvals

RoHS ✓ REACh ✓

BS EN IEC 61386 CE UNDERGROUND

IRIS Certification ISO/TS 22163:2017

## properties

- High mechanical strength
- Highly flexible
- IP rating: IP40
- High abrasion resistance
- Resists hot metal swarf and splashes
- Provides EMC screening
  **55dB@1MHz (FB)**
  **49dB@1MHz (FUSSB)**
- Temperature range -100˚C to +300˚C
- Inherently Low Fire Hazard (LFH)
  see page 8
- Fully compliant to LUL Std S1085.
  (Cert No. 296)
- Nickel plated brass fittings
- EN45545-2 to HL3 and
  NFPA130



## P

**plain hole connector nickel plated brass**

Two part fitting comprising shell and body without thread. The body is fitted through the opposite side of the entry to the conduit and acts as a locking device also providing a smooth entry bush.

IP40



## 90° elbow

**internal and external threaded nickel plated brass elbow**

90° elbow which can be screwed onto external threaded fittings.



## C

**fixed external thread nickel plated brass**

Multipart compression fitting including elastomeric seal. Can be used for knockouts. Braid is locked between inner and outer compression nuts.

IP40



## CS

**swivel external thread nickel plated brass**

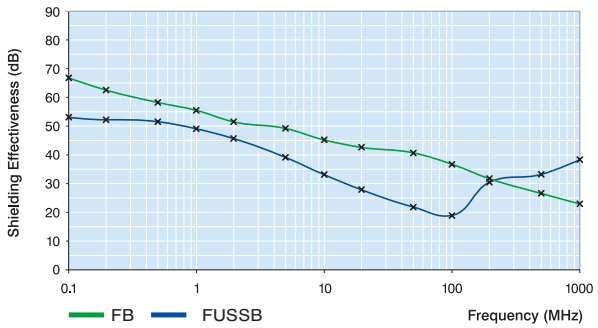
Multipart compression fitting including elastomeric seal can be used for knockouts or threaded entries. Braid is locked between inner and outer compression nuts.

IP40

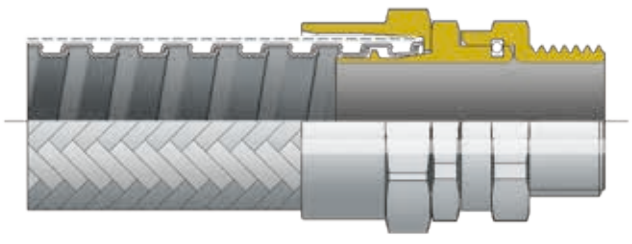


| hole size (mm) | part number | metric thread part number | metric thread part number | PG thread part number | metric thread part number | nominal size (mm) |
|---|---|---|---|---|---|---|
| 12 | **FB12-P** | **BM90-16M** | | | | **12** |
| 16 | **FB16-P** | **BM90-16M** | **FSB16-M16-C** | **FSB16-PG11-C** | **FSB16-M16-C-S** | **16** |
| | | **BM90-20M** | **FSB16-M20-C** | **FSB16-PG13-C** | **FSB16-M20-C-S** | **16** |
| 20 | **FB20-P** | **BM90-20M** | **FSB20-M20-C** | **FSB20-PG16-C** | **FSB20-M20-C-S** | **20** |
| 25 | **FB25-P** | **BM90-25M** | **FSB25-M25-C** | **FSB25-PG21-C** | **FSB25-M25-C-S** | **25** |
| 32 | **FB32-P** | **BM90-32M** | **FSB32-M32-C** | **FSB32-PG29-C** | **FSB32-M32-C-S** | **32** |
| 40 | **FB40-P** | **BM90-40M** | | | | **40** |
| 51 | **FB50-P** | **BM90-50M** | | | | **50** |

## EMC Screening Performance




## Technical Drawing





# **LFHUBRD system** galvanised steel core, extra LFH coated, stainless steel overbraid

## Conduit

### LFHUBRD



**Construction:** Galvanised steel, helically wound, flexible conduit with extra LFH coating and stainless steel (316) overbraid.

**Typical Applications:** Metro rail stations where LFH, EMC screening and anti-vandal properties are required. Compliant to LUL Std S1085 (Cert No.297).

EN 45545-2 HL3 NFPA 130

## Fittings

### M

**fixed external thread nickel plated brass**

Two part fitting comprising shell and body with external thread. This fitting can be inserted into a knockout and secured with a locknut.

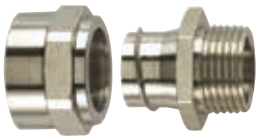
IP54

### S

**swivel external thread nickel plated brass**

Two part fitting comprising shell and body. The external thread swivels about the main body. Can be used with threaded entries, or knockout secured with a locknut.

IP54





| nominal size (mm) | LFHUBRD part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | M metric thread part number | M PG thread part number | S metric thread part number | S PG thread part number |
|---|---|---|---|---|---|---|---|---|---|
| 20 | LFHUBRD20 | 25 | 22.7 | 16.9 | 45 | FSB20-M20-M | FSB20-PG16-M | FSB20-M20-S | FSB20-PG16-S |
| 25 | LFHUBRD25 | 25 | 27.2 | 21.1 | 55 | FSB25-M25-M | FSB25-PG21-M | FSB25-M25-S | FSB25-PG21-S |
| 32 | LFHUBRD32 | 25 | 35.2 | 28.1 | 70 | FSB32-M32-M | FSB32-PG29-M | FSB32-M32-S | FSB32-PG29-S |
| 40 | LFHUBRD40 | 10 | 45.7 | 37.6 | 80 | FSB40-M40-M | FSB40-PG36-M | FSB40-M40-S | FSB40-PG36-S |
| 50 | LFHUBRD50* | 10 | 57.7 | 48.4 | 90 | FSB50-M50-M | FSB50-PG48-M | FSB50-M50-S | FSB50-PG42-S |

* Indicates parts made to order on request and maybe subect to MOQ and lead time.

## Ordering Notes

- Add reel length eg: LFHUBRD20-25M for 25m reel
- **Available on request:**
  - longer lengths, cut lengths and assemblies
  - additional sizes, stainless steel overbraided
  - PG threads, female threaded fittings
  - full copies of independent test report confirming screening effectiveness

## How to read the fittings code

FSB20-M20-M

- conduit
- thread size
- fitting type

## Standards

BS EN IEC 61386

Note: refer to conduit properties for applicable standards

## properties

- High mechanical strength
- Tensile strength **with standard fittings 120kg for 20mm size**
- Tensile strength **with C type fittings 300kg for 20mm size**
- Highly flexible
- IP rating: **IP54 for standard fittings, IP65 for C type fittings**
- High abrasion resistance
- Resists hot metal swarf and splashes
- Provides EMC screening
- Temperature range **-20˚C to +90˚C (LFHUBRD)**
- **LFHUBRD is extra low fire hazard**
- **Compliant to LUL Std S1085 (LFHUBRD) (Cert No. 297)**
- Nickel plated brass fittings
- Vibration and shock tested to EN61373 Cat 2
- LFHUBRD is EN45545-2 to HL3 and NFPA130



### P

**plain hole connector nickel plated brass**

Two part fitting comprising shell and body without thread. The body is fitted through the opposite side of the entry to the conduit and acts as a locking device also providing a smooth entry bush.

IP54

### C

**fixed external thread nickel plated brass**

Multipart compression fitting including elastomeric seal. Can be used for knockouts. Braid is locked between inner and outer compression nuts.

IP65

### CS

**swivel external thread nickel plated brass**

Multipart compression fitting including elastomeric seal can be used for knockouts or threaded entries. Braid is locked between inner and outer compression nuts.

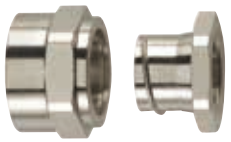
IP65

### C90

**external thread elbow nickel plated brass**

Multipart 90˚ compression fitting including elastomeric seal. Braid is locked between inner and outer compression nuts.

IP65



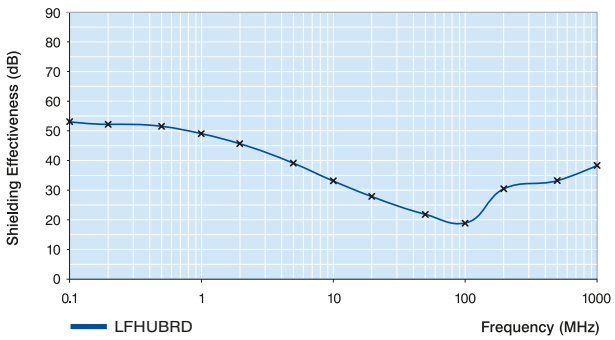




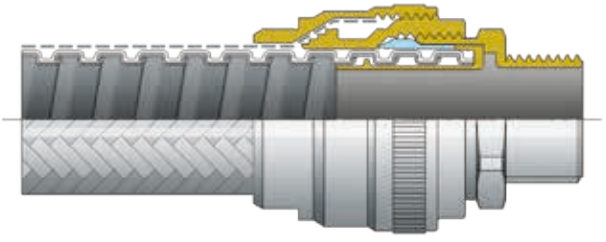


| hole size (mm) | part number | metric thread part number | PG thread part number | metric thread part number | metric thread part number | nominal size (mm) |
|---|---|---|---|---|---|---|
| 20 | **FSB20-P** | **FSB20-M20-C** | **FSB20-PG16-C** | **FSB20-M20-C-S** | **FSB20-M20-C90** | 20 |
| 25 | **FSB25-P** | **FSB25-M25-C** | **FSB25-PG21-C** | **FSB25-M25-C-S** | **FSB25-M25-C90** | 25 |
| 32 | **FSB32-P** | **FSB32-M32-C** | **FSB32-PG29-C** | **FSB32-M32-C-S** | **FSB32-M32-C90** | 32 |
| 40 | **FSB40-P** | | | | | 40 |
| 50 | **FSB50-P** | | | | | 50 |

## EMC Screening Performance




## Technical Drawing





# FSS system
stainless steel corrugated conduit

# FSSBRD system
stainless steel corrugated conduit with overbraid

## Conduit

### FSS

**Construction:** Stainless steel (316L) annularly corrugated conduit. Inherent Low Fire hazard performance with superior Ingress Protection (IP68) and excellent corrosion resistance.

**Typical Applications:** Metro rail stations and tunnels.

**Colour:** Self colour, also available in Black* version on request

- IP rating: IP68
- Temperature range -100°C to +400°C
- High Mechanical Strength
- Pull off strength: 100kg (20mm)
- High compression strength 1000kg/100mm
- Inherent low fire hazard
- Compliant to LUL Std S1085 (Pending)
- EN 45545-2 to HL3 and NPFA 130 compliant
- Excellent Corrosion resistance
- Oil resistant
- UV resistant
- Provides EMC screening
- Offers Antistatic properties

IP68

EN 45545-2 HL3 NFPA 130

### FSSBRD

**Construction:** Stainless steel (316L) annually corrugated conduit with stainless steel (316L) overbraid.

**Typical Applications:** Inherent Low Fire hazard performance with superior Ingress Protection (IP68), excellent corrosion resistance and enhanced EMC performance together with abrasion resistance. Metro rail stations and tunnels.

**Colour:** Self colour

- IP rating: IP68
- Temperature range -100°C to +400°C
- High Mechanical Strength
- High Abrasion resistance
- Pull off strength: 150kg (20mm)
- High compression strength 1000kg/100mm
- Inherent low fire hazard
- Compliant to LUL Std S1085 (Pending)
- EN 45545-2 to HL3 and NPFA 130 compliant
- Excellent Corrosion resistance
- Oil resistant
- UV resistant
- Provides EMC screening – Standard
- Offers Antistatic properties

IP68

EN 45545-2 HL3 NFPA 130

## Fittings

### C

**fixed external thread nickel plated brass**

Multipart compression fitting including conduit retention clip and polyester seal. Can be used with knockouts.

For BRD version, Braid is locked between inner and outer compression nuts.

**Colour:** Self colour or also available in Black for FSS version.

IP68



### S-F

**swivel internal thread nickel plated brass**

Multipart compression fitting including conduit retention clip and polyester seal. Swivel internal thread allows connection to external thread.

**Colour:** Self colour or also available in Black for FSS version.

IP68



| nominal size (mm) | FSS part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | FSSBRD part number | reel length (m) | outside dia (mm) | inside dia (mm) | min inside bend radius (mm) | for use with FSS | for use with FSSBRD | for use with FSS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | FSS20 | 25 | 21.6 | 16.2 | 45 | FSSBRD20 | 25 | 21.6 | 16.2 | 60 | FSS20-M20-C | FSSBRD20-M20-C | FSS20-FM20-S |
| 25 | FSS25 | 25 | 26.8 | 20.2 | 55 | FSSBRD25 | 25 | 28.3 | 20.2 | 70 | FSS25-M25-C | FSSBRD25-M25-C | FSS25-FM25-S |
| 32 | FSS32* | 25 | 32.5 | 25.4 | 65 | FSSBRD32 | 25 | 33.8 | 25.4 | 80 | FSS32-M32-C | FSSBRD32-M32-C | FSS32-FM32-S* |
| 40 | FSS40* | 10 | 41.3 | 34.1 | 105 | FSSBRD40* | 10 | 43.0 | 34.1 | 120 | FSS40-M40-C* | FSSBRD40-M40-C* | FSS40-FM40-S* |
| 50 | FSS50 | 10 | 50.0 | 40.0 | 130 | FSSBRD50 | 10 | 51.2 | 40.0 | 145 | FSS50-M50-C | FSSBRD50-M50-C | FSS50-FM50-S* |

## Ordering Notes

* Indicates parts made to order on request and may be subject to MOQ and leadtime.

## Standards

EN 45545-2 HL3 NFPA 130 RoHS UNDERGROUND CE REACh

## properties

- IP rating: IP68
- Temperature range -50°C to +135°C
- Inherently Low Fire Hazard
- Suitable for knockout or threaded entries
- Nickel Plated Brass Fittings
- Conduit throat supplied with fitting to protect cables from cut end of conduit
- High mechanical strength
- Tensile strength with standard fittings 100kg for 20mm size
- Tensile strength with BRD C type fittings 150kg for 20mm size
- BRD type fittings: Braid is locked between inner and outer compression nuts
- Also available in chemically blackened version for FSS



## C-S NEW

**swivel external thread nickel plated brass**

Multipart compression fitting including conduit retention clip and polyester seal. Swivel external thread means it can be used for knockouts and / or threaded entries.

For BRD version, Braid is locked between inner and outer compression nuts.

**Colour:** Self colour or also available in Black for FSS version.

IP68



## C90 NEW

**external thread nickel plated brass**

90˚ multipart compression fitting including elastomeric seal. Can be used for knockouts.

IP68



## C45 NEW

**external thread nickel plated brass**

45˚ multipart compression fitting including elastomeric seal. Can be used for knockouts.

IP68



## FCC-SS CLIPS

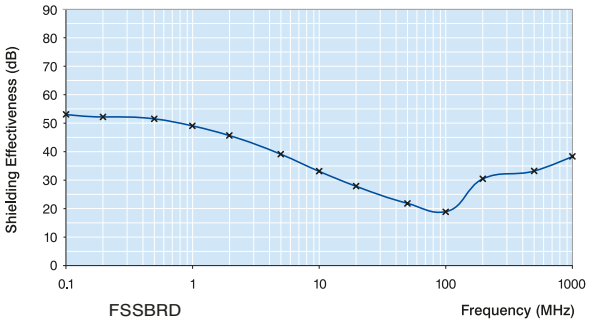
**stainless steel (316L) P clips**

P clip to support conduit.

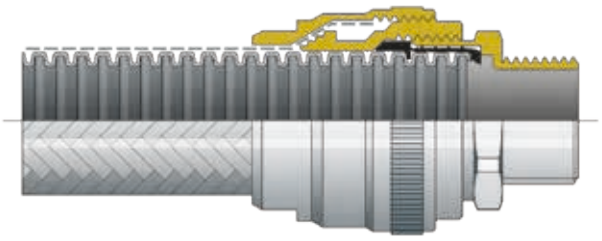


| for use with FSS | for use with FSSBRD | for use with FSS | for use with FSS | | nominal size (mm) |
|---|---|---|---|---|---|
| FSS20-M20-S | FSSBRD20-M20-S | FSS20-M20-C90 | FSS20-M20-C45 | FCC20-SS | 20 |
| FSS25-M25-S | FSSBRD25-M25-S | FSS25-M25-C90 | FSS25-M25-C45 | FCC25-SS | 25 |
| FSS32-M32-S | FSSBRD32-M32-S* | FSS32-M32-C90 | FSS32-M32-C45 | FCC32-SS | 32 |
| FSS40-M40-S* | FSSBRD40-M40-S* | FSS40-M40-C90* | FSS40-M40-C45* | FCC40-SS | 40 |
| FSS50-M50-S | FSSBRD50-M50-S | FSS50-M50-C90 | FSS50-M50-C45 | FCC50-SS | 50 |

## EMC Screening Performance




## Technical Drawing



# Cable Gland Fittings

## cable strain relief and enhanced IP rating for Flexicon conduits

For applications that require the conduit system to provide strain relief and enhanced IP rating to the cables being mechanically protected eg. rail market or heavy machinery construction sector.

**properties**

- Combined properties of conduit fitting and cable gland
- Cable strain relief
- Additional IP rating on cable inside conduit*
- Nickel plated brass fittings
- Cable gland properties: IP68 (10 bar) + IP69
- Temperature range
  -40˚C to +100˚C for static applications
  -20˚C to +100˚C for dynamic applications
- EMC cable gland version on request

| Suitable for the following conduits | Conduit | Fitting | nominal size (mm) | Part Number | IP rating of conduit system | IP rating of cable gland | Clamping range of cable gland |
|---|---|---|---|---|---|---|---|
| **FU & SSU** |  |  | **16** | **FSU16-M16-CG** | IP40 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **FSU20-M20-CG** | | | 7-13mm |
| | | | **25** | **FSU25-M25-CG** | | | 9-17mm |
| | | | **32** | **FSU32-M32-CG** | | | 11-21mm |
| **FSU, FNU, LFHU and FPU** |  |  | **16** | **FSU16-M16-CG** | IP65 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **FSU20-M20-CG** | | | 7-13mm |
| | | | **25** | **FSU25-M25-CG** | | | 9-17mm |
| | | | **32** | **FSU32-M32-CG** | | | 11-21mm |
| **LTP, LTPHC, LTPUL, LTPAS, LTPSS, LTPLFH LTBRDP, LTBRDLFH, LTPPU and LTPPUAS** |  |  | **16** | **LTP16-M16-CG** | IP66+IP67+ IP68 (5 bar)+IP69 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **LTP20-M20-CG** | | | 7-13mm |
| | | | **25** | **LTP25-M25-CG** | | | 9-17mm |
| | | | **32** | **LTP32-M32-CG** | | | 11-21mm |
| **FB & FUSSB** |  |  | **16** | **FSB16-M16-CG** | IP40 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **FSB20-M20-CG** | | | 7-13mm |
| | | | **25** | **FSB25-M25-CG** | | | 9-17mm |
| | | | **32** | **FSB32-M32-CG** | | | 11-21mm |
| **FSB & LFHUBRD** |  |  | **16** | **FSB16-M16-CG** | IP65 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **FSB20-M20-CG** | | | 7-13mm |
| | | | **25** | **FSB25-M25-CG** | | | 9-17mm |
| | | | **32** | **FSB32-M32-CG** | | | 11-21mm |
| **LTPBRD** |  |  | **16** | **LTPB16-M16-CG** | IP66+IP67+ IP68 (5 bar)+IP69 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **LTPB20-M20-CG** | | | 7-13mm |
| | | | **25** | **LTPB25-M25-CG** | | | 9-17mm |
| | | | **32** | **LTPB32-M32-CG** | | | 11-21mm |
| **LPC, LPCG, LPCO, LPCBU** |  |  | **16** | **LPC16-M16-CG** | IP66+IP67+ IP68 (5 bar)+IP69 | IP68 (10 bar)+IP69 | 4.5-10mm |
| | | | **20** | **LPC20-M20-CG** | | | 7-13mm |
| | | | **25** | **LPC25-M25-CG** | | | 9-17mm |
| | | | **32** | **LPC32-M32-CG** | | | 11-21mm |

*IP rating up to IP68 (10 bar), IP69 dependent on cable used

## Standards

BS EN IEC 61386

CE

REACh ✓ RoHS ✓



# **Round Connection** boxes
stainless steel
nickel plated brass

IP66 IP67 IP68 IP69

NEW



# Connection Boxes

## ROUND BOX - STAINLESS STEEL

NEW HG HYGIENIC RANGE

IP66 IP67 IP68 IP69



**Construction:** Stainless Steel (Grade 316) Round box consisting of a base and lid. Designed using the principles of EN 1672-2 and EN ISO 14159 supplied with blue high visibility polyester elastomer lid and base seals. Available with either 2 or 4 holes, other versions available on request. 2 Fixing holes are provided, together with component Mounting holes to help with installation. Slots in the lid allow for secure tightening of the lid and aids opening for maintenance or upgrade. Design offers high Ingress Protection combined with high corrosion resistance.



**Typical Applications:** Ideal use as a Junction Box for the interconnection of circuits. The lid and base construction provides access to cabling routed through connecting conduits. Fixing holes are provided in the base and pre drilled Mounting holes provide easy option to fix terminals or DIN rail within the box. Ideal for extending or modifying circuits whilst maintaining system integrity. When used with Flexicon Short Thread fittings the box provides a reliable interface with Flexible conduit whilst maximising the available wiring space within the box. Blanking Plugs can be used to seal off any unused ways. The Box offers the possibility to connect and interface with Cable Glands or different types of cabling installations.

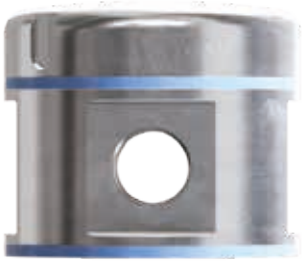
4 Way Box shown
2 mounting holes on base
M20 Thread Entries

| | Part Number | Height (mm) | Diameter (mm) |
|---|---|---|---|
| 2 Way | FBOX75X60-M20X2-SS | 65 | 75 |
| 4 Way | FBOX75X60-M20X4-SS | 65 | 75 |

## ROUND BOX - NICKEL PLATED BRASS

NEW

IP66 IP67 IP68 IP69



**Construction:** Nickel Plated Brass Round box consisting of a base and lid. Supplied with blue high visibility polyester elastomer lid and base seals. Available with either 2 or 4 holes, other versions available on request. 2 Fixing holes are provided, together with component Mounting holes to help with installation. Slots in the lid allow for secure tightening of the lid and aids opening for maintenance or upgrade. Design offers high Ingress Protection.

**Typical Applications:** Ideal use as a Junction Box for the interconnection of circuits for general purpose Applications. The lid and base construction provides access to cabling routed through connecting conduits. Fixing holes are provided in the base and pre drilled Mounting holes provide easy option to fix terminals or DIN rail within the box. Ideal for extending or modifying circuits whilst maintaining system integrity. When used with Flexicon Short Thread fittings the box provides a reliable interface with Flexible conduit whilst maximising the available wiring space within the box. Blanking Plugs can be used to seal off any unused ways. The Box offers the possibility to connect and interface with Cable Glands or different types of cabling installations.

2 Way Box shown
2 mounting holes on base
M20 Thread Entries

| | Part Number | Height (mm) | Diameter (mm) |
|---|---|---|---|
| 2 Way | FBOX75X60-M20X2-NPB | 65 | 75 |
| 4 Way | FBOX75X60-M20X4-NPB | 65 | 75 |

For non-metallic Round Connection Boxes see page 63



# Accessories

## metric locknuts

nickel plated brass, plated steel, stainless steel, nylon black or grey



| nickel plated brass part number | nickel plated EMC part number | plated steel part number | stainless steel part number | nylon part number |
|---|---|---|---|---|
| B-M12 | | | | LM12-N# |
| B-M16 | | S-M16 | SS-M16 | LM16-N# |
| B-M20 | B-M20-EMC | S-M20 | SS-M20 | LM20-N# |
| B-M25 | B-M25-EMC | S-M25 | SS-M25 | LM25-N# |
| B-M32 | B-M32-EMC | S-M32 | SS-M32 | LM32-N# |
| B-M40 | B-M40-EMC | S-M40 | SS-M40 | LM40-N# |
| B-M50 | | S-M50 | SS-M50 | LM50-N# |
| B-M63 | | S-M63 | SS-M63* | LM63-N# |
| B-M75 | | | | |

## PG locknuts

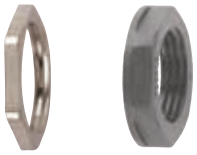
nickel plated brass, Zinc, nylon black or grey



| nickel plated brass part number | nylon part number |
|---|---|
| B-PG7 | PG7-N# |
| B-PG9 | PG9-N# |
| B-PG11 | PG11-N# |
| B-PG13 | PG13-N# |
| B-PG16 | PG16-N# |
| B-PG21 | PG21-N# |
| B-PG29 | PG29-N# |
| B-PG36 | PG36-N# |
| B-PG42 | PG42-N# |
| B-PG48 | PG48-N# |

## NPT locknuts

Zinc or nylon (black)



| zinc part number | nylon part number |
|---|---|
| Z-050 | 050-NB |
| Z-075 | 075-NB |
| Z-100 | 100-NB |
| Z-125 | |
| Z-150 | |
| Z-200 | |

## stop plug

nylon metric black — nylon PG (grey)



| metric part number | PG part number |
|---|---|
| SP-M12* | SP-PG7* |
| SP-M16 | SP-PG9 |
| SP-M20 | SP-PG11 |
| SP-M25 | SP-PG13 |
| SP-M32 | SP-PG16 |
| SP-M40* | SP-PG21 |
| | SP-PG29 |

# add B or G to specify colour. eg. LM20-NB for Black

## sealing washers

Polyester Elastomer, Neoprene and fibre face sealing washers



| Polyester Elastomer Metric — metric thread part number | Neoprene Metric — metric thread part number | Neoprene PG — PG thread part number | Neoprene PG — NPT thread part number | Fibre Metric — metric thread part number | Fibre PG — PG thread part number |
|---|---|---|---|---|---|
| | SW12 | SWPG7 | | FW12 | FWPG7 |
| RSW16 | SW16 | SWPG9 | | FW16 | FWPG9 |
| RSW20 | SW20 | SWPG11 | SW050 | FW20 | FWPG11 |
| RSW25 | SW25 | SWPG13 | SW075 | FW25 | FWPG13 |
| RSW32 | SW32 | SWPG16 | SW100 | FW32 | FWPG16 |
| RSW40 | SW40 | SWPG21 | SW125 | FW40 | FWPG21 |
| RSW50 | SW50 | SWPG29 | SW150 | FW50 | FWPG29 |
| RSW63 | SW63 | SWPG36 | SW200 | FW63 | FWPG36 |
| | | SWPG42 | | | |
| | | SWPG48 | | | FWPG48 |

## earthing washers

shake proof washer — earth tag washer



| shake proof washer — metric thread part number | earth tag washer — metric thread part number |
|---|---|
| | |
| SPW16 | |
| SPW20 | ET-M20 |
| SPW25 | ET-M25 |
| SPW32 | |

## fixing clips

**plated steel with black pvc liner or stainless steel.**

**LFH liner available on request**



## conduit clip

**nylon conduit clip with integral lid - black or grey**



## FCLAMP

**non-metallic, heavy duty conduit clamp**

Nylon PA66, Nylon conduit fixing clamp for corrugated conduit.



## EC

**end cap**

Nylon PA66 end cap to snap over end of conduit and provide a smooth entry bush to prevent snagging and sharp edges, and provide a neat finish when no connectors are used.



## REC

**rubber end cap**

Thermoplastic elastomer cap used to seal end of conduit. Can be cut to size depending on size of cable. Can be additionally secured using cable tie (not supplied).



(For fixing rails & accessories contact Flexicon)

| to fit conduit size | part number | part number |
|---|---|---|
| 10 | FCC10 | FCC10-SS* |
| 12 | FCC12 | FCC12-SS |
| 16 | FCC16 | FCC16-SS |
| 20 | FCC20 | FCC20-SS |
| 25 | FCC25 | FCC25-SS |
| 32 | FCC32 | FCC32-SS |
| 40 | FCC40 | FCC40-SS |
| 50 | FCC50 | FCC50-SS |
| 63 | FCC63 | FCC63-SS* |
| 75 | FCC75 | |
| 80 | FCC80 | |
| 106 | FCC106 | |

| to fit nominal conduit sizes | conduit clip for corrugated | conduit clip for plain or rigid | fclamp | end cap | part number | to fit conduit size | outlet ID mm |
|---|---|---|---|---|---|---|---|
| 10 | FCL10 | | | | REC10 | 10 | 0-7 |
| 13 | FCL13 | | | | REC13 | 13 | 0-7 |
| 16 | FCL16 | FCL16B-P | FCLAMP- 3-16 | EC16B | REC16 | 16 | 0-11 |
| 18 | FCL18 | FCL18B-P | | | | | |
| 20 | FCL20 | FCL20B-P | | | | | |
| 21 | FCL21 | FCL21B-P | FCLAMP- 3-21 | EC21B | REC21 | 21 | 0-15 |
| 25 | FCL25 | FCL25B-P | | | | | |
| 28 | FCL28 | | FCLAMP- 4-28 | EC28B | REC28 | 28 | 0-21 |
| 32 | FCL32 | | | | | | |
| 34 | FCL34 | FCL33B-P | FCLAMP- 5-34 | EC34B | REC34 | 34 | 0-25 |
| 42 | FCL42 | | FCLAMP- 6-42 | EC42B | REC42 | 42 | 0-34 |
| 54 | FCL54 | | FCLAMP- 7-54 | EC54B | REC54 | 54 | 0-46 |
| 67 | | | FCLAMP- 7-67 | | REC67 | 67 | 0-52 |
| 80 | | | FCLAMP- 8-80 | | REC80 | 80 | 0-62 |

* indicates parts made to order on request and may be subject to MOQ and lead time

## cable glands

Our range of Cable glands provides an easy to assemble, fast fit, liquid tight solution for multipurpose applications.
Available in nickel plated brass they have been designed to provide the highest degree of functionality and safety.



| Thread Size. | Nickel plated brass | Thread Length (mm) | Cable Dia (min) (mm) | Cable Dia (max) (mm) | Spanner Size (mm) | Pack Quantity |
|---|---|---|---|---|---|---|
| M16 | B-M16-CG | 12 | 4.5 | 10 | 20 | 10 |
| M20 | B-M20-CG | 12 | 7 | 13 | 24 | 10 |
| M25 | B-M25-CG | 12 | 9 | 17 | 29 | 10 |
| M32 | B-M32-CG | 15 | 11 | 21 | 36 | 2 |
| M40 | B-M40-CG | 15 | 19 | 28 | 45 | 2 |
| M50 | B-M50-CG | 15 | 27 | 35 | 54 | 1 |
| M63 | B-M63-CG | 15 | 35 | 47 | 67 | 1 |

### Technical Details

- Material: Nickel plated brass
- IP Rating: IP68 (10 bar) + IP69
- Produced and tested in accordance with EN 50262:1999
- Temperature range:
  -40˚C to +100˚C (static)
  -20˚C to +100˚C (dynamic)
- UL Listed



| Thread Size. | EMC Nickel plated brass | Thread Length (mm) | Cable Dia (min) (mm) | Cable Dia (max) (mm) | Spanner Size (mm) | Pack Quantity |
|---|---|---|---|---|---|---|
| M16 | B-M16-CG-EMC | 12 | 4.5 | 9 | 20 | 10 |
| M20 | B-M20-CG-EMC | 12 | 7 | 12.5 | 24 | 10 |
| M25 | B-M25-CG-EMC | 12 | 9 | 16.5 | 29 | 10 |
| M32 | B-M32-CG-EMC | 15 | 11 | 21 | 36 | 2 |
| M40 | B-M40-CG-EMC | 15 | 19 | 28 | 45 | 2 |
| M50 | B-M50-CG-EMC | 15 | 27 | 35 | 54 | 1 |

### Technical Details

- Material: EMC Nickel plated brass
- IP Rating: IP68 (10 bar)
- Produced and tested in accordance with EN 50262:1999
- Temperature range:
  -40˚C to +100˚C (static)
  -20˚C to +100˚C (dynamic)
- UL Listed

# Technical Data - Resistance to Chemicals

| 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%) | HYDROGEN PEROXIDE (30%) | HYDROGEN PEROXIDE (60%) | LACTIC ACID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | **FPAS** | nylon LFH PA6 corrugated, std weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 30 | **FPAH** | nylon LFH PA6 corrugated, heavy weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 30 | **FPASC** | nylon LFH PA6 corrugated, std weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 30 | **FPR** | nylon extra LFH PA6 corrugated, std weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 31 | **FPADS** | nylon PA6 double slit corrugated | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 31 | **FPI** | nylon PA12 corrugated, standard weight | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 31 | **FPIH** | nylon PA12 corrugated, heavy weight | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 31 | **FPIHR** | nylon PA12 corrugated, heavy weight | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 52 | **FPRSS** | PA6 corrugated, SS316 overbraid | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 52 | **FPRTC** | PA6 corrugated, tinned copper overbraid | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | X | X | X |
| 52 | **FPISS** | PA12 corrugated, SS316 overbraid | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 52 | **FPIHSS** | PA12 corrugated, SS316 overbraid | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 52 | **FPIHRSS** | PA12 corrugated, SS316 overbraid | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 56 | **NRFPAS** | nylon LFH PA6 corrugated, std weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 56 | **NRFPAH** | nylon LFH PA6 corrugated, heavy weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 56 | **NRFPR** | nylon extra LFH PA6 corrugated, std weight | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |
| 57 | **NRFPIH** | nylon PA12 corrugated, heavy weight | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 57 | **NRFPIHR** | nylon PA12 corrugated, heavy weight | ✓ | ✓ | ✓ | L | ✓ | L | ✓ | ✓ | X | ✓ | L | X | ✓ | L | L | ✓ | L | ✓ | ✓ | X | X | X | X | L |
| 57 | **NRFPADS** | nylon PA6 double slit corrugated | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | X | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | L |

**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.

NEW



| 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 | ✓ | ✓ | ✗ | **FPAS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPAH** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPASC** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPR** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPADS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPI** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPIH** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPIHR** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | L | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPRSS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | L | ✓ | ✗ | L | ✓ | ✓ | ✗ | **FPRTC** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | L | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPISS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | L | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPIHSS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | L | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **FPIHRSS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **NRFPAS** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **NRFPAH** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **NRFPR** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **NRFPIH** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | L | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | L | ✓ | ✓ | ✗ | **NRFPIHR** |
| ✓ | L | ✗ | ✓ | ✗ | ✗ | L | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | L | ✓ | ✓ | L | ✓ | ✓ | ✗ | **NRFPADS** |

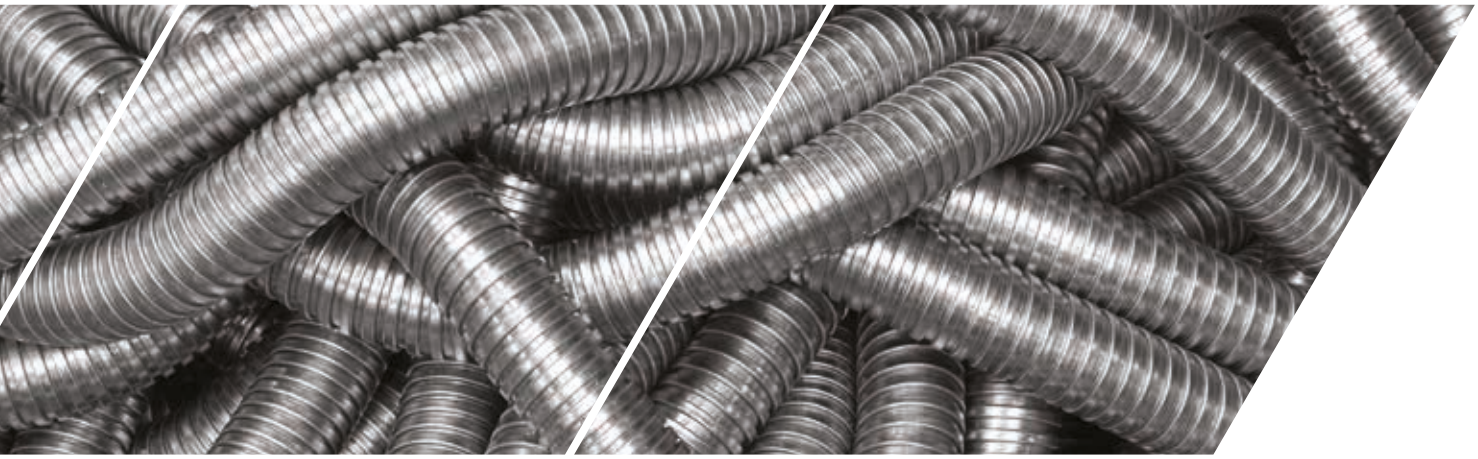
The chart above is based on exposure to single chemicals at room temperature and should be used as a selection guide. For additional chemicals, higher concentrations, elevated temperatures or combinations of chemicals, please call +44 (0)1675 466900 for technical advice.

# Technical Data - Resistance to Chemicals

| 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%) | HYDROGEN PEROXIDE (30%) | HYDROGEN PEROXIDE (60%) | LACTIC ACID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68 | FU | galvanised steel | ✓ | ✓ | ✓ | X | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | X | X | X | X |
| 68 | SSU | stainless steel, grade 316 | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | ✓ | ✓ | ✓ |
| 70 | FSU | galvanised steel, pvc coated | X | X | X | L | X | X | X | X | X | ✓ | ✓ | L | L | X | X | X | X | L | L | ✓ | X | ✓ | ✓ | L |
| 70 | LFHU | galvanised steel, LFH coated | L | L | L | ✓ | X | X | X | X | X | ✓ | ✓ | X | X | ✓ | X | X | X | ✓ | X | X | X | X | X | X | ✓ |
| 70 | FPU | galvanised steel, polyurethane coated | ✓ | ✓ | ✓ | X | L | L | L | L | X | ✓ | ✓ | X | ✓ | L | ✓ | L | X | ✓ | X | X | X | L | X | L |
| 72 | 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 | L | X | L |
| 72 | LTPHC | galv steel, thermoplastic rubber, liquid tight | ✓ | L | L | ✓ | ✓ | X | X | L | L | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | L | ✓ | X | ✓ | ✓ | L | X | L |
| 72 | LTPLFH | galv steel, LFH coated, liquid tight | ✓ | ✓ | ✓ | ✓ | X | X | X | L | X | ✓ | ✓ | L | L | L | X | L | L | L | L | L | X | L | X | L |
| 73 | LTBRDP | galv steel, braided core, pvc coated, liquid tight | ✓ | ✓ | ✓ | ✓ | X | X | X | L | X | ✓ | ✓ | L | L | L | X | L | L | L | L | L | X | L | X | L |
| 73 | LTPPU | galv steel, polyurethane coated, liquid tight | ✓ | ✓ | ✓ | X | L | L | L | L | X | ✓ | ✓ | X | ✓ | L | ✓ | X | ✓ | X | X | X | L | X | X | L |
| 73 | 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 | X | X | X | ✓ |
| 76 | FB | galvanised steel, galv steel overbraid | ✓ | ✓ | ✓ | X | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | X | X | X | X |
| 76 | FUSSB | galvanised steel, SS316 overbraid | ✓ | ✓ | ✓ | X | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | X | X | X | X | X | X |
| 78 | LFHUBRD | galv steel, LFH coated, SS316 overbraid | L | L | L | ✓ | X | X | X | X | X | ✓ | ✓ | X | X | ✓ | X | X | X | ✓ | X | X | X | X | X | X | ✓ |
| 80 | FSS | stainless steel corrugated | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | ✓ | ✓ | ✓ |
| 80 | FSSBRD | stainless steel corrugated, overbraid | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X | ✓ | ✓ | ✓ |

**key**

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



# Metallic conduit and fittings

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

NEW



| 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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | ✓ | ✓ | ✓ | X | X | X | X | ✓ | ✓ | ✓ | X | X | ✓ | X | X | X | X | X | ✓ | ✓ | X | X | ✓ | ✓ | X | X | ✓ | X | **FU** |
| ✓ | ✓ | ✓ | ✓ | X | X | ✓ | ✓ | ✓ | ✓ | ✓ | SS | ✓ | ✓ | SS | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **SSU** |
| L | X | X | X | ✓ | ✓ | X | L | L | X | X | X | ✓ | X | X | ✓ | L | X | X | X | L | X | X | L | L | X | ✓ | L | ✓ | **FSU** |
| L | X | X | X | ✓ | X | ✓ | ✓ | X | X | X | X | ✓ | X | ✓ | ✓ | ✓ | X | X | L | L | L | L | X | L | X | ✓ | X | ✓ | **LFHU** |
| L | L | X | L | X | X | L | L | L | ✓ | X | X | L | X | ✓ | L | X | L | L | X | L | X | X | X | ✓ | X | ✓ | L | L | **FPU** |
| ✓ | X | X | L | L | X | ✓ | L | X | L | L | SS | ✓ | X | SS | ✓ | ✓ | X | SS | X | L | X | X | L | ✓ | X | ✓ | L | X | **LTP** |
| L | ✓ | L | ✓ | ✓ | ✓ | ✓ | L | ✓ | ✓ | ✓ | SS | ✓ | ✓ | SS | ✓ | X | ✓ | SS | X | X | L | X | X | ✓ | ✓ | ✓ | X | ✓ | **LTPHC** |
| L | X | X | X | L | X | ✓ | L | L | L | L | SS | ✓ | X | SS | ✓ | ✓ | X | SS | X | L | X | X | L | L | X | ✓ | L | X | **LTPLFH** |
| ✓ | X | X | L | L | X | ✓ | L | ✓ | L | L | SS | ✓ | X | SS | ✓ | ✓ | X | SS | X | L | X | X | L | ✓ | X | ✓ | L | X | **LTBRDP** |
| L | L | X | L | X | X | L | L | L | ✓ | X | SS | L | X | ✓ | L | X | L | L | X | L | X | X | X | ✓ | X | ✓ | L | L | **LTPPU** |
| L | X | X | X | ✓ | X | ✓ | ✓ | X | L | X | SS | ✓ | X | ✓ | ✓ | ✓ | X | X | L | L | L | L | X | L | X | ✓ | X | ✓ | **LTBRDLFH** |
| ✓ | ✓ | ✓ | ✓ | X | X | X | X | ✓ | ✓ | ✓ | X | X | ✓ | X | X | X | X | X | ✓ | ✓ | X | X | ✓ | ✓ | X | X | ✓ | X | **FB** |
| ✓ | ✓ | ✓ | ✓ | X | X | X | X | ✓ | ✓ | ✓ | X | X | ✓ | X | X | X | X | X | ✓ | ✓ | X | X | ✓ | ✓ | X | X | ✓ | X | **FUSSB** |
| L | X | X | X | ✓ | X | ✓ | ✓ | X | X | X | X | ✓ | X | ✓ | ✓ | ✓ | X | X | L | L | L | L | X | L | X | ✓ | X | ✓ | **LFHUBRD** |
| ✓ | ✓ | ✓ | ✓ | X | X | ✓ | ✓ | ✓ | ✓ | ✓ | SS | ✓ | ✓ | SS | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **FSS** |
| ✓ | ✓ | ✓ | ✓ | X | X | ✓ | ✓ | ✓ | ✓ | ✓ | SS | ✓ | ✓ | SS | ✓ | L | X | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **FSSBRD** |

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 |
| 1⅞" - 18 UNEF | 1⅞" | 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 4.0$mm^2$ cables?

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

# 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.

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.




### IRIS - Std No. ISO/TS 22163:2017

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: 19 (Single Railway Components) Design, development and manufacture of Flexible Conduit Cable Protection Systems.



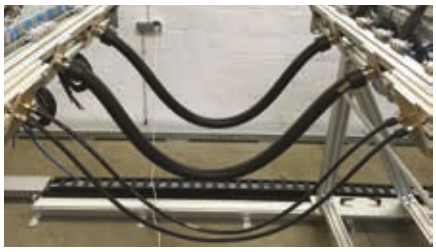

### RISQS

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

### Railway Industry Association (RIA) & Rail Alliance

Flexicon are active members with Railway Industry Association (RIA) the trade association for UK based suppliers to the Railway industry, and also Rail Alliance.

## 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, up to 21,000 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





# UNISTRUT®

A PART OF atkore INTERNATIONAL

Unistrut are the leading supplier of metal framing Systems for over 90 years and specialise in Channel framing, cable managements and Prefabricated framing.

## Unistrut® Worldwide Reach from UK Manufacturer

Unistrut has been a leading manufacturer for over 90 years, producing the original Unistrut metal framing system during the 1930's. The Unistrut product portfolio soon expanded and now includes a variety of cable management solutions and advanced metal framing systems, which continue to be used across the globe. Unistrut has a reputation for industry leading quality and innovation, and this is demonstrated through the company's continued ability to provide mechanical products and solutions to meet almost any requirement.

## Unistrut® Cable Management Solutions

- Cable Tray
- Cable Ladder
- Metal Trunking
- Modular & Pre-fabricated

## Unistrut® For Rail

Unistrut products have been specified on major rail projects across the UK and worldwide. Unistrut Channel and cable management systems are approved for use on LUL including section 12 applications. Other approvals include Cross Rail and Network Rail.

The most recent project being the implementation of the new Cross Rail C610 project in London, which saw a the full product offering being supplied delivering 280,000m of cable tray and 110,000m of cable ladder to the project, and benefitted from the use of Unistrut Modular services, having pre-fabricated curved multiarm brackets supplied to carry cable containment through the new tunnel network.

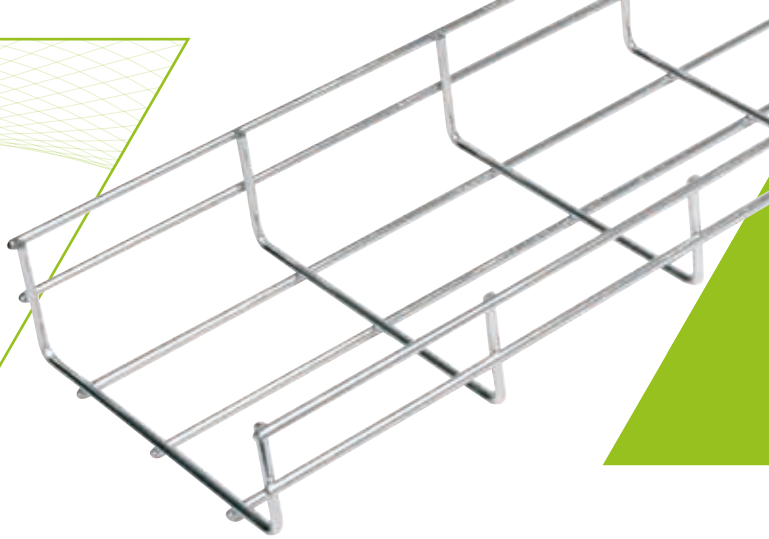
For more information on Unistrut products, and to hear more on how Unistrut products can be used to bring value engineering keeping within budget and to programme in rail projects, contact us on +44 (0)121 580 6300.



marco
cablemanagement

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Marco is the largest manufacturer of Steel Wire Cable Tray in the UK and known industry-wide for their superb quality and innovative cost-saving solutions.



## Marco Cable Management

Marco Cable Management are a leading UK manufacturer of PVC and steel cable management solutions, which includes a wide range of uPVC dado trunking systems, and the UK's largest range of Steel Wire Cable Trays. Marco's products are designed for a wide variety of industrial and commercial installations, with products designed to complement and accommodate all of an installation's cable management requirements.

## Marco for Rail



Marco's range of Steel Wire Cable Trays have been given the authorised for use status by London Underground, and since 2014 have been utilised on a number of projects by the organisation. Marco's products meet and exceed all UK and European standards required by TFL for both power and data cabling.

Marco's steel wire cable tray can be supplied in a hot-dip galvanised finish, ensuring products can be used in harsh environments, where erosion may occur, ensuring Marco's tray can be installed in various installations including tunnels and stations.

Marco's steel wire cable tray systems are commonly seen carrying structured cabling throughout many of the UK's railway stations and facilities.



## Marco Safety Rating

Marco's Steel Wire Cable Tray has also been awarded the E90 fire safety rating. Whilst there is currently no UK equivalent, Marco have utilised the German testing method to ensure our cable trays can withstand and continue to perform in temperatures up to 1000$^{O}$C. Marco's trays can be assigned to functional integrity classes E30, E60 and E90 in accordance with DIN 4102-12.

For more information on the Marco range, and how our range of cable management solutions can help, contact us on +44 (0)1248 725 772.



# FLEXICON

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