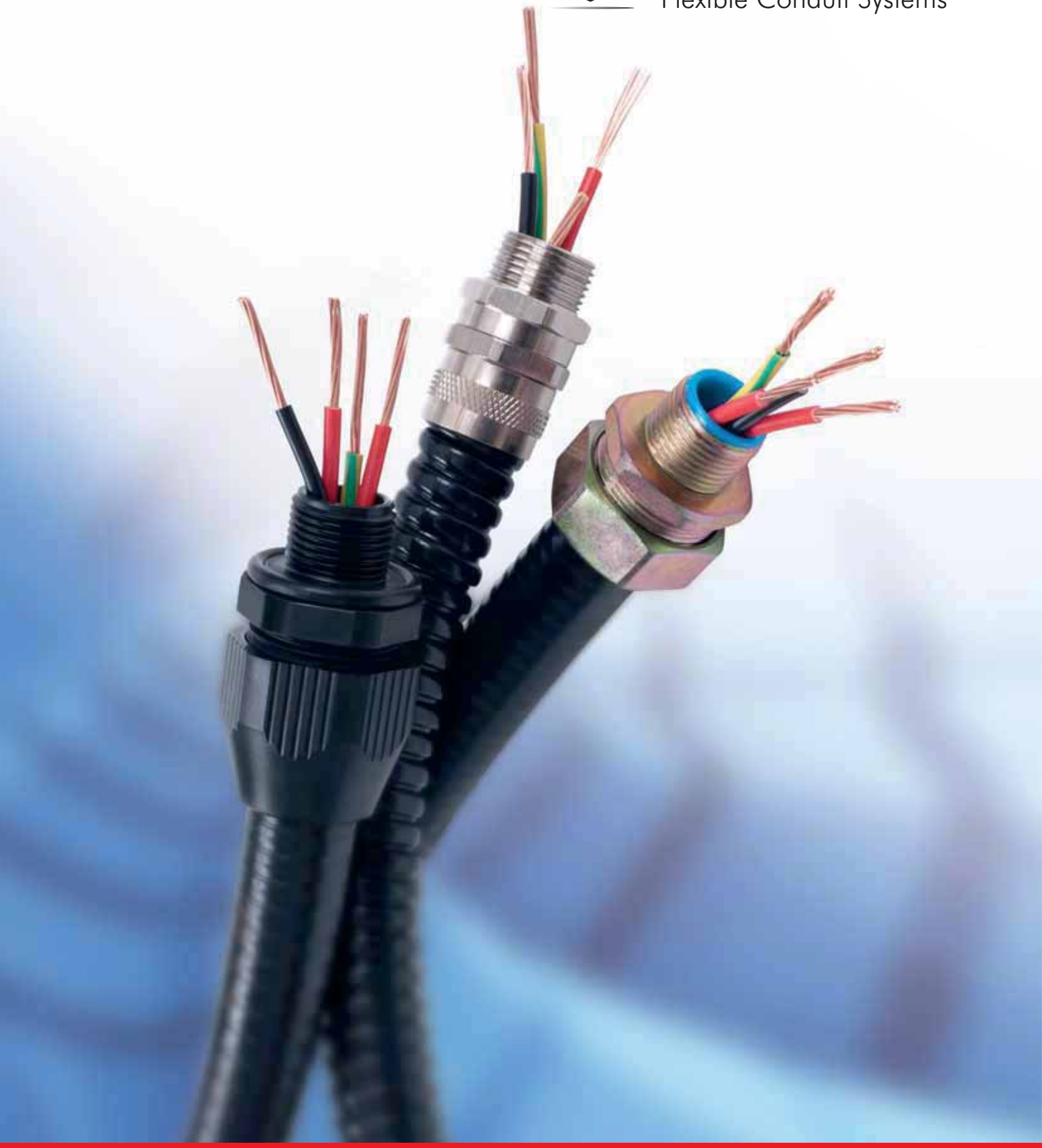
# CABLE SHIELD

Flexible Conduit Systems



TriFlex

Manufacturing

# WHEN SAFETY MATTERS – THERE'S ONLY ONE CHOICE

The **CABLE SHIELD** range of flexible conduit & fittings includes products tested to comply with the rigorous requirements of AS/NZS 2053.1:2001 / IEC 61386:1-2008 Conduit & fittings for electrical installations – General requirements & AS/NZS 2053.8:1995 / IEC 61386:23-2002 Conduit & fittings for electrical installations – Flexible conduits & fittings of metal or composite material.
That means that **CABLE SHIELD** provides peace of mind when it comes to worker safety and asset protection!

**Just look at what CABLE SHIELD can bring to your installation:**

- The only flexible metallic conduit tested to comply with relevant AS/NZS & IEC standards
- The most user friendly, high performance range
- Peace of mind with regard to operator safety
- Lifetime cost savings with reduced maintenance
- Maximum asset & infrastructure protection.

The majority of the range is dedicated to the management, protection and connection of electrical cable. This means that our ranges of protection systems, flexible conduit systems and cable glands are core to the line up.

Triflex is well positioned to supply both your day to day needs and to provide specifiable products with specific performance criteria.

# AUSTRALIAN & NEW ZEALAND STANDARDS

The AS/NZS2053 series of standards outlines a range of strict criteria that conduits and fittings for electrical applications need to meet in order to claim standards compliance and provide the specifier and end user with a high level of confidence that the product is fit for purpose. Testing to the standard should only be relied upon when carried out by an independent and accredited third party.

The **CABLE SHIELD** liquidtight metallic conduits & fittings have been independently tested and comply with:

AS/NZS 2053.1:2001
Conduits & fittings for electrical installations – General requirements

AS/NZS 2053.8:1995
Conduits & fittings for electrical installations – Flexible conduits and fittings of metal or composite material

The combination of these two standards ensures that:

- The internal diameter of the conduit provides the expected carrying capacity.
- The construction is free from burrs, defects or sharp edges that could damage a cable.
- The conduit has sufficient resistance to compression to ensure a Heavy Duty rating.
- The combination of conduit & fitting demonstrates excellent pull-out strength to ensure a safe installation.
- The conduit shows no signs of damage despite 5000 flexings at a rate of 40 per minute.
- The conduit can maintain its Heavy Duty rating at the maximum heat stress of 105°C.
- The conduit is non-flame propagating.

# ARE YOU CONFIDENT THAT THE CONDUIT SYSTEM YOU USE MEETS ALL OF THESE CRITERIA?

# CABLE SHIELD NYLON CONDUIT SYSTEMS

The CABLE SHIELD Nylon conduits are made from Halogen Free Polyamide 6 (PA6) and are recommended for the insulation and mechanical protection of electrical cables.

## Two grades of conduit are available to suit different types of applications:

- Standard Low Fire Hazard and Extra Low Fire Hazard.
- Typical applications include general wiring, machine tools, industrial equipment, automotive, air-conditioning equipment and railway rolling stock.

HALOGEN FREE | RoHs COMPLIANT | LOW FIRE HAZARD | ANTI STATIC

| CAT NO | NOMINAL SIZE (MM) | ID (MM) | OD (MM) | MIN BEND RADIUS (MM) | LENGTH (M) |
|---|---|---|---|---|---|
| STD LOW FIRE HAZARD | | | | | |
| PTM-PA6V2-10B-50 | 10 | 6.5 | 10 | 13 | 50 |
| PTM-PA6V2-12B-50 | 12 | 10 | 13 | 15 | 50 |
| PTM-PA6V2-16B-25 | 16 | 12 | 15.8 | 22 | 25 |
| PTM-PA6V2-16B-50 | 16 | 12 | 15.8 | 22 | 50 |
| PTM-PA6V2-20B-25 | 20 | 16.5 | 21.2 | 35 | 25 |
| PTM-PA6V2-20B-50 | 20 | 16.5 | 21.2 | 35 | 50 |
| PTM-PA6V2-25B-25 | 25 | 23 | 28.5 | 45 | 25 |
| PTM-PA6V2-25B-50 | 25 | 23 | 28.5 | 45 | 50 |
| PTM-PA6V2-32B-25 | 32 | 29 | 34.5 | 50 | 25 |
| PTM-PA6V2-32B-50 | 32 | 29 | 34.5 | 50 | 50 |
| PTM-PA6V2-40B-10 | 40 | 36 | 42.5 | 80 | 10 |
| PTM-PA6V2-40B-25 | 40 | 36 | 42.5 | 80 | 25 |
| PTM-PA6V2-50B-10 | 50 | 48 | 54.5 | 100 | 10 |
| PTM-PA6V2-50B-25 | 50 | 48 | 54.5 | 100 | 25 |
| EXTRA LOW FIRE HAZARD | | | | | |
| PTM-PA6V0-12B-50 | 12 | 10 | 13 | 15 | 50 |
| PTM-PA6V0-16B-50 | 16 | 12 | 15.8 | 22 | 50 |
| PTM-PA6V0-20B-50 | 20 | 16.5 | 21.2 | 35 | 50 |
| PTM-PA6V0-25B-50 | 25 | 23 | 28.5 | 45 | 50 |
| PTM-PA6V0-32B-50 | 32 | 29 | 34.5 | 50 | 50 |
| PTM-PA6V0-40B-25 | 40 | 36 | 42.5 | 80 | 25 |
| PTM-PA6V0-50B-25 | 50 | 48 | 54.5 | 100 | 25 |

## Conduits

### Characteristics

- Flexible with excellent mechanical strength
- Halogen, phosphor and cadmium free
- RoHS compliant
- UV resistant
- Resistant to oils, acid and solvents
- Temperature rating -40°C to 115°C (Intermittent to 150°C)
- Flame Retardant :
  Self extinguishing
  Std Low Fire Hazard – V2 (UL94)
  Extra Low Fire Hazard – V0 (UL94)
- Medium wall thickness
- IP 68
- Anti-static for underground use.

# CABLE SHIELD NYLON FITTINGS

A range of high performance fittings with a unique self locking mechanism, for a quick and secure installation offering watertight protection and outstanding pull-off strength.

## Metric Fittings

| CONDUIT SIZE (MM) | THREAD SIZE | STRAIGHT | 90° | 45° |
|---|---|---|---|---|
| 10 | M10 X 1.5 | PCM1-10B | PCM2-10B | |
| 12 | M12 X 1.5 | PCM1-12B | PCM2-12B | |
| 16 | M16 X 1.5 | PCM1-16B | PCM2-16B | |
| 20 | M20 X 1.5 | PCM1-20B | PCM2-20B | PCM3-20B |
| 25 | M25 X 1.5 | PCM1-25B | PCM2-25B | PCM3-25B |
| 32 | M32 X 1.5 | PCM1-32B | PCM2-32B | PCM3-32B |
| 40 | M40 X 1.5 | PCM1-40B | PCM2-40B | PCM3-40B |
| 50 | M50 X 1.5 | PCM1-50B | PCM2-50B | PCM3-50B |

## PG Fittings

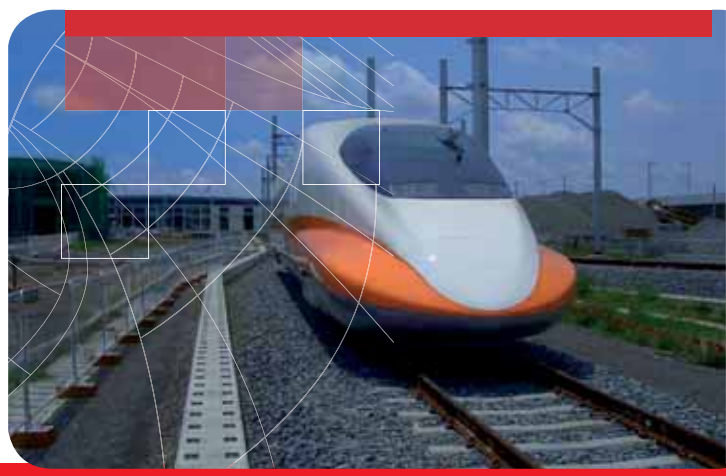
| CONDUIT SIZE (MM) | THREAD SIZE | STRAIGHT | 90° | 45° |
|---|---|---|---|---|
| 10 | PG7 | PCPG1-07B | PCPG2-07B | |
| 12 | PG9 | PCPG1-09B | PCPG2-09B | |
| 16 | PG11 | PCPG1-11B | PCPG2-11B | |
| 20 | PG16 | PCPG1-16B | PCPG2-16B | PCPG3-16B |
| 25 | PG21 | PCPG1-21B | PCPG2-21B | PCPG3-21B |
| 32 | PG29 | PCPG1-29B | PCPG2-29B | PCPG3-29B |
| 40 | PG36 | PCPG1-36B | PCPG2-36B | PCPG3-36B |
| 50 | PG48 | PCPG1-48B | PCPG2-48B | PCPG3-48B |

## Characteristics

- Made of high quality Polyamide 66 (PA66)
- Halogen, phosphor and cadmium free
- Self extinguishing
- UV resistant
- Self locking, push fit installation onto conduit
- Easy to remove, no tool required
- Complete with locknut
- IP66 rating as standard, increased to IP68 with sealing washer
- Temperature rating -40°C to 115°C (Intermittent to 150°C).

## IP68 Fittings

| CONDUIT SIZE (MM) | COUPLING | T-DIST | Y-DIST |
|---|---|---|---|
| 10 | PAM1-68-10B | | |
| 12 | PAM1-68-12B | | PAY-M12 |
| 16 | PAM1-68-16B | | PAY-M16 |
| 20 | PAM1-68-20B | PAT-M20 | PAY-M20 |
| 25 | PAM1-68-25B | PAT-M25 | PAY-M25 |
| 32 | PAM1-68-32B | PAT-M32 | |
| 40 | PAM1-68-40B | | |
| 50 | PAM1-68-50B | | |



# ACCESSORIES

## Spin Couplings

The spin coupling turns a standard fitting into a swivel fitting. The coupler accepts both 45° and 90° screwed fittings and allows easy rotation of the fitting during and after installation.

| CONDUIT SIZE (MM) | METRIC THREAD SIZE | CAT. NO. | PG THREAD SIZE | CAT. NO |
|---|---|---|---|---|
| 16 | M16 X 1.5 | PCMS-16 | PG11 | PCPGS-11 |
| 20 | M20 X 1.5 | PCMS-20 | PG16 | PCPGS-16 |
| 25 | M25 X 1.5 | PCMS-25 | PG21 | PCPGS-21 |
| 32 | M32 X 1.5 | PCMS-32 | PG29 | PCPGS-29 |
| 40 | M40 X 1.5 | PCMS-40 | PG36 | PCPGS-36 |
| 50 | M50 X 1.5 | PCMS-50 | PG48 | PCPGS-48 |

### Characteristics

- Made from high quality nickel plated brass
- Metric and PG threads
- IP66 as standard, IP68 with sealing washer.

## Mounting Brackets

A range of mounting brackets for quickly and easily attaching **CABLE SHIELD** conduit to equipment and structures.

| CONDUIT SIZE (MM) | CAT. NO. | MOUNTING HOLE (MM) |
|---|---|---|
| 10 | PTSSM-10B | 4.2 |
| 12 | PTSSM-12B | 4.2 |
| 16 | PTSSM-16B | 4.2 |
| 20 | PTSSM-20B | 4.2 |
| 25 | PTSSM-25B | 4.2 |
| 32 | PTSSM-32B | 4.2 |
| 40 | PTSSM-40B | 4.2 |
| 50 | PTSSM-50B | 4.2 |

### Characteristics

- Made from Polyamide 66
- Feature an inbuilt snap cover, easily releasable and reusable
- Screw mounted for secure installation
- Temperature rating -40°C to 115°C
- Halogen free
- UV resistant
- Flame retardant - self extinguishing.

## P Clamps

P Clamps are used to mount conduit on equipment or structures.

| CONDUIT SIZE (MM) | CAT. NO. | FIXING SCREW |
|---|---|---|
| 10 | PTCM-10 | M4 |
| 12 | PTCM-12 | M4 |
| 16 | PTCM-16 | M4 |
| 20 | PTCM-20 | M4 |
| 25 | PTCM-25 | M5 |
| 32 | PTCM-32 | M5 |
| 40 | PTCM-40 | M6 |
| 50 | PTCM-50 | M6 |

### Characteristics

- Made from plated steel with UV resistant PVC cover
- Screw fixed for a secure installation.

## Locknuts

| THREAD SIZE | CAT. NO. | PG THREAD SIZE | CAT. NO. |
|---|---|---|---|
| M10 X 1.5 | PAM-LN-10B | PG7 | PAPG-LN-07B |
| M12 X 1.5 | PAM-LN-12B | PG9 | PAPG-LN-09B |
| M16 X 1.5 | PAM-LN-16B | PG11 | PAPG-LN-11B |
| M20 X 1.5 | PAM-LN-20B | PG16 | PAPG-LN-16B |
| M25 X 1.5 | PAM-LN-25B | PG21 | PAPG-LN-21B |
| M32 X 1.5 | PAM-LN-32B | PG29 | PAPG-LN-29B |
| M40 X 1.5 | PAM-LN-40B | PG36 | PAPG-LN-36B |
| M50 X 1.5 | PAM-LN-50B | PG48 | PAPG-LN-48B |

### Characteristics

- Made from Polyamide 66
- Temperature rating -40°C to 100°C
- Metric or PG Threads.

## Sealing Washers

Sealing washers are used on the fitting thread to seal between the fitting and the enclosure and provide an IP68 seal.

| METRIC THREAD SIZE | CAT. NO. | PG THREAD SIZE | CAT. NO. |
|---|---|---|---|
| M12 X 1.0 | SRM-10 | PG7 | SRPG-07 |
| M12 X 1.5 | SRM-12 | PG9 | SRPG-09 |
| M16 X 1.5 | SRM-16 | PG11 | SRPG-11 |
| M20 X 1.5 | SRM-20 | PG16 | SRPG-16 |
| M25 X 1.5 | SRM-25 | PG21 | SRPG-21 |
| M32 X 1.5 | SRM-32 | PG29 | SRPG-29 |
| M40 X 1.5 | SRM-40 | PG36 | SRPG-36 |
| M50 X 1.5 | SRM-50 | PG48 | SRPG-48 |

## Characteristics

- Made from Tesnit high performance fibre
- Temperature Rating -40°C to 200°C
- IP68
- Metric or PG Threads.

## End Sleeves

End sleeves are used to transition from conduit to a cable. The sleeve seals and protects the cable passing through the end of the tubing.

| CONDUIT SIZE (MM) | CAT. NO. |
|---|---|
| 10 | TAEC-M10 |
| 12 | TAEC-M12 |
| 16 | TAEC-M16 |
| 20 | TAEC-M20 |
| 25 | TAEC-M25 |
| 32 | TAEC-M32 |
| 40 | TAEC-M40 |
| 50 | TAEC-M50 |

## Characteristics

- Made from Thermoplastic Elastomer (TPE)
- Temperature rating -40°C to 100°C (Intermittent to 150°C).

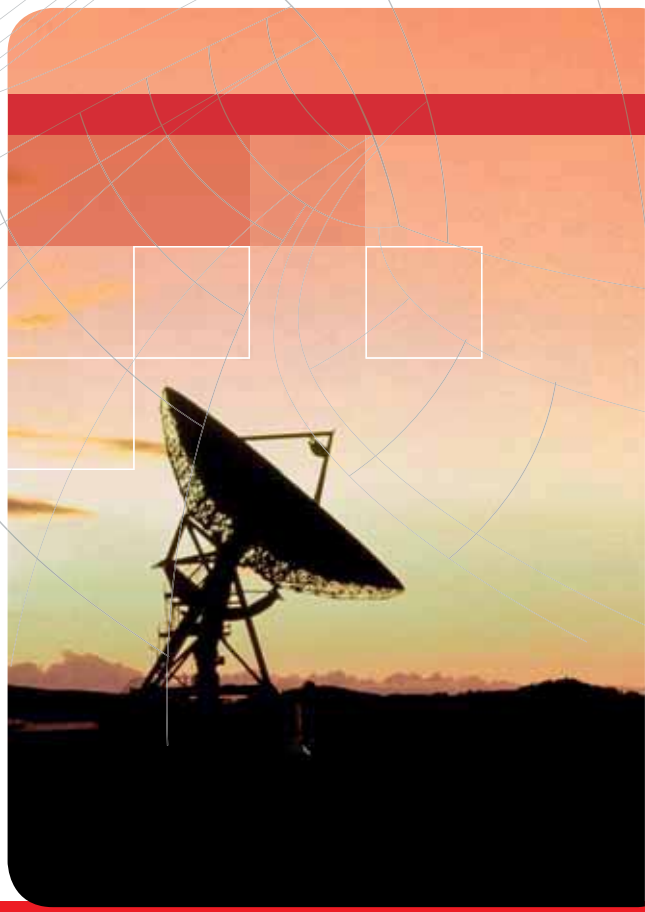
## Flanges

The **CABLE SHIELD** flange can be combined with a straight or elbow connector to create a complete flange connector for mounting on enclosures or equipment.

| METRIC THREAD SIZE | CAT. NO. |
|---|---|
| M25 X 1.5 | PCFM-M25 |
| M32 X 1.5 | PCFM-M32 |
| M40 X 1.5 | PCFM-M40 |
| M50 X 1.5 | PCFM-M50 |

## Characteristics

- Made of high quality Polyamide 66 (PA66)
- Halogen, phosphor and cadmium free
- Self extinguishing
- UV Resistant
- IP67 rating
- Temperature rating -40°C to 115°C (Intermittent to 150°C).



# TECHNICAL INFORMATION & GUIDANCE

**CABLE SHIELD conduits are tested to rigorous Australian and International standards to ensure performance and safety.**

## STANDARDS & DIRECTIVES

**Standards Australia (AS)** – Standards Australia is Australia's peak Standards body. It co-ordinates standardisation activities, develops internationally aligned Australian Standards and facilitates the accreditation of other Standards Development Organisations.

It should be well noted that conduit can be tested to the AS/NZS standard however there is no "certification" process. In all cases it is the performance of the entire system, conduit and fittings, that should be considered and in fact the fittings are more important in assessing the safety, integrity and performance of a system.

**Underwriters Laboratory (UL)** – Based in the United States, Underwriters Laboratories® is an independent product safety certification organization that has been testing products and writing safety standards for more than a century. There are two UL marks that are commonly found related to product certification:

**UL Listing Mark**– this indicates that a representative samples of products has been found to meet UL's safety requirements and is therefore considered free of reasonably foreseeable risk of fire, electric shock and related hazards.

**UL Recognised Component Mark** – this indicates that the product has been certified as a part of a finished product. Just because a finished product contains UL recognised parts however does not mean the final product is UL certified.

**Canadian Standards Association (CSA)** – has several arms one of which is involved in developing standards designed to enhance public health and safety and another one involved in product testing and certification to Canadian and international standards.

**CSA Mark** – a product bearing this mark is certified primarily to applicable Canadian standards. Customers can be confident that the product has been evaluated through a formal process involving examination, testing and follow-up inspection and that it complies with applicable standards for safety and performance.

**National Electrical Manufacturers Association (NEMA)** – in addition to roles in policy and industry data, NEMA provides a forum for the development of technical standards in the interest of industry and users.

**Restriction of Hazardous Substances (RoHS) Directive** – came into force in EU member states in 2006 and restricts the use of six hazardous substances in the manufacture of electrical and electronic equipment. The directive stipulates agreed levels of lead, cadmium, mercury, hexavalent chromium and the flame retardants PBB and PBDE. It is closely related to the Waste Electrical and Electronic Directive (WEEE). Other jurisdictions including China, USA and Australia have since been evaluating and implementing similar legislation.

# CONDUIT IN HAZARDOUS AREAS

Australia is still in a transition stage between the old series of hazardous area standards and the new ones that are harmonised with the IEC standards. Currently there are over 10 series including more than 50 individual standards that deal with classification, equipment design and manufacture, testing, inspection & maintenance, selection, installation and safe work practises in relation to electrical equipment in hazardous areas.

All electrical equipment installed in hazardous areas must be explosion protected. The specifier must consider not only the Zone Classification but also the Temperature Classification, the Gas Group (where appropriate) and the IP rating for outdoor use and/or corrosion protection.

### ANZEx Scheme – Certification of Equipment for Explosive Atmospheres (Formerly AUSEx)

In Australia and New Zealand the installation standards for electrical equipment to be installed in a hazardous area requires "Proof of Compliance." Either a Certificate of Conformity within the ANZEx scheme or an IECEx Certificate of Conformity is deemed to comply with this requirement. IECEx is the first international certification scheme and certificates issued under this scheme will be recognised in all member countries including Australia, UK, France, Germany, Canada and the USA.

# IP RATING

The IP rating indicates the degree of Ingress Protection provided by enclosures for electrical equipment and is defined in Australian Standard AS60529:2004 – Degrees of protection provided by enclosures (IP Code).

The first numeral refers to the protection against the ingress of solid objects and the second refers to the protection against the ingress of water.

| PROTECTION AGAINST SOLID OBJECTS | |
|---|---|
| 0 | No protection |
| 1 | Protection against objects >50mm$^2$ and against accidental access to hazardous parts by the back of the hand |
| 2 | Protection against objects larger than 12.5mm$^2$ and against access of fingers to hazardous parts |
| 3 | Protection against the access of tools, wires or other solid objects other solid objects larger than 2.5mm$^2$ |
| 4 | Protected against the access of solid foreign bodies larger than 1mm$^2$ |
| 5 | Protected against the entry of dust in sufficient quantity to interfere with the operation of equipment |
| 6 | Completely protected from the entry of dust |

| PROTECTION AGAINST WATER | |
|---|---|
| 0 | No protection |
| 1 | Protected against drops of water falling vertically |
| 2 | Protection against drops of water falling at up to 15°deg from vertical |
| 3 | Protection against drops of water sprayed at angles at up to 60°deg from vertical |
| 4 | Protected against spraying or splashing water from all practicable angles |
| 5 | Protected from low pressure jets of water from all practicable angles |
| 6 | Protected against strong jets of water from all practicable angles, equivalent to the force of heavy seas |
| 7 | Protected against temporary immersion at a specified depth for a specified time |
| 8 | Protected against continuous immersion at a specified depth and pressure |

# CHEMICAL RESISTANCE

**The information in this table is provided as a guide only.**
**Testing should be done for individual situations with the relevant conduit system.**
**Results shown are for chemicals at room temperature.**

R = Resistant, LR = Limited Resistance, NR = Non-resistant, ND = No data

| CHEMICAL | PVC | TPR | PA6 | GAL STEEL |
|---|---|---|---|---|
| Acetic Acid 40% | LR | LR | NR | NR |
| Acetic Acid 10% | R | R | LR | NR |
| Acetone | NR | R | R | R |
| Aluminium Chloride | R | R | LR | NR |
| Ammonium Chloride | R | R | R | NR |
| Benzaldehyde | NR | R | LR | R |
| Benzene | NR | R | R | R |
| Bromine | NR | NR | NR | ND |
| Butyl Alcohol | R | R | R | ND |
| Calcium Chloride 20% | R | R | NR | LR |
| Carbon Tetrachloride | NR | NR | R | R |
| Chlorine (water solution) <5% | LR | LR | NR | NR |
| Chloroform | NR | NR | NR | R |
| Citric Acid | R | R | R | R |
| Copper Sulphate | R | R | LR | R |
| Cresol | NR | NR | NR | R |
| Dimethyl Formamide | NR | NR | R | ND |
| Diesel Oils | LR | LR | R | R |
| Diethylene Glycol | LR | LR | R | R |
| Ethanol | LR | R | R | R |
| Ether | NR | NR | R | R |
| Ethyl Acetate | NR | R | R | ND |
| Ethylene Glycol | R | R | R | NR |
| Ferrous Chloride | R | R | LR | NR |
| Formic Acid 10% | R | R | NR | ND |
| Freon 32 | LR | LR | R | NR |
| Hydrochloric Acid 40% | LR | R | NR | NR |
| Hydrochloric Acid 10% | R | R | NR | NR |
| Hydrogen Peroxide 10% | R | R | LR | NR |
| Kerosene | LR | NR | R | R |
| Lactic Acid | R | R | LR | NR |
| Lubricating Oils, Greases & Soaps | R | R | R | R |
| Magnesium Chloride | R | R | R | NR |

| CHEMICAL | PVC | TPR | PA6 | GAL STEEL |
|---|---|---|---|---|
| Magnesium Sulphate | R | R | R | ND |
| Methanol | NR | R | LR | R |
| Methyl Acetate | NR | NR | R | ND |
| Methyl Bromide | NR | NR | NR | R |
| Methyl Ethyl Ketone | NR | R | R | R |
| Mineral Oil | R | NR | R | R |
| Nitric Acid 10% | R | R | NR | NR |
| Nitric Acid 35% | LR | NR | NR | NR |
| Nitric Acid 70% | NR | NR | NR | NR |
| Oxalic Acid 10% | R | R | LR | NR |
| Ozone | LR | LR | NR | NR |
| Petroleum | R | R | R | R |
| Phenol | LR | R | NR | R |
| Phosphoric Acid 10% | R | R | NR | ND |
| Phosphoric Acid 85% | R | R | NR | ND |
| Potassium Hydroxide | R | R | LR | ND |
| Seawater | R | R | R | NR |
| Silver Nitrate | R | R | R | NR |
| Sodium Chloride | R | R | R | NR |
| Sodium Hydroxide 10% | R | R | R | NR |
| Sulphur Dioxide <5% | NR | R | NR | NR |
| Sulphur Dioxide (Liquid) | NR | R | NR | NR |
| Sulphuric Acid 50% | R | R | NR | NR |
| Sulphuric Acid 98% | NR | NR | NR | NR |
| Toluene | NR | NR | R | R |
| Transformer Oil | R | R | R | R |
| Trichlorethane | NR | NR | R | NR |
| Trichlorethylene | NR | NR | R | NR |
| Turpentine | LR | NR | R | R |
| Vegetable Oils & juices | R | R | R | R |
| Water | R | R | R | NR |
| Zinc Chloride 10% | R | R | NR | NR |

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