

PMA Ex-System

ATEX-IECEx approved
cable protection system



ABB provides ATEX-IECEX approved flexible nonmetallic cable protection solution for hazardous areas.

All our brands are built upon four product & service solution platforms. Platforms that address you or your customers' critical electrical & lighting needs covering the protection of data, energy, processes, assets and personal safety.

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Introduction

Low voltage products for hazardous areas

At ABB, our focus is on improving your business performance by providing practical, reliable electrical products & services. To connect & protect for life.

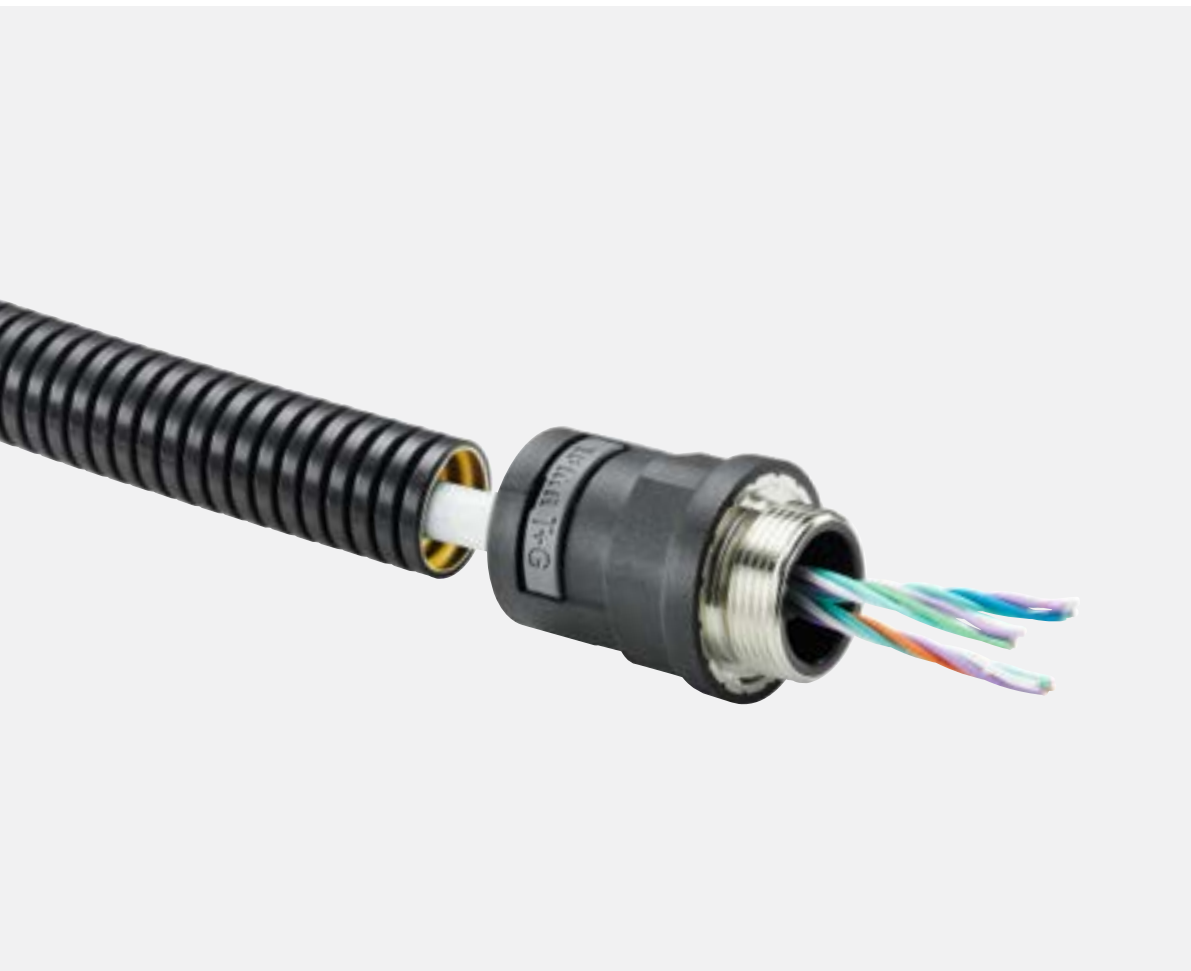
Our extensive engineering, supply chain management and technical sales support teams are committed to understanding everything that impacts your ability to accomplish your business objectives by reducing your total cost of ownership.

Whether you are designing, installing, operating, maintaining or owning an office building, off-shore platform, hospital, or a high speed train, power generating plant, machine equipment or a manufacturing facility, ABB engineered products fit and function in your application while providing superior performance, sustainability, and value throughout the project life cycle.

All our brands are built upon four product & service solution platforms. Platforms that address you or your customers' critical electrical & lighting needs covering the protection of data, energy, processes, assets and personal safety. Beyond high performance application characteristics, ABB products, information and services facilitate and speed up your time critical assembly, installation or maintenance process.

Typical applications:

- Light fittings, boxes and enclosures
- Customised control panels for hazardous areas
- Ongoing R&D program for innovative and high performance products
- ATEX & IECEx approved nylon - or flexible metallic cable protection





COMPLETE CABLE PROTECTION PORTFOLIO

To solve everyday problems in the area's of Wire & Cable Management, Cable Protection, Power Connection & Control and Safety.

Food & Beverage applications



Food & Beverage Industry

ABB offers a range of products for the food processing market, including products for use in areas where stainless steel is preferred as well as areas classified as hazardous.

ABB can offer stainless steel control stations for use on automated food processing and packaging machines as well as lighting specifically designed for use in dust filled atmospheres such as flour mills.

ABB has a range of products designed for being used in all beverage production sectors in the malting, brewing, wine, spirits or soft drink business. PMA-Ex can supply non-metallic conduit and fittings that work with other ABB products to reach the needs of hazardous areas where explosive gases or other places where the risk of explosion is considered to be extremely high.

Chemical & Pharmaceutical applications



01

02

—
01 Chemical engineering
- Explosion proof

—
02 Pharmaceutical
production -
Explosion proof

Chemical & Pharmaceutical Industry

The ABB range of products and solutions are ideal for use in the chemical and pharmaceutical industry. Whether it is upstream in the primary production stage or downstream in the packing stage. Many of the processes and applications used in these areas require approvals to hazardous area standards making PMA-Ex range of conduits & fittings ideal.









Certifications and Standards

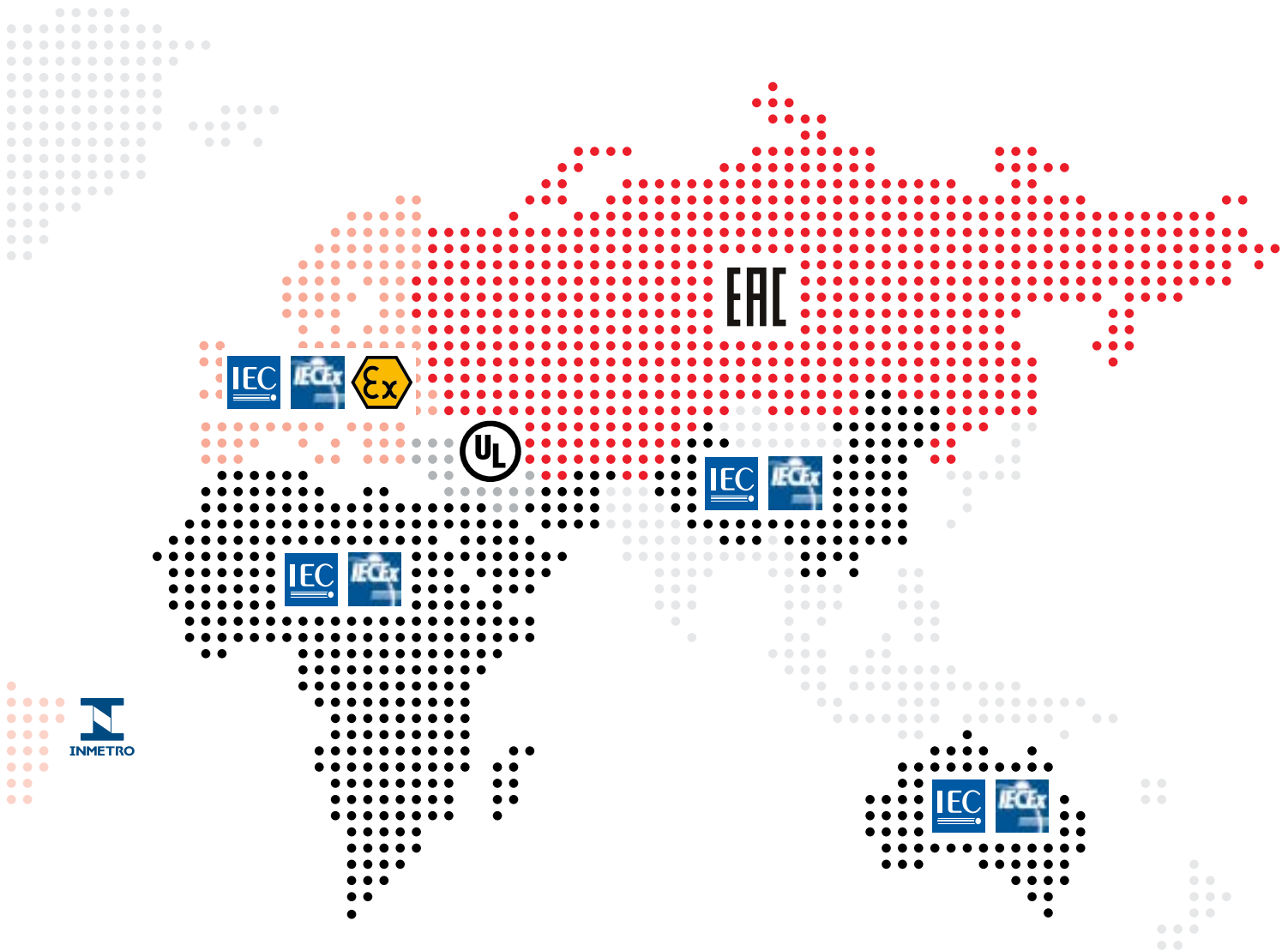
Global Guide









- Africa, Australia, Asia (IECEX)
- Canada (CSA & IECEx)
- South America (UL and IECEx)
- Europe (ATEX and IECEx)
- USA, Mexico (UL)
- Brazil (InMetro)
- Russia (EAC and EAC Ex)
- Rest of World (Mixed and Local)

World standards

| Region | Basic Electrical Code | Base Standard | Symbols | Hazardous Area Standards | Symbols |
|--------|-----------------------|--------------------------------------|--|---|---|
| Europe | IEC | IEC/EN 62444 - Cable Glands | CE  | IEC/EN 60079-0 - General Requirements | EX  IECEX  |
| | | IEC/EN 61386 - Conduit Systems | | IEC/EN 60079-1 - Flameproof Equipment | |
| | | IEC/EN 60529 - Ingress Protection | | IEC/EN 60079-7 - Increased Safety IEC/EN 60079-31 - Dust Enclosure | |
| US | NEC | UL514B - Fittings | UL  UR  | UL2225 -xxxx | UL  |
| | | UL360 - Electrical Conduit | | UL1203 - xxxx | |
| | | UL1696 - Protective Tubing | | | |
| Canada | CEC | CSA C22.2-18.3 - Fittings | CSA  | CSA C22.2-25 -30 -174 -94 | CSA  |
| | | CSA C22.2-54-04 - Electrical Conduit | | CSA C22.2/IEC 60079-0 - General Requirements | |
| | | CSA C22.2-227.3 - Protective Tubing | | CSA C22.2/IEC 60079-1 - Flameproof Equipment | |
| | | | | CSA C22.2/IEC 60079-7 - Increased Safety | |
| | | | | CSA C22.2/IEC 60079-31 - Dust Enclosure | |



World standards

| Region | Basic Electrical Code | Base Standard | Symbols | Hazardous Area Standards | Symbols |
|--------|-----------------------|---|---|---|---|
| Russia | IEC | IEC/EN 62444 - Cable Glands | EAC  | ГОСТ Р МЭК 60079-0 - General Requirements | EAC Ex  |
| | | IEC/EN 61386 - Conduit Systems | | ГОСТ Р МЭК 60079-7 - Increased Safety | |
| | | IEC/EN 60529 - Ingress Protection | | ГОСТ Р МЭК 60079-31 - Dust Enclosure | |
| | | | | ГОСТ IEC 60079-1 - Flameproof Equipment | |
| Brazil | IEC | ABNT NBR IEC 62444 - Cable Glands | InMetro  | ABNT NBR IEC 60079-0 - General Requirements | InMetro (Segurança)  |
| | | ABNT NBR IEC 61386 - Conduit Systems | | ABNT NBR IEC 60079-1 - Flameproof Equipment | |
| | | ABNT NBR IEC 60529 - Ingress Protection | | ABNT NBR IEC 60079-7 - Increased Safety | |
| | | | | ABNT NBR IEC 60079-31 - Dust Enclosure | |
| China | IEC | IEC/EN 62444 - Cable Glands | | GB3836.1 - General Requirements | CNEX  |
| | | IEC/EN 61386 - Conduit Systems | | GB3836.2 - Flameproof Equipment | |
| | | IEC/EN 60529 - Ingress Protection | | GB3836.3 - Increased Safety | PCEC  |
| | | | | GB12476.1 - Dust General Requirements | |
| | | | | GB12476.5 - Dust Enclosure | |

Standards, zone definitions & product markings

Zone definitions – Onshore gases & vapor

Zone 0

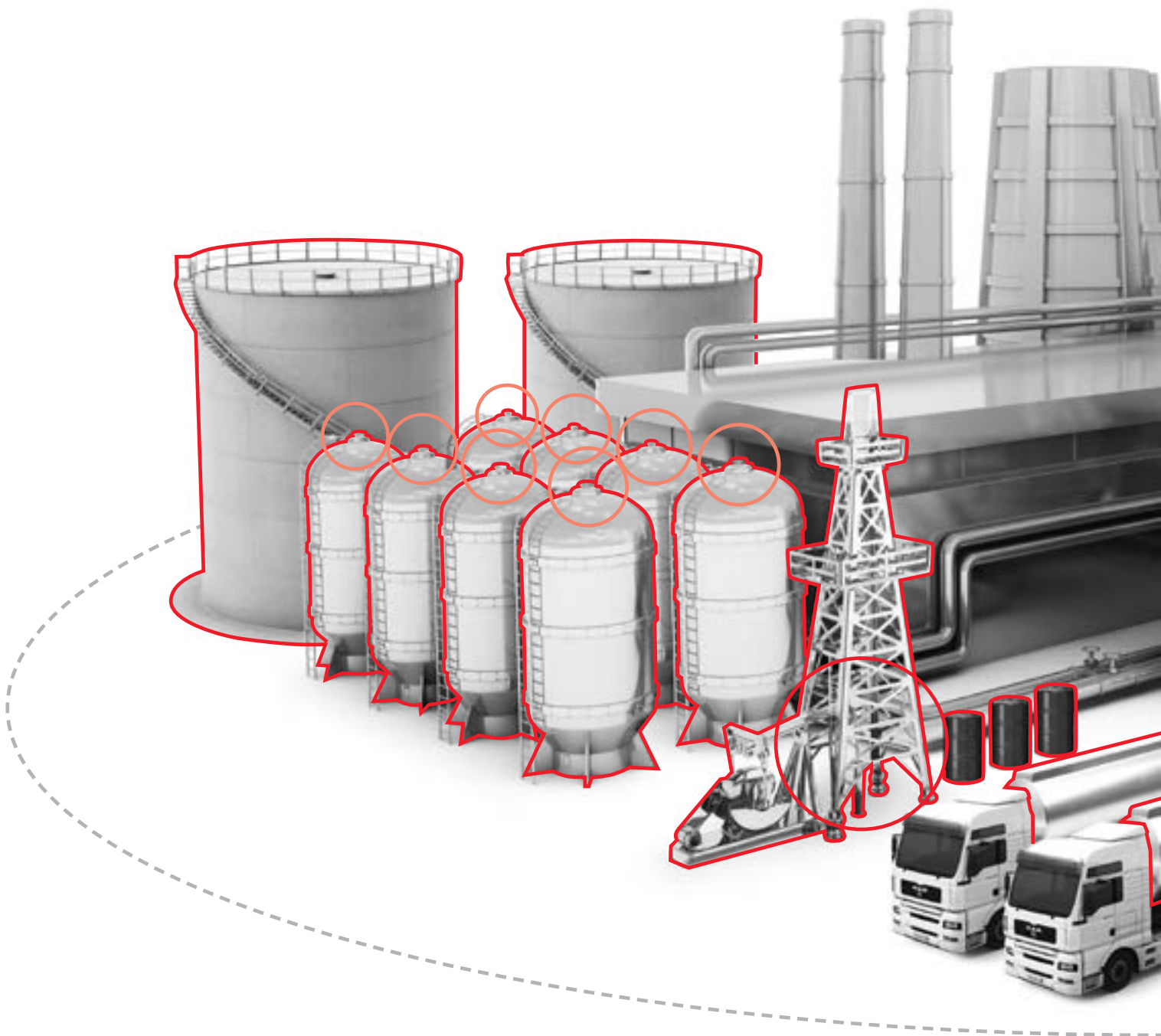
Permanent / Frequent

Place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapor or mist is present continuously or for long periods, or frequently.

Zone 1

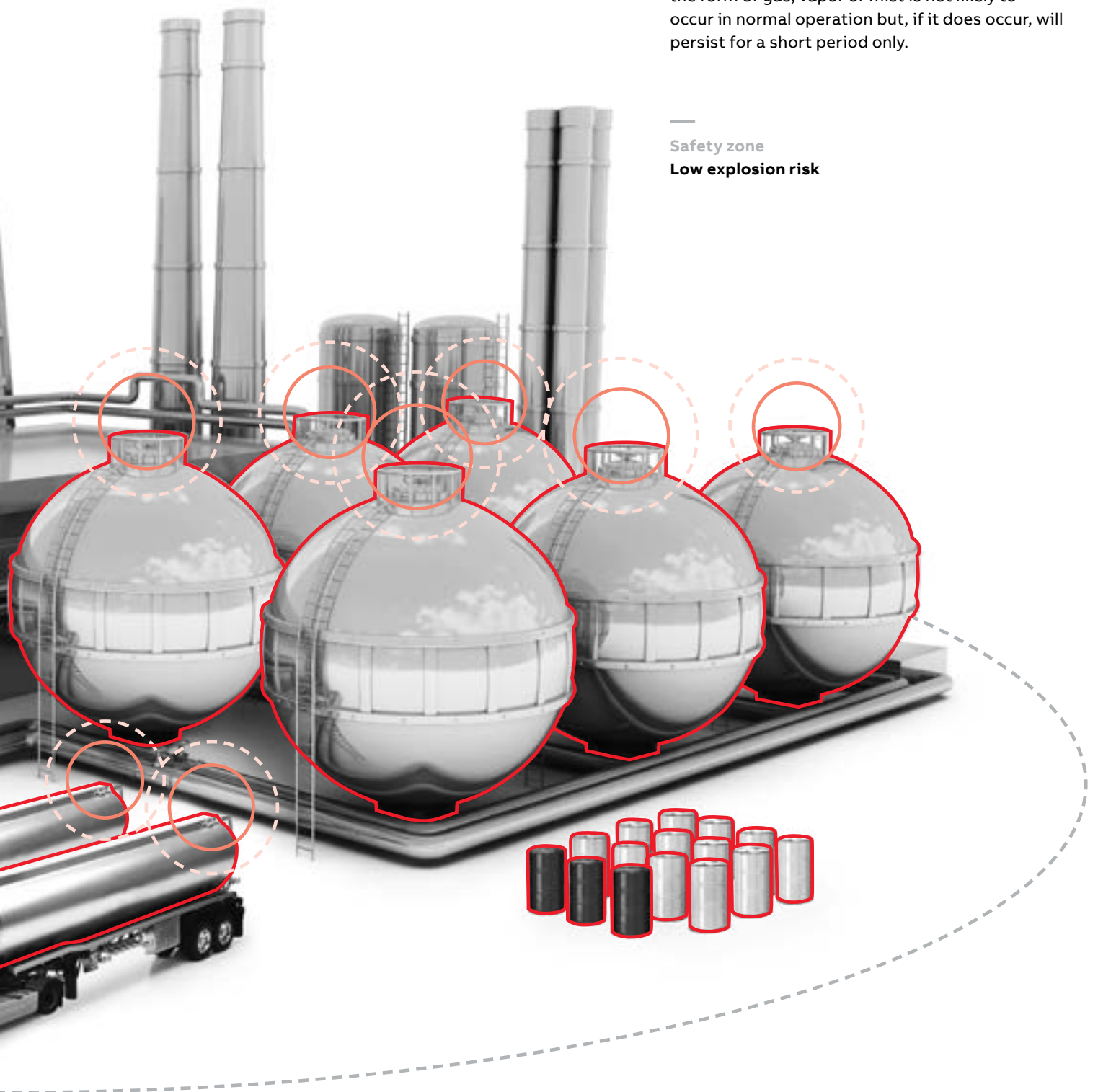
Occasional

Site where an atmosphere consisting of a mixture of air and flammable substances in the form of gas, vapor or mist is likely to arise occasionally during normal operation.



Zone 2**Gas irregular / Short duration**

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

Safety zone**Low explosion risk**

Standards, zone definitions & product markings

Zone definitions – Offshore gases & vapor

Zone 0

Permanent / Frequent

Place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapor or mist is present continuously or for long periods, or frequently.

Zone 1

Occasional

Site where an atmosphere consisting of a mixture of air and flammable substances in the form of gas, vapour or mist is likely to arise occasionally during normal operation.

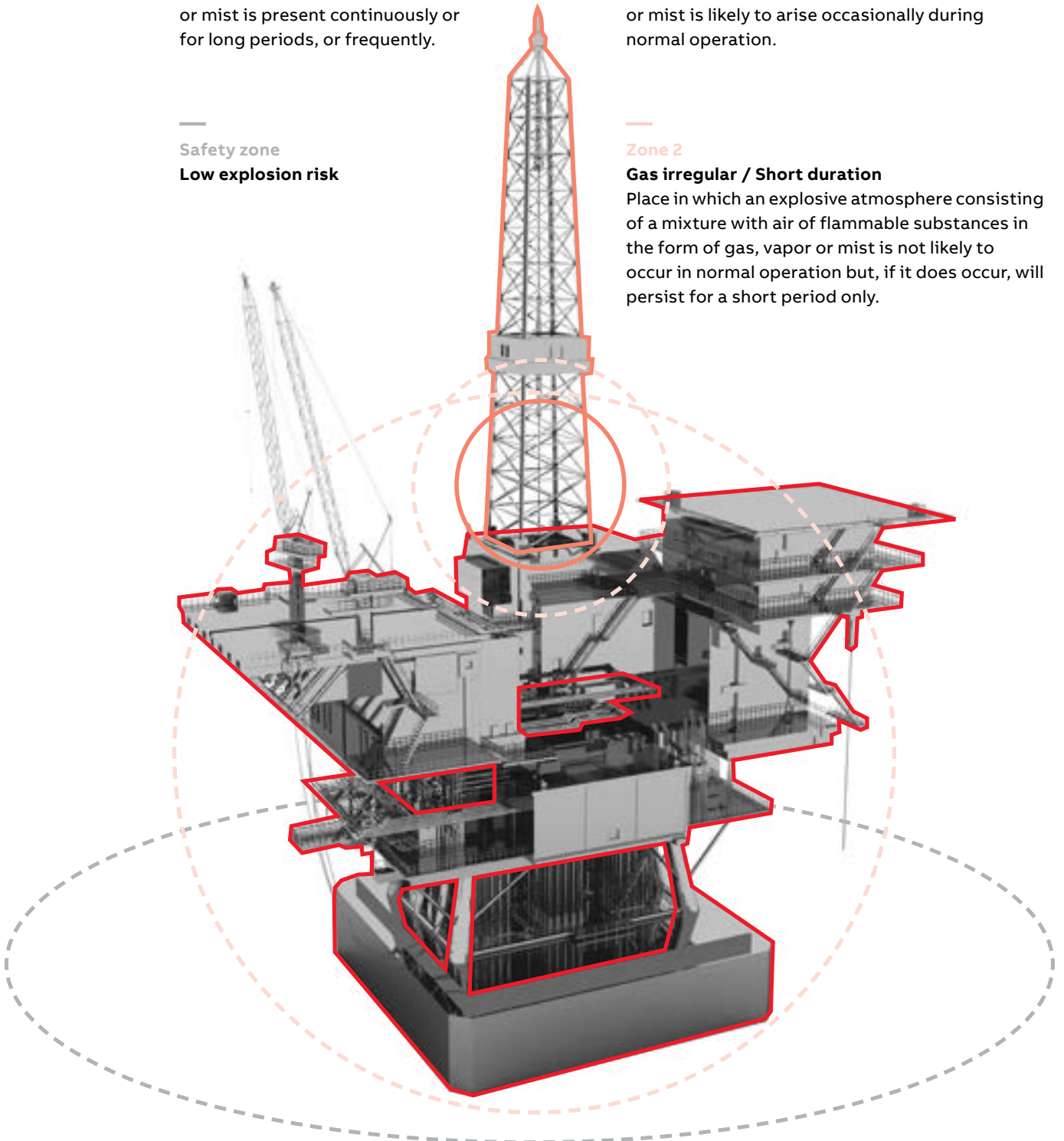
Safety zone

Low explosion risk

Zone 2

Gas irregular / Short duration

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



Standards, zone definitions & product markings

Zone definitions – Dust

Zone 20

Permanent / Frequent

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

Zone 21

Occasional

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

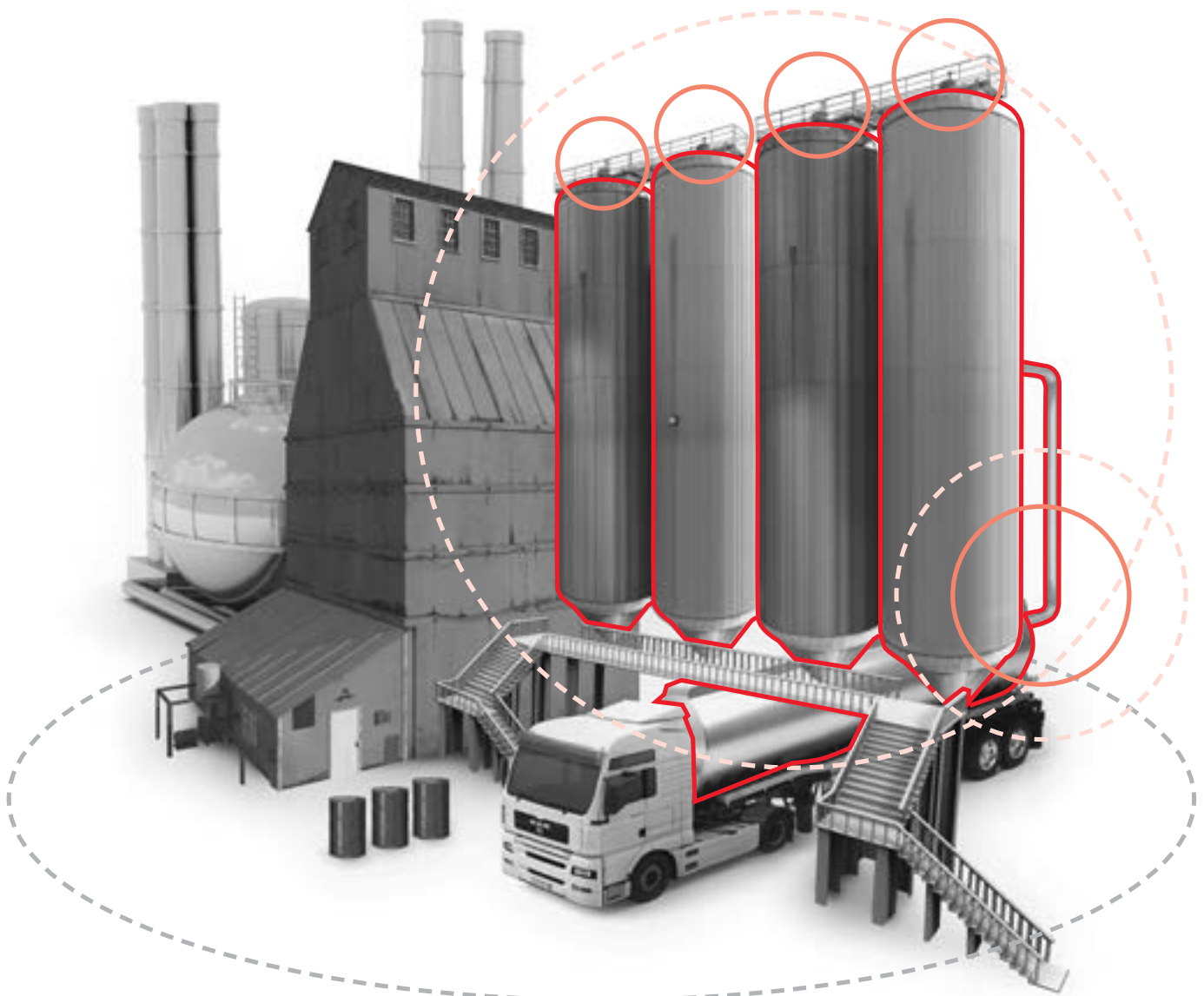
Zone 22

Dust Irregular / Short Duration

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

Safety Zone

No Explosion Risk



Standards, zone definitions & product markings

NEC - Class and Division System

Classifications of hazardous areas

| Classifications of hazardous areas | | Descriptions | Equipment Usage | Comparison |
|--|-------------------|--|---|--------------------|
| Mining | | Not covered in the NEC. See MSHA, Specific requirements for Mining Equipment and Safety Standards. | | |
| Gas environments | | 1. Ignitable concentrations of gases can exist under normal operating conditions. 2. Ignitable concentrations of gases may exist frequently because of repair, maintenance, leakage. 3. Equipment breakdown or faulty operation that may create both an ignitable gas release and a source of ignition from electric equipment failure . | Class I Div 1 | Zone 0 Zone 1 |
| | Class I | | | |
| | Division 2 | 1. Gases are normally confined to within closed containers or closed systems requiring accidental rupture, breakdown or abnormal operation for escape. 2. Where ignitable concentrations of gases are normally prevented by positive pressure ventilation. 3. Location adjacent to a Class I Division 1 location where ignitable concentrations of gases might occasionally be communicated. | Class I Div 1 and Class I Div 2 | Zone 2 |
| Dust environments | | 1. Combustible dust is in the air under normal operating conditions sufficient to product explosive or ignitable mixtures. 2. Mechanical failure or abnormal operation might simultaneously produce ignitable mixtures and an electrical source of ignition. 3. Group E combustible dusts may be present in sufficient quantities. | Class II Div 1 | Zone 20 Zone 21 |
| | Class II | | | |
| | Division 2 | 1. Combustible dust due to abnormal operations may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. 2. Sufficient dust accumulations could become suspended in air by equipment malfunction. 3. Dust accumulations could be ignitable due to electrical equipment overheating, abnormal operation or failure. | Class II Div 1 and Class II Div 2 | Zone 22 |
| Fibres and Flyings environments | Division 1 | Easily ignitable fibres and flyings are handled, manufactured or used | Class III Div 1 | Zone 20 Zone 21 |
| | Class III | | | |
| | Division 2 | Easily ignitable fibres and flyings are stored or handled other than in the process of manufacture | Class III Div 1 and Class III Div 2 | Zone 22 |

Standards, zone definitions & product markings

NEC - Class and Division System

Gas & dust groups

| Group | Typical | | Examples |
|-----------------------------|------------------|---|--|
| Gases | A | Acetylene | Acetylene is the only gas in Group A |
| | B | Hydrogen | Acrolein, Butadiene, Ethylene Oxide, Formaldehyde (gas), Process Gas, Propyl Nitrate |
| | C | Ethylene | Acetaldehyde, Diethyl Ether, Hydrogen Sulphide |
| | D | Propane | Acrylonitrile, Ammonia, Butane, Fuel Oil 1, Gasoline, Heptane, Methane, |
| Dusts | E | Combustible metal dusts | Aluminium, Magnesium |
| | F | Combustible carbonaceous dusts that have more than 8% total entrapped volatiles | Coal, Carbon Black, Charcoal, Coke |
| | G | Combustible dusts not included in Group E or F | Flour, Grain, Wood (saw dust), Plastic, Chemicals |
| Fibers & Flyings | No Groups | Fibres/flyings ("big dust") not in suspension in ignitable quantities | Wood shaving, Rayon, Cotton |

| Protection Concepts | Techniques (Types) | ANSI (UL) /CSA Standards | | Class I | Class II | Class III |
|---------------------|--|-----------------------------------|-------------|---------|----------|-----------|
| By Enclosure | Explosion proof | ANSI / UL 1203 | UL 60079-1 | 1 or 2 | | |
| | Dust Ignition proof | ANSI / UL 1203 | UL 60079-31 | | 1 or 2 | |
| By Exclusion | Purged and Pressurized | ANSI/NFPA 496 | UL 60079-2 | 1 or 2 | 1 or 2 | 1 or 2 |
| By Equipment | Intrinsic Safety* | ANSI/UL 913 | UL 60079-11 | 1 or 2 | 1 or 2 | 1 or 2 |
| | Nonincendive (circuit, equipment, component) | ANSI / ISA-12.12.01 | UL 60079-15 | 2 | 2 | 1 or 2 |
| | Oil Immersion | | UL 60079-6 | 2 | | |
| | Hermetically Sealed | ANSI / ISA-12.12.01 | UL 60079-18 | 2 | 2 | 1 or 2 |
| | Combustible Gas Detection System | ANSI/UL 2075; ANSI/ISA-60079-29-1 | UL 60079-29 | 1 or 2 | | |
| | Increased Safety | | UL 60079-7 | 1 or 2 | | |

Temperature Classification

| Type | Surface Temperature |
|------|---------------------|
| T1 | 450°C |
| T2 | 300°C |
| T3 | 200°C |
| T4 | 135°C |
| T5 | 100°C |
| T6 | 85°C |

* Temperature classification is based on the maximum surface temperature of the equipment in normal use

ATEX-IECEX

Polyamide cable protection: 40 years of experience in high quality solutions



- Products for the protection of cables, wires and hoses against not only mechanical damage but also the influences of UV radiation, weathering and chemicals
- Products made of specially modified, load discharging polyamide materials (PA12) for use in explosion endangered zones 1/2 (gas) and 21/22 (dust)
- Identical in function to the standard product range PMAFIX/PMAFLEX (since more than 40 years successfully used in applications as railway, machinery, automation, etc.)
- Sealing system fulfilling IP68
- System safety: For security reasons re-opening is only possible with the use of a screwdriver
- Flexible conduits, excellent for applications with continual reversed bending
- Quick and simple installation, reduced total installation costs (compared to other explosion-proof cable protection systems)
- No corrosion, long service life

ATEX/IECEX marking:

CE 1258



II 2G Ex eb IIC Gb
II 2D Ex tb IIIC Db
SEV 15 ATEX 0121X,
IECEX SEV 15.0009X

A pioneering technology leader, ABB is focused on providing solutions that address the critical issues in every area of operations, allowing customers to focus on plant sustainability, cost, quality, flexibility, safety and regulatory challenges. Therefore ABB provides also a metallic conduit system portfolio for the hazardous areas. For more information see here: <http://new.abb.com/low-voltage/products/conduit-fittings/kopex-ex/ex-metallic-conduit-systems>

COMPLETE CABLE PROTECTION SOLUTIONS

ABB is focused on providing solutions that address the critical issues in every area of operations, allowing customers to focus on plant sustainability, cost, quality, flexibility, safety and regulatory challenges.



Flexible non-metallic nylon conduit systems for hazardous areas

Selection guide

— Selection guide



| Type | XESX Nylon conduit | NENV Straight Nylon fittings | NEIR Nylon straight conduit female thread | NENZ Straight Nylon fittings with strain relief | NEAV Nylon 45° elbow fittings | NEBV Nylon 90° curved elbow fittings |
|------------------------|--------------------|------------------------------|---|---|-------------------------------|--------------------------------------|
| Approvals | | | | | | |
| ATEX | • | • | • | • | • | • |
| IEC / IECx | • | • | • | • | • | • |
| CSA / UL | – | – | – | – | – | – |
| UL | – | – | – | – | – | – |
| EAC Ex | • | • | • | – | – | – |
| INMETRO | • | • | • | – | – | – |
| CNEX | • | • | • | – | – | – |
| Protection Type | | | | | | |
| Ex eb | • | • | • | • | • | • |
| Ex d | – | – | – | – | – | – |
| Ex de | – | – | – | – | – | – |
| Ex tb | • | • | • | • | • | • |
| Zones | | | | | | |
| Zone 1 | • | • | • | • | • | • |
| Zone 2 | • | • | • | • | • | • |
| Zone 21 | • | • | • | • | • | • |
| Zone 22 | • | • | • | • | • | • |
| Page No. | 21 | 23 | 23 | 24 | 24 | 25 |



| NEWV Nylon 90° elbow fitting fittings | BENRRE Nylon Corrugated conduit to rigid metal pipe connection | BESGR Nylon Splice connector fittings | BEYR Nylon 'Y' piece fittings | BETR Nylon 'T' piece adapter | BEAVR Nylon conduit fittings | BEH Nylon conduit clip | GMM Hex Locknut |
|---|--|---|-------------------------------------|------------------------------------|---------------------------------|---------------------------|--------------------|
| • | • | • | • | • | • | • | - |
| • | • | • | • | • | • | • | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| • | • | • | • | • | • | • | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| • | • | • | • | • | • | • | - |
| • | • | • | • | • | • | • | • |
| • | • | • | • | • | • | • | • |
| • | • | • | • | • | • | • | • |
| • | • | • | • | • | • | • | • |
| 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 |



Non-metallic nylon conduit

XESX Range - Anti-static nylon multilayer conduit



Features

- For applications with high mechanical loads in explosion endangered areas classified as zones 1/2 and 21/22 (acc. to ATEX 137)
- For use at low temperatures
- Free from halogens, REACH + ROHS compliant
- No corrosion
- Excellent flexibility and high compression strength
- Multilayer material combination for improved product performance
- Vibration resistance

XESX Range

Approvals & certifications



Standards

| | |
|--|---|
| EC Type examination certificate to: | ATEX: Baseefa 08 ATEX 0003X / SEV 15ATEX0121X |
| | IECEX: IECEX BAS08.0001X/SEV 15.0009X |
| | Ex eb IIC Gb |
| | Ex tb IIIC Db |
| Operating temperature: | -40°C to +85°C |
| IP test: | IP66 |
| Compatible with: | KOPEX-Ex EXPQ and Nylon Fittings |
| Material: | Anti-Static Nylon 12 |
| Colour: | Black / Yellow inside |

XESX Anti-static nylon multilayer conduit

| Type | Conduit Size NW (mm) | Conduit Size Metric (mm) | Outside Diameter (mm) | Coil Length (m) |
|-------------|----------------------|--------------------------|-----------------------|-----------------|
| XESX0250 | 10 | 12 | 12.8 | 50 |
| XESX0350 | 12 | 16 | 15.6 | 50 |
| XESX0450 | 17 | 20 | 21 | 50 |
| XESX0550 23 | 23 | 25 | 28.5 | 50 |
| XESX0650 | 29 | 32 | 34.4 | 50 |
| XESX0730 | 36 | 40 | 42.4 | 30 |
| XESX0830 | 48 | 50 | 54.4 | 30 |



stat. R = lowest recommended bending radius for static (fixed) installation
 dyn. R = lowest recommended bending radius for dynamic (flexible) installation



Fine profile T
Tight bending radius



Coarse profile G
High pull-out strength

Non-metallic nylon conduit system

Nylon fittings for XESX conduit

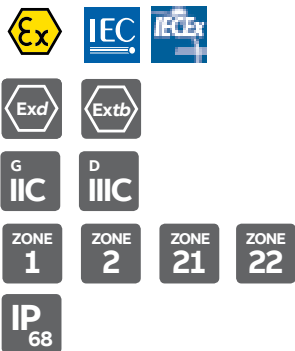


Features and benefits:

- For applications with high mechanical loads in explosion endangered areas classified as zones 1/2 and 21/22 (acc. to ATEX 137)
- For use at low temperatures
- Free from halogens, REACH + ROHS compliant
- No corrosion
- Excellent flexibility and high compression strength
- Multilayer material combination for improved product performance
- Vibration resistance

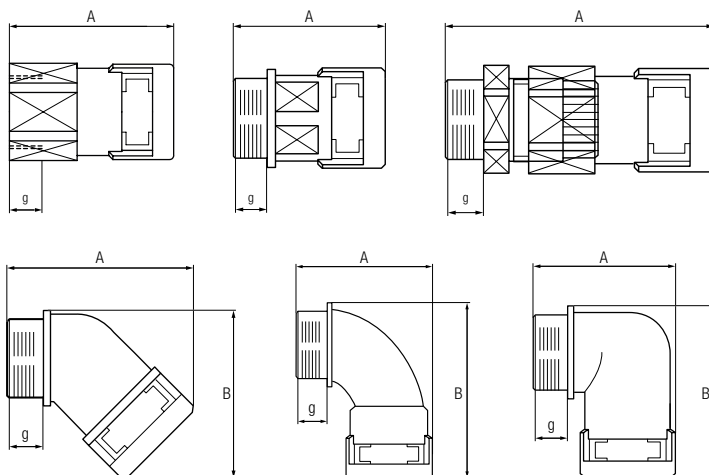
XESX Range

Approvals & certifications



Standards

| | |
|--|---------------------------------------|
| EC Type examination certificate to: | ATEX: SEV15ATEX0121 X |
| | IECEX: IECEX BAS08.0001X/SEV 15.0009X |
| | Ex eb IIC Gb |
| | Ex tb IIIC Db |
| Safe operating temperature range: | NW 10-12/12-16mm -5°C to +85°C |
| | NW 17-48/21-54mm -20°C to + 85°C |
| IP test: | IP68 |



g = Thread length A = Overall length A x B = External dimensions

Non-metallic nylon conduit system

Nylon fittings for XESX conduit

Type NENV Straight male fitting

Material: Anti-Static Nylon 12 with nickel plated brass thread

| Part no. | Metric Thread Size (mm) | Fits to Conduit Size (mm) | | Thread Length (mm) | Overall Length (mm) |
|----------|-------------------------|---------------------------|--------|--------------------|---------------------|
| | | NW | Metric | | |
| NENV0202 | M12x1.5 | 10 | 12 | 10.0 | 40.0 |
| NENV0203 | M16x1.5 | 10 | 12 | 10.0 | 40.0 |
| NENV0303 | M16x1.5 | 12 | 16 | 10.0 | 43.0 |
| NENV0304 | M20x1.5 | 12 | 16 | 10.0 | 43.0 |
| NENV0404 | M20x1.5 | 17 | 20 | 10.0 | 51.0 |
| NENV0405 | M25x1.5 | 17 | 20 | 11.0 | 51.0 |
| NENV0505 | M25x1.5 | 23 | 25 | 11.0 | 52.0 |
| NENV0506 | M32x1.5 | 23 | 25 | 13.0 | 54.0 |
| NENV0606 | M32x1.5 | 29 | 32 | 13.0 | 56.0 |
| NENV0607 | M40x1.5 | 29 | 32 | 13.0 | 57.3 |
| NENV0707 | M40x1.5 | 36 | 40 | 13.0 | 71.4 |
| NENV0708 | M50x1.5 | 36 | 40 | 14.0 | 72.4 |
| NENV0808 | M50x1.5 | 48 | 50 | 14.0 | 72.4 |
| NENV0809 | M63x1.5 | 48 | 50 | 14.0 | 72.4 |



Type NEIR Straight female fitting

Material: Anti-Static Nylon 12 with nickel plated brass thread

| Part no. | Metric Thread Size (mm) | Fits to Conduit Size (mm) | | Thread Length (mm) | Overall Length (mm) |
|----------|-------------------------|---------------------------|--------|--------------------|---------------------|
| | | NW | Metric | | |
| NEIR0303 | M16x1.5 | 12 | 16 | 9.0 | 41.0 |
| NEIR0404 | M20x1.5 | 17 | 20 | 10.0 | 50.0 |
| NEIR0505 | M25x1.5 | 23 | 25 | 10.0 | 56.0 |
| NEIR0606 | M32x1.5 | 29 | 32 | 11.0 | 55.5 |
| NEIR0707 | M40x1.5 | 36 | 40 | 13.0 | 71.0 |
| NEIR0808 | M50x1.5 | 48 | 50 | 15.0 | 73.0 |




Non-metallic nylon conduit system

Nylon fittings for XESX conduit

Type NENZ Straight male fitting with strain relief


Material: Anti-Static Nylon 12 with nickel plated brass thread

| | Part no. | Metric Thread Size (mm) | Fits to Conduit Size (mm) | | Terminal Range | Thread Length (mm) | Overall Length (mm) |
|---|--------------|-------------------------|---------------------------|-------------|----------------|--------------------|---------------------|
| | | | NW | Metric | | | |
|  | NENZ0202S/P1 | M16x1.5 | 10 | 12 | 4.0 – 6.5 | 5.0 | 48.5 |
| | NENZ0203S/P1 | M16x1.5 | 10 | 12 | 4.0 – 6.5 | 6.0 | 49.5 |
| | NENZ0203S/P2 | M16x1.5 | 10 | 12 | 5.0 – 8.0 | 6.0 | 49.5 |
| | NENZ0203S/P3 | M16x1.5 | 10 | 12 | 6.5 – 9.5 | 6.0 | 49.5 |
| | NENZ0304S/P1 | M20x1.5 | 12 | 16 | 4.0 – 6.5 | 6.5 | 54.0 |
| | NENZ0304S/P3 | M20x1.5 | 12 | 16 | 6.5 – 9.5 | 6.5 | 54.0 |
| | NENZ0304S/P4 | M20x1.5 | 12 | 16 | 7.0 – 10.5 | 6.5 | 54.0 |
| | NENZ0404S/P3 | M20x1.5 | 17 | 20 | 6.5 – 9.5 | 6.5 | 60.0 |
| | NENZ0404S/P4 | M20x1.5 | 17 | 20 | 7.0 – 10.5 | 6.5 | 60.0 |
| | NENZ0404S/P5 | M20x1.5 | 17 | 20 | 9.0 – 13.0 | 6.5 | 60.0 |
| | NENZ0405S/P5 | M25x1.5 | 17 | 20 | 9.0 – 13.0 | 7.5 | 61.5 |
| | NENZ0405S/P6 | M25x1.5 | 17 | 20 | 11.5 – 15.5 | 7.5 | 61.5 |
| | NENZ0505S/P6 | M25x1.5 | 23 | 25 | 11.5 – 15.5 | 7.5 | 72.5 |
| | NENZ0606S/P3 | M32x1.5 | 29 | 32 | 17.0 – 20.5 | 8.0 | 73.0 |
| | NENZ0606S/P4 | M32x1.5 | 29 | 32 | 20.0 – 25.0 | 8.0 | 73.0 |
| | NENZ0607S/P5 | M40x1.5 | 29 | 32 | 24.0 – 28.0 | 8.0 | 73.0 |
| | NENZ0707S/P1 | M40x1.5 | 36 | 40 | 20.0 – 25.0 | 9.0 | 87.0 |
| | NENZ0707S/P2 | M40x1.5 | 36 | 40 | 24.0 – 28.0 | 9.0 | 87.0 |
| | NENZ0708S/P3 | M50x1.5 | 36 | 40 | 32.0 – 36.0 | 10.0 | 89.5 |
| | NENZ0808S/P2 | M50x1.5 | 48 | 50 | 32.0 – 36.0 | 10.0 | 92.0 |
| NENZ0808S/P3 | M50x1.5 | 48 | 50 | 36.0 – 40.0 | 10.0 | 92.0 | |

*Other clamping ranges and multiple hole sealing inserts available on request.

Type NEAV 45° Elbow fitting

Material: Anti-Static Nylon 12 with nickel plated brass thread

| | Part no. | Metric Thread Size (mm) | Fits to Conduit Size (mm) | | Thread Length (mm) | External Dimensions (mm) |
|---|----------|-------------------------|---------------------------|--------|--------------------|--------------------------|
| | | | NW | Metric | | |
|  | NEAV0303 | M16x1.5 | 12 | 16 | 10.0 | 53.0 x 40.5 |
| | NEAV0404 | M20x1.5 | 17 | 20 | 10.0 | 60.5 x 51.5 |
| | NEAV0505 | M25x1.5 | 23 | 25 | 11.0 | 70.0 x 60.5 |
| | NEAV0606 | M32x1.5 | 29 | 32 | 13.0 | 77.0 x 68.0 |
| | NEAV0707 | M40x1.5 | 36 | 40 | 13.0 | 94.0 x 87.5 |
| | NEAV0808 | M50x1.5 | 48 | 50 | 14.0 | 102.0 x 101.0 |
| | NEAV0809 | M63x1.5 | 48 | 50 | 14.0 | 102.0 x 104.0 |

Non-metallic nylon conduit system

Nylon fittings for XESX conduit

Type NEBV 90° Curved elbow fitting

Material: Anti-Static Nylon 12 with nickel plated brass thread

| Part no. | Metric Thread Size (mm) | Fits to Conduit Size (mm) | | Thread Length (mm) | External Dimensions (mm) |
|----------|-------------------------|---------------------------|--------|--------------------|--------------------------|
| | | NW | Metric | | |
| NEBV0404 | M20x1.5 | 17 | 20 | 10.0 | 51.0 x 73.0 |
| NEBV0505 | M25x1.5 | 23 | 25 | 11.0 | 62.5 x 85.0 |
| NEBV0606 | M32x1.5 | 29 | 32 | 13.0 | 74.0 x 94.5 |
| NEBV0707 | M40x1.5 | 36 | 40 | 13.0 | 86.5 x 123.0 |
| NEBV0808 | M50x1.5 | 48 | 50 | 14.0 | 100.5 x 135.0 |
| NEBV0809 | M63x1.5 | 48 | 50 | 14.0 | 100.5 x 138.0 |



Type NEWV 90° elbow fitting

Material: Anti-Static Nylon 12 with nickel plated brass thread

| Part no. | Metric Thread Size (mm) | Fits to Conduit Size (mm) | | Thread Length (mm) | External Dimensions (mm) |
|----------|-------------------------|---------------------------|--------|--------------------|--------------------------|
| | | NW | Metric | | |
| NEWV0303 | M16x1.5 | 12 | 16 | 10.0 | 42.0 x 46.5 |



Type BENRRE Corrugated conduit to rigid metal pipe connection

Material: Anti-Static Nylon 12, Stainless Steel Jubilee Clip

| Part no. | Fits to Conduit Size (mm) | | Steel Tube Metric (mm) | Inside Diameter (mm) | Overall Length (mm) |
|--------------|---------------------------|--------|------------------------|----------------------|---------------------|
| | NW | Metric | | | |
| BENRRE030324 | 12 | 16 | M16 | 16.0 | 54.0 |
| BENRRE040428 | 17 | 20 | M20 | 20.0 | 65.0 |
| BENRRE050532 | 23 | 25 | M25 | 25.0 | 71.0 |
| BENRRE060644 | 29 | 32 | M32 | 32.0 | 71.0 |
| BENRRE070750 | 36 | 40 | M40 | 40.0 | 90.0 |
| BENRRE080865 | 48 | 50 | M50 | 50.0 | 90.0 |




Non-metallic nylon conduit system

Nylon fittings for XESX conduit


Type BESGR Splice connector

Material: Anti-Static Nylon 12

| | Part no. | Fits to Conduit Size (mm) | | Inside Diameter (mm) | Overall Length (mm) |
|---|-----------|---------------------------|--------|----------------------|---------------------|
| | | NW | Metric | | |
|  | BESGR0303 | 12 | 16 | 23.5 | 66.0 |
| | BESGR0404 | 17 | 20 | 29.5 | 87.0 |
| | BESGR0505 | 23 | 25 | 37.0 | 103.0 |
| | BESGR0606 | 29 | 32 | 44.0 | 100.0 |
| | BESGR0707 | 36 | 40 | 53.5 | 130.0 |
| | BESGR0808 | 48 | 50 | 66.0 | 133.0 |

Type BEYR 'Y' Piece


Material: Anti-Static Nylon 12

| | Part no. | 1 x Conduit Size (mm) | | 2 x Conduit Size (mm) | |
|---|------------|-----------------------|--------|-----------------------|--------|
| | | NW | Metric | NW | Metric |
|  | BEYR030202 | 12 | 16 | 10 | 12 |
| | BEYR040303 | 17 | 20 | 12 | 16 |
| | BEYR050404 | 23 | 25 | 17 | 20 |
| | BEYR060505 | 29 | 32 | 23 | 25 |
| | BEYR070606 | 36 | 40 | 29 | 32 |
| | BEYR080707 | 48 | 50 | 36 | 40 |

*Sizes can be adapted with EAVR conduit adapters to fit smaller conduit dimensions.

Type BETR 'T' Piece

Material: Anti-Static Nylon 12

| | Part no. | 2 x Conduit Size (mm) | |
|---|------------|-----------------------|--------|
| | | NW | Metric |
|  | BETR020202 | 10 | 12 |
| | BETR030303 | 12 | 16 |
| | BETR040404 | 17 | 20 |
| | BETR050505 | 23 | 25 |
| | BETR060606 | 29 | 32 |
| | BETR070707 | 36 | 40 |
| | BETR080808 | 48 | 50 |


*Sizes can be adapted with EAVR conduit adapters to fit smaller conduit dimensions.

Non-metallic nylon conduit system

Nylon fittings for XESX conduit


Type BESGR Conduit adapter

Material: Anti-Static Nylon 12

| | Part no. | Fits into Fitting for Conduit Size (mm) | | Fits to Conduit Size (mm) | | Overall Length (mm) |
|---|------------|---|--------|---------------------------|--------|---------------------|
| | | NW | Metric | NW | Metric | |
|  | BEAVR03/02 | 12 | 16 | 10 | 12 | 46.0 |
| | BEAVR04/03 | 17 | 20 | 12 | 16 | 54.0 |
| | BEAVR05/04 | 23 | 25 | 17 | 20 | 62.0 |
| | BEAVR06/05 | 29 | 32 | 23 | 25 | 64.0 |
| | BEAVR07/06 | 36 | 40 | 29 | 32 | 81.0 |
| | BEAVR08/07 | 48 | 50 | 36 | 40 | 88.5 |


Type BEH Conduit clip

Material: Anti-Static Nylon 12

| | Part no. | Fits to Conduit Size (mm) | | | Fixing Screw |
|---|----------|---------------------------|--------|-----------------------------|--------------|
| | | NW | Metric | Width x Height x Depth (mm) | |
|  | BEH02 | 10 | 12 | 20.5 x 24.5 x 20.0 | 1 x M5 |
| | BEH03 | 12 | 16 | 24.0 x 27.0 x 20.0 | 1 x M5 |
| | BEH04 | 17 | 20 | 30.0 x 34.0 x 20.0 | 1 x M6 |
| | BEH05 | 23 | 25 | 38.5 x 42.0 x 20.0 | 1 x M6 |
| | BEH06 | 29 | 32 | 45.5 x 48.0 x 20.0 | 1 x M6 |
| | BEH07 | 36 | 40 | 55.5 x 56.0 x 20.0 | 1 x M6 |
| | BEH08 | 48 | 50 | 67.5 x 68.0 x 20.0 | 1 x M6 |

GMM Hex Locknut

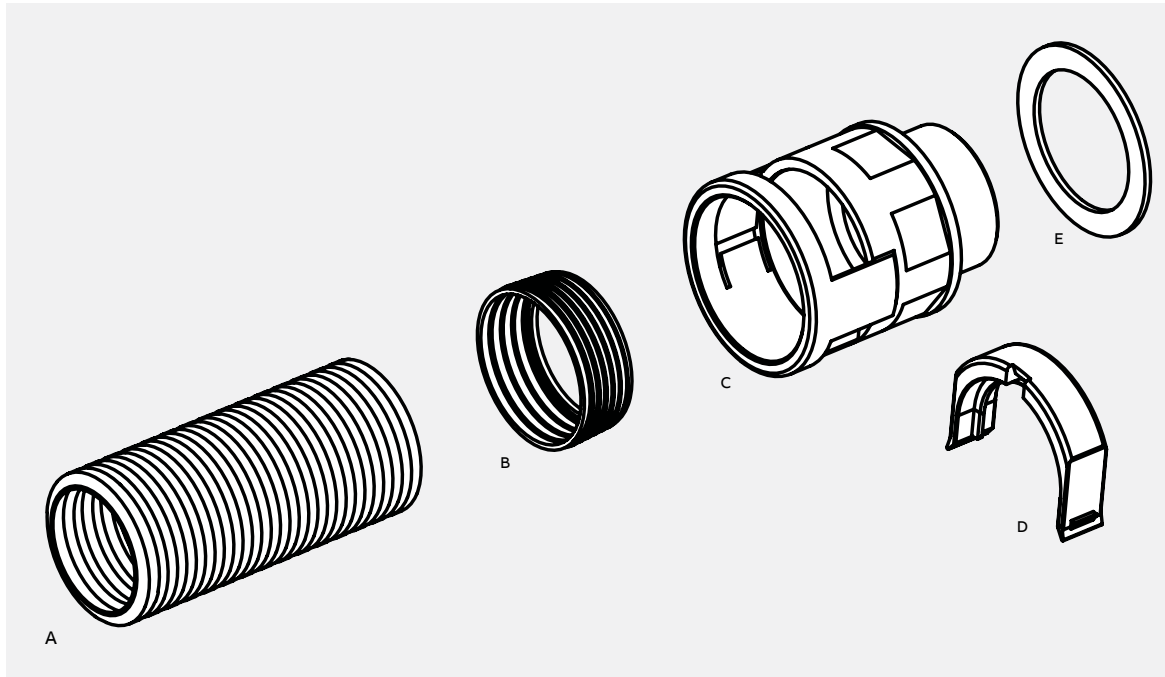
Material: Nickel plated/Brass

| | Part no. | Fits to Thread | | Height (min.) mm |
|---|----------|----------------|-------------|---------------------|
| | | Metric (mm) | Wrench size | |
|  | GMM-M12 | M12x1.5 | 15 | 2.8 |
| | GMM-M16 | M16x1.5 | 19 | 2.8 |
| | GMM-M20 | M20x1.5 | 24 | 3.0 |
| | GMM-M25 | M25x1.5 | 30 | 3.5 |
| | GMM-M32 | M32x1.5 | 36 | 4.0 |
| | GMM-M40 | M40x1.5 | 46 | 4.5 |
| | GMM-M50 | M50x1.5 | 60 | 5.0 |
| | GMM-M63 | M63x1.5 | 70 | 5.5 |

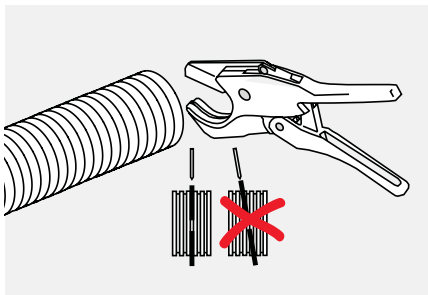
Easy installation

with highest assembly reliability

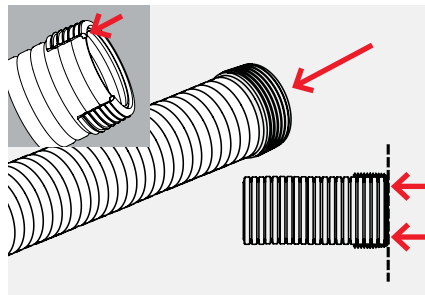
- A. Conduit
- B. Ex Seal cap (yellow)
- C. Fitting
- D. Oval clip
- E. Thread seal



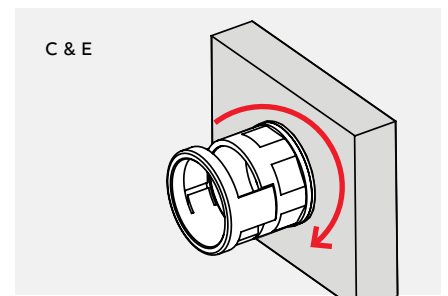
Installation of IP68 safety system (pat.)



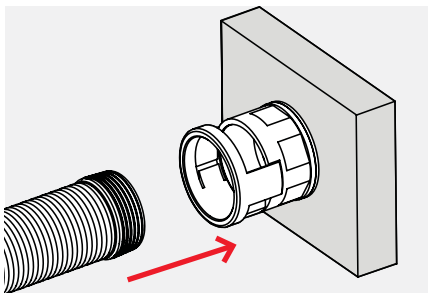
01. Straight cut of conduit



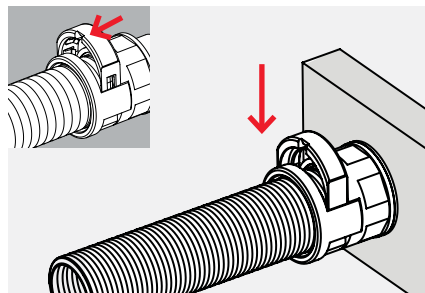
02. Push seal cap (B) completely onto conduit in order to achieve IP68.



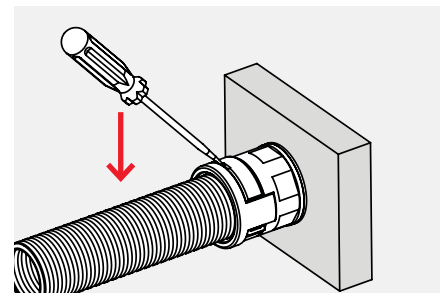
03. Place seal (E) onto fitting thread (C) and screw in.



04. Push conduit with seal cap (A+B) into the fitting until seal cap is no more visible in the locking element window.



05. Insert oval clip (D) in the locking element window and click into place. The screwdriver slot must point towards the conduit. To re-open use a screwdriver.



Area of application

The products constitute an equipment group II category 2G device in accordance with Directive 2014/34/EU (ATEX 114) Appendix I which may be implemented in zones 1 / 2 as well as in gas groups IIA, IIB and IIC which are subject to explosion risk due to combustible substances, in accordance with Directive 99/92/EC (ATEX 137). The requirements in accordance with EN 60079-14 shall be adhered to on use/installation.

The products constitute an equipment group II category 2D device in accordance with Directive 2014/34/EU (ATEX 114) Appendix I which may be implemented in zones 21 / 22 with explosive air/dust mixtures in accordance with Directive 99/92/EC (ATEX 137). The requirements in accordance with EN 60079-14 shall be adhered to on use/installation.

Operation, service, maintenance

The defined ambient and operating temperature range in accordance to EN 60079-0 is:

–40 °C to +85 °C in combination with

Kopex-Ex EXPQ fitting

–20 °C to +85 °C in combination with

PMA NW17-48 fittings

–5 °C to +85 °C in combination with

PMA NW10-12 fittings

A visual examination of the cable protection system shall be performed in periodic maintenance of systems and components, but no later than every 5 years. In the event of visible damage (holes, cracks, signs of heavy wear) to conduits, fittings or accessories, the damaged parts shall be replaced. (In the event of apparent mechanical damage, it shall be ensured that no incorrect handling takes place.)

Only ATEX-IECEx approved original PMA parts shall be used for the replacement of ATEX-IECEx approved parts.

Assembly

To ensure the discharge of electrical currents and thus to ensure antistatic behaviour, ATEX/IECEx approved PMA conduits shall be used exclusively in combination with special PMA connectors and accessories which are also ATEX/IECEx approved. These connectors and accessories (seals, fasteners) are also made of discharging material and are designated with the conformity marking.

The ATEX/IECEx approved connectors or accessories shall always be in direct contact with a metallic surface (ground). No insulating materials (e.g. adhesives) and no components which are not ATEX/IECEx approved shall be used between the discharging plastic parts or between plastic parts and metal surfaces.

Chemical resistance guide

This document serves as a guideline only and compatibility should be verified in the application environment to ensure suitability. Many factors can determine the exact suitability; such as temperature, duration of contact, nature of contact such as submersion and concentration of the chemicals involved.

| Resistance guide | Chemical Formula | PA12 Polyamide 12 |
|--|------------------|-------------------|
| Chemicals | | |
| 3 = Excellent resistance / suitable for permanent contact 2 = Resistant / suitable for occasional contact 1 = Relatively resistant / suitable for short-term contact 0 = Not recommended - = No data * = Synthetic additives can affect the oil resistance of plastics. Please contact PMA for further information. | | |
| Acetic acid (10%) | C2H4O2 | 2 |
| Acetone | C3H6O | 3 |
| Ammonia (30%) | NH3 | 3 |
| Benzene | - | 3 |
| Brake fluid | - | 3 |
| Caustic soda | HNaO | 3 |
| Ethyl alcohol (40%) | C2H6O | 3 |
| Glycol | C2H6O2 | 2 |
| Hydrochloric acid (10%) | HCL | 1 |
| Methanol | CH4O | 3 |
| Methyl ethyl ketone | C4H8O | 3 |
| Nitric acid (10%) | HNO3 | 0 |
| Ozone | O3 | 2 |
| Paint thinner | - | 3 |
| Perchloroethylene | C2Cl4 | 2 |
| Paraffin | - | 3 |
| Phosphoric acid (10%) | H3O4P | 2 |
| Sea water | - | 3 |
| Soap solution | - | 3 |
| Sodium chloride | NaCl | 3 |
| Sulphuric acid (10%) | H2SO4 | 2 |
| Toluene | C7H8 | 3 |
| Trichloroethylene | C2HCl3 | 2 |
| Turpentine | - | 3 |
| Urine | - | 3 |
| Resistance Against Oils and Greases | | |
| Cutting oils* | - | 2 |
| Diesel oil | - | 3 |
| ASTM Oil Nr. 3 | - | 3 |
| Fuel oil | - | 3 |
| Hydraulic oils* | - | 3 |
| Mineral oils | - | 3 |
| Spark-erosion liquids | - | 3 |
| Skydrol | - | 2 |
| Transformer oils* | - | 3 |

Important:

The chemical resistance of plastic products is also dependant on factors such as temperature, amount of time exposed to chemicals (e.g. occasional contact or immersed) as well as the concentration of the specific chemicals. The stated chemical resistances are valid for a temperature of 20 °C. The chemical resistance table above serves only as a guide for the use of polyamide products in conjunction with the listed chemicals. Each specific application should be controlled for suitability by the end-user. A more detailed table can be found on the PMA Homepage under www.pma.ch.

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Additional information

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