



Product Catalogue

PMA Ex-System

ATEX-IECEx approved flexible nonmetallic
cable protection solution
for hazardous areas

PMA

ABB

PMA Ex-System
ATEX-IECEX approved cable protection system

Introduction

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Flexible conduit systems

2

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Introduction

Low voltage products for hazardous areas

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At ABB, our focus is on improving your business performance by providing practical, reliable electrical products & services. To connect & protect for life. To solve everyday problems in the area's of Wire & Cable Management, Cable Protection, Power Connection & Control and Safety.

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



Introduction

Food & Beverage applications

1



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.

Introduction

Chemical & Pharmaceutical applications



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.

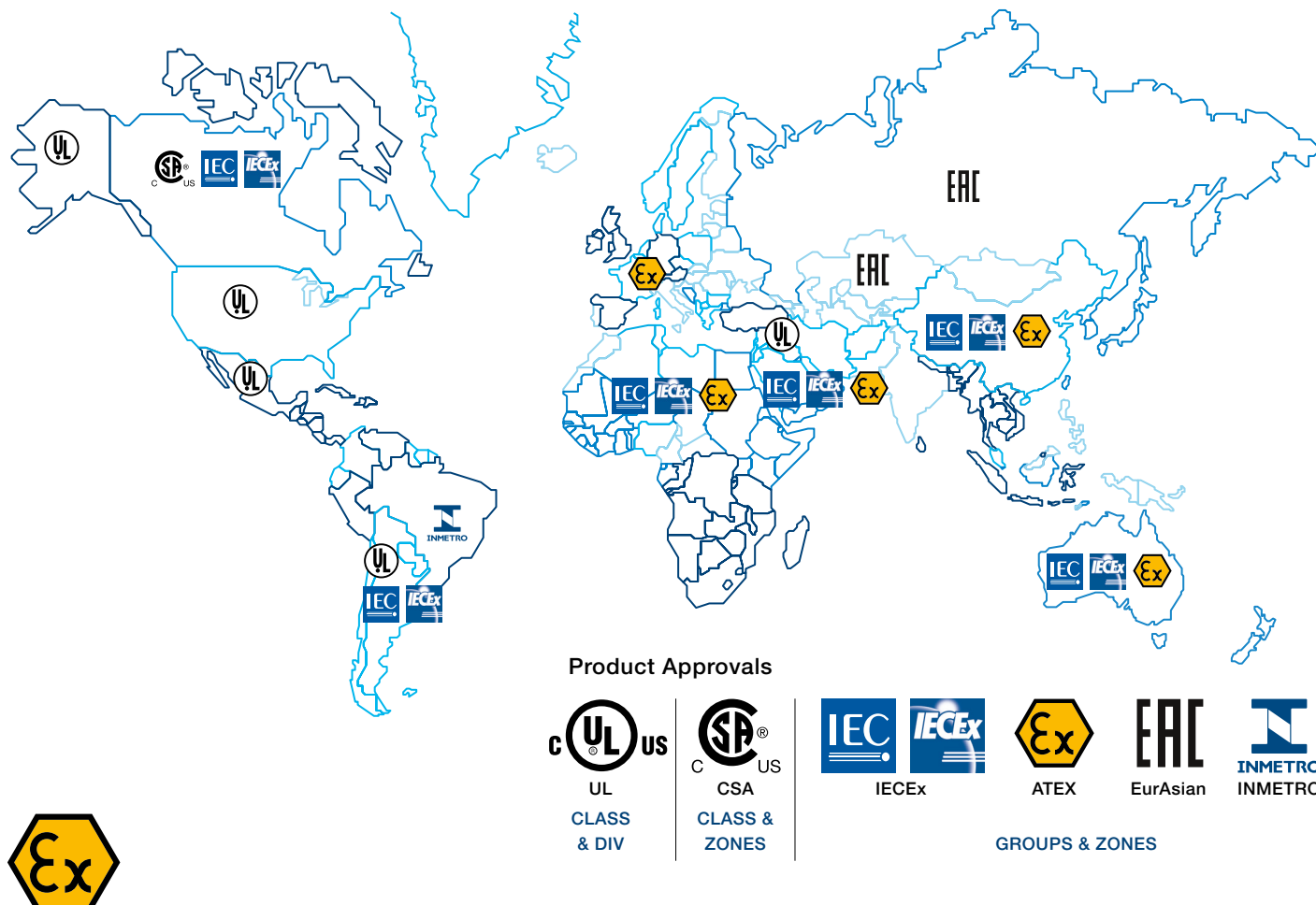
Standards, zone definitions & product markings

World standards & what they mean

1

World standards and what they mean.

In this Section we will outline the different Standards used throughout the world and what it means for products specified for use in Hazardous Areas. Below is a map of the world which illustrates the Standards that are generally used in these regions.



The ATEX Europe Directives

ATEX requires employers to eliminate or control risks from dangerous substances and to classify areas where explosive atmospheres may occur into zones, as laid down in regulations. ATEX Directives are designed to protect employees, the public and the environment from accidents owing to explosive atmospheres and since July 1st 2006 all existing sites, as well as new sites, must be fully ATEX compliant.

Directive 2014/34/EU (ATEX 114) applies to equipment suppliers and manufacturers and 99/92/EC (ATEX 137) applies to end users. These directives complement each other, but have different purposes. ATEX covers both electrical and non-electrical products intended for use in hazardous areas, including mechanical equipment.

The Directive ATEX 114 came into existence in 2014 and products sold within the European Union designed for use in hazardous areas must have ATEX certification and bear the ATEX marking on the product or on a certificate plate. The obligation is placed upon the manufacturer or supplier of the product and the intention is to facilitate free movement of goods within the EU.

Declaration of Conformance

This has to be issued by the supplier for every order which is to be installed in a hazardous area. This document has to show that the equipment supplied complies with the latest harmonized standard.

Standards, zone definitions & product markings

World standards & what they mean



IECEx (International Scheme)

The IECEx scheme is an international certificate of conformance for products used in a hazardous area.

This scheme provides:

- a) A single certification of conformity for manufacturers to comply that includes:
- b) Testing and assessment of products to a standard including a full test report.
- c) Ongoing surveillance of manufacturers premises.
- d) A fast-track process for countries where regulations still require the issuing of national Ex certificates or approvals.

This scheme is in the process of being adopted by all the known standards across the world but are all working to various time scales.



UL (America) & CSA (Canada)

The American and Canadian standards are the only ones to have different classifications and locations. ATEX & IECEx work to Groups and Zones whereas the NEC & CEC works to Classes and Divisions, there is no direct comparison between the two. This means that it is imperative that the two standards are not inter-changed within an area.



EurAsian Conformity Mark (Customs Union)

EurAsian Conformity Mark follows similar rules to that of IECEx as far as the breakdown of the zones and other criteria are concerned.

EurAsian Conformity Mark is the standard for the Customs Union which includes the Russian Federation, Kazakhstan and Belarus.

Electrical materials for use in potentially explosive atmospheres must conform to two major certification standards: IEC/CENELEC and NEC

The IEC (International Electrotechnical Commission) standards are accepted in practically all countries. They are identical to the European CENELEC standards.

The NEC (National Electrical Code) is mandatory in the United States. The 1996 version, art. 505, takes up the IEC designations for gas, temperature classes for materials and zone definition.

Gases and vapours classification

Gases are divided into four groups in the NEC (National Electrical Code) and three groups for IEC/CENELEC. The groups display the same hierarchy of classification of gases and vapour (See table on page 1/12).

Temperature classification

The IEC and the NEC have also defined a temperature classification for material used in zones at risk of explosion (See table on page 1/13).



Standards, zone definitions & product markings

Zone definitions - Onshore gases & vapours

1

ZONE
0

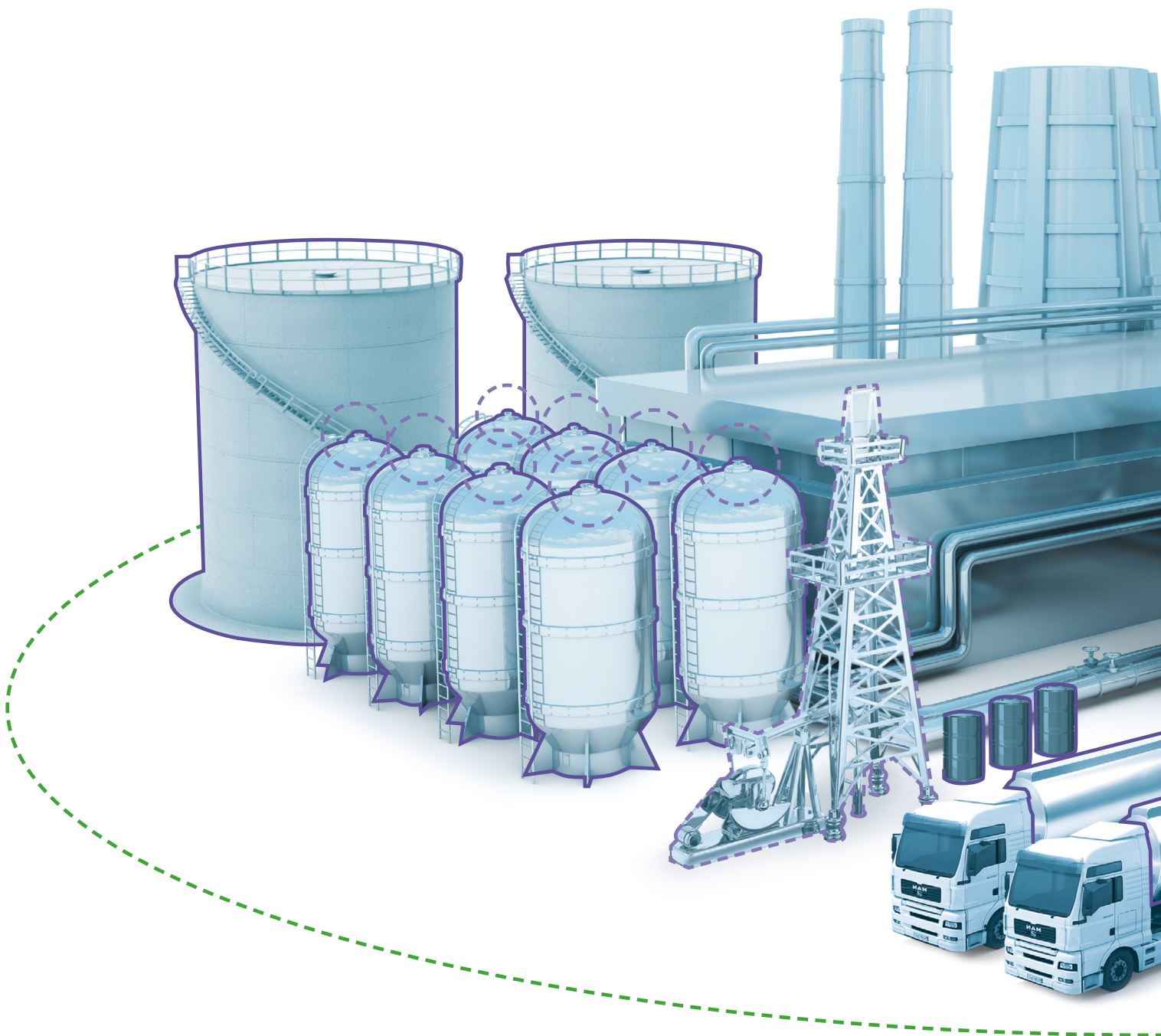
Zone 0 ———
Permanent / Frequent

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

ZONE
1

Zone 1 - - -
Occasional

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



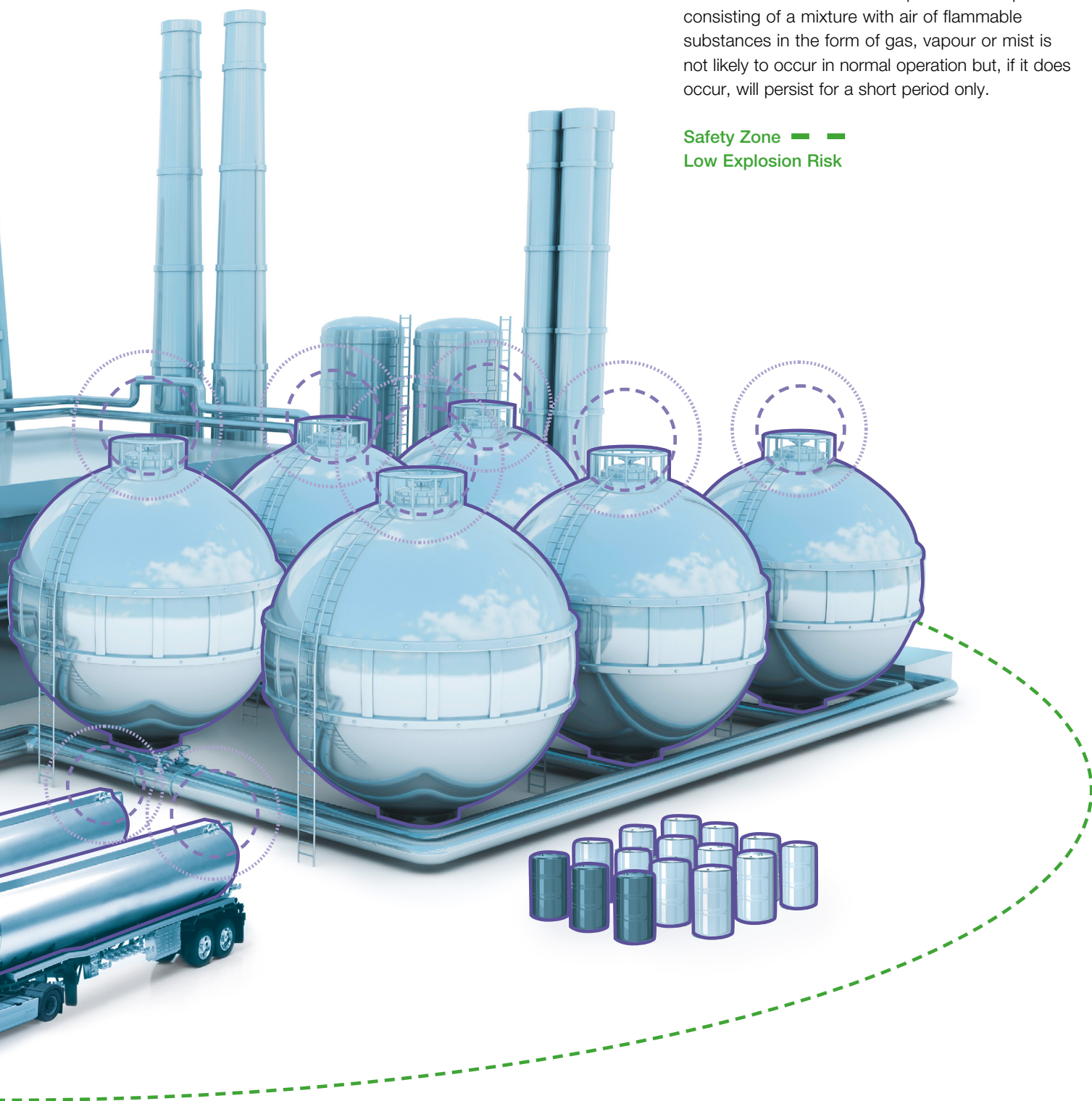
**ZONE
2**

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, vapour 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 & vapours

1

ZONE
0

Zone 0 ——— **Permanent / Frequent**

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

Safety Zone ———
Low Explosion Risk

ZONE
1

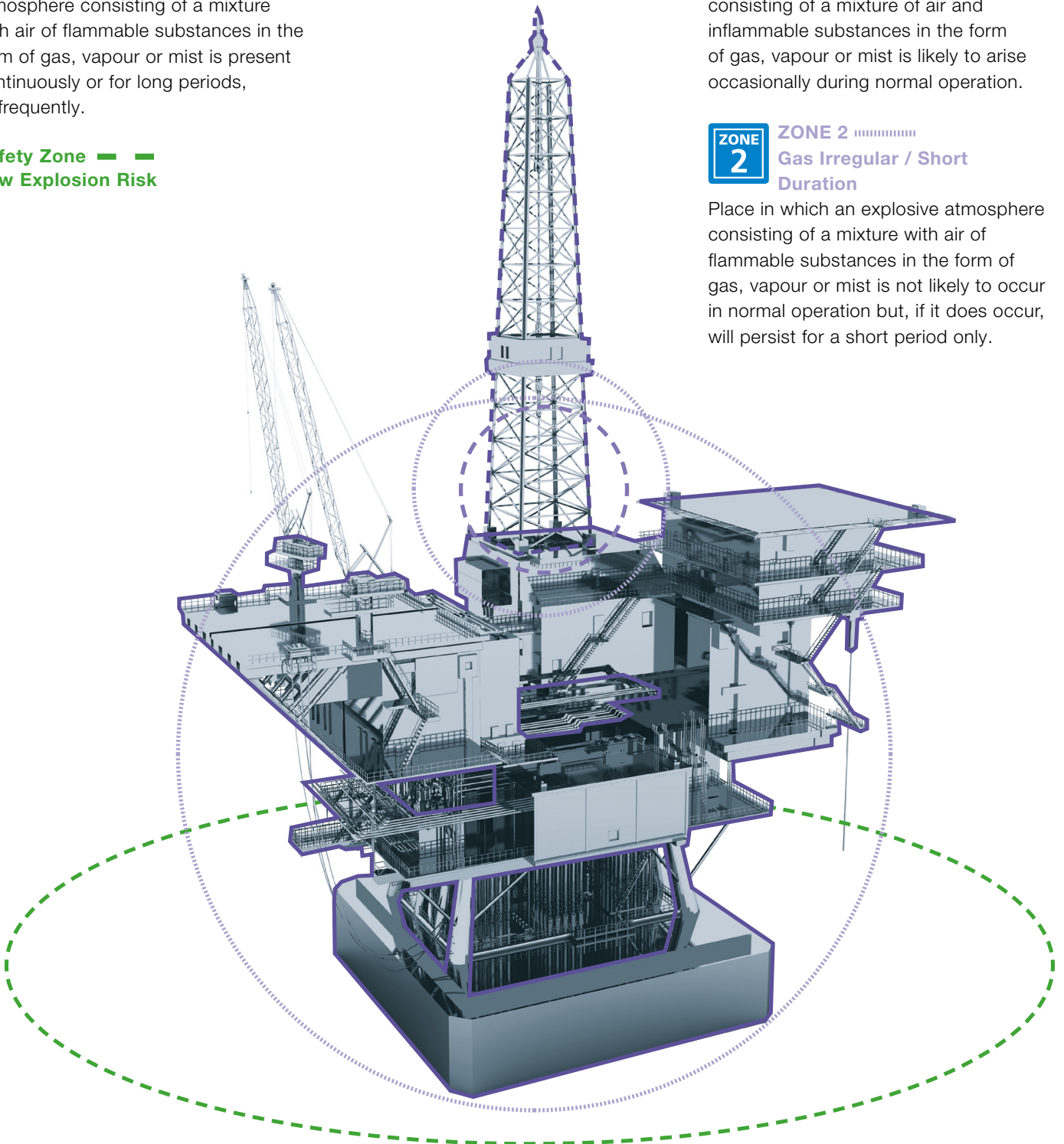
Zone 1 ——— **Occasional**

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

ZONE
2

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, vapour 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

1

ZONE
20

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

Zone 21 — — — Occasional

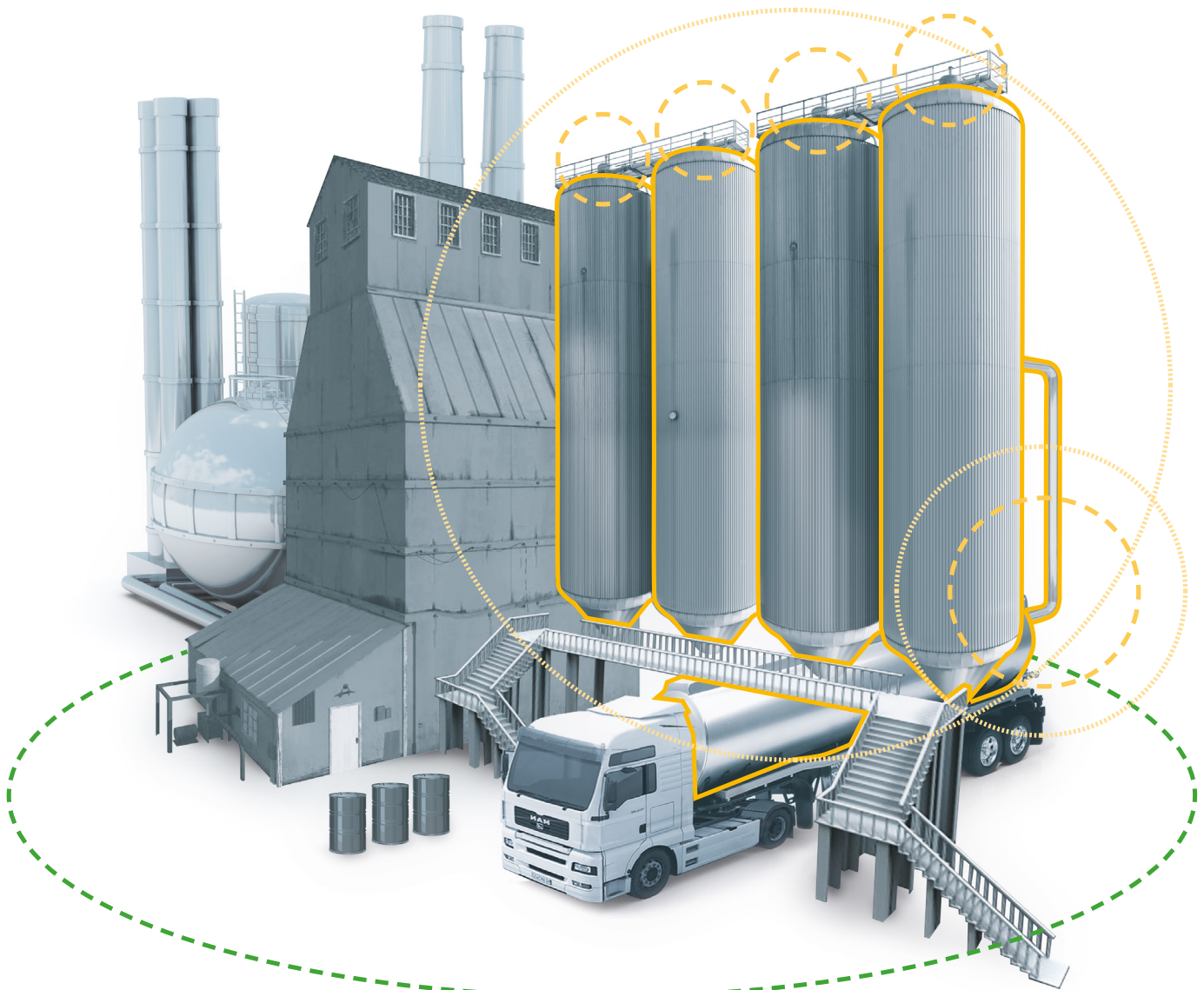
Area in which an explosive atmosphere, in the form of a cloud of combustible dust in air is likely to occur, occasionally, in normal operation, occasionally.

ZONE
22

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 — — —
Low Explosion Risk**



Standards, zone definitions & product markings

Product marking guide

1

Classifications of Hazardous Areas

Classifications of Hazardous Areas		Description	ATEX		EPL	Equipment Usage
			Group	Category		
Mining	Energised	Persistant risk of methane gas and other dusts	I	M1	Ma	
	De-energised		I	M2	Mb	
Gas Environments	Zone 0	Persistant and continuous presence of gas for frequent or long periods	II	1G	Ga	ATEX Equipment Category 1G , Equipment Protection Level Ga
	Zone 1	Likely occurrence of gas presence in normal operation	II	2G	Gb	ATEX Equipment Category 2G or higher , Equipment Protection Level Gb or higher
	Zone 2	Unlikely occurrence of gas presence in normal operation, short term persistence if any	II	3G	Gc	ATEX Equipment Category 3G , Equipment Protection Level Gc or higher
Dust Environments	Zone 20	Persistant and continuous presence of dust for frequent or long periods	II	1D	Da	ATEX Equipment Category 1D , Equipment Protection Level Da
	Zone 21	Likely occurrence of dust presence in normal operation	II	2D	Db	ATEX Equipment Category 2D or higher , Equipment Protection Level Db or higher
	Zone 22	Unlikely occurrence of dust presence in normal operation, short term persistence if any	II	3D	Dc	ATEX Equipment Category 3D or higher , Equipment Protection Level Dc or higher

Key

- Zone 0:  – Zone 20: 
- Zone 1:  – Zone 21: 
- Zone 2:  – Zone 22: 

Gas & Dust Groups

Group	Typical			Examples
Mining	I			Methane (Mining only)
Gases		IIA	Propane	Ammonia, Methane Gasoline, Butane
		IIB	Ethylene	Town gas Acrylonitril
		IIB+H2	Hydrogen	
	IIIC		Hydrogen Acetylene	Carbon disulphide
Dusts		IIIA	Combustable flyings	Wood shaving
		IIIB	Non-conductive dust	Saw dust, flour
	IIIC		Conductive dust	Metal dust

Protection Concepts

Protection Concepts	Primary	Type of Protection	EN/IEC Standard	Sub Concept	Gas Zones	Dust Zones
By Enclosure	Ex d	Flameproof	60079-1	Ex db	1	—
				Ex dc	2	—
	Ex t	Dust proof	60079-31	Ex ta	—	20
				Ex tb	—	21
				Ex tc	—	22
By Exclusion	Ex p	Pressurisation	60079-2	Ex pxb	1	21 / 22
				Ex pyb	1	
				Ex pzc	2	
	Ex m	Encapsulation	60079-18	Ex ma	0	20
				Ex mb	1	21
				Ex mc	2	22
	Ex o	Oil immersion	60079-6	Ex ob	1	—
	Ex q	Powder filling	60079-5	Ex qb	1	—
By Equipment	Ex i	Intrinsically safe	60079-11	Ex ia	0	20
				Ex ib	1	21
				Ex ic	2	22
	Ex op	Optical radiation	60079-28	Ex op is	0 / 1 / 2	20 / 21 / 22
				Ex op pr	1 / 2	21 / 22
				Ex op sh	0 / 1 / 2	20 / 21 / 22
	Ex e	Increased safety	60079-7	Ex eb	1	—
				Ex ec	2	—
	Ex n	Non sparking	60079-15	Ex nA	2	—
		Limited energy		Ex nL		
		Restricted breathing		Ex nR		
		Enclosed breaking		Ex nC		

Temperature Classification

Class*	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

Introduction

ATEX-IECEX

1



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. Therefor 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>

Flexible non-metallic nylon conduit systems for hazardous areas

Flexible Conduit Systems

Conduit fittings - Selection guide 2/2

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Type BETR - 'T' Piece	2/10
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Type GMM - Hex lock nut	2/11

2



Flexible non-metallic nylon conduit systems for hazardous areas

Conduit fittings - Selection guide

2



	Non-metallic nylon conduit	Nylon conduit fittings					
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	NEWV Nylon 90° elbow fittings
Approvals							
ATEX	•	•	•	•	•	•	•
IEC / IECEx	•	•	•	•	•	•	•
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	•	•	•	•	•	•	•
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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
•	•	•	•	•	•	—
•	•	•	•	•	•	—
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2/9	2/10	2/10	2/10	2/11	2/11	2/11

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

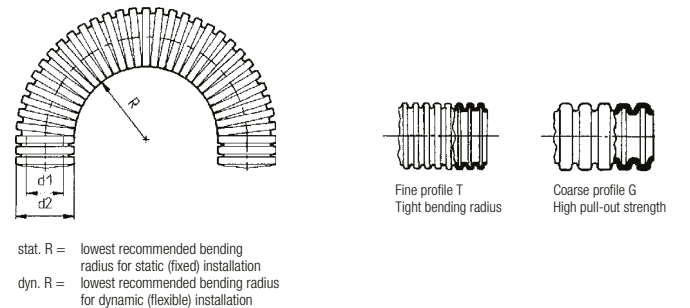
Certifications



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
Temperature range:	-40°C to +85°C
	RT1 110°C to EN60079-0
IP test:	IP68

Dimensional diagrams



Non-metallic nylon conduit

XESX Range - Anti-static nylon multilayer conduit



Type XESX
Anti-static nylon
multilayer conduit

XESX Range

Anti-Static Nylon Multilayer Conduit

Compatible with: KOPEX-Ex EXPQ and Nylon Fittings / **Materials:** Anti-Static Nylon 12 / **Colour:** ● Black / Yellow (inside)

Part No.	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	25	28.5	50
XESX0650	29	32	34.4	50
XESX0730	36	40	42.4	30
XESX0830	48	50	54.4	30

Non-metallic nylon conduit system

Nylon fittings for XESX conduit

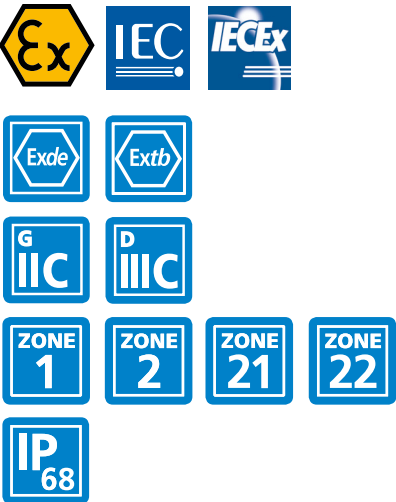
2



Features

- For indoor and outdoor applications IP68
- Content of delivery: Seal caps, oval locking clips and thread seals for male threads (O-ring and/or flat gasket)
- High thread and system connection strength
- Corrosion resistant
- Easy installation
- Very good chemical properties

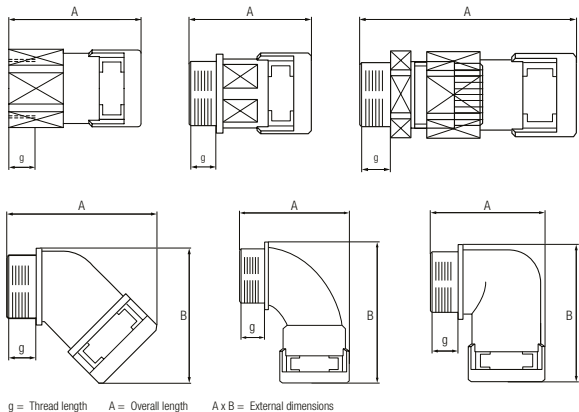
Certifications



Standards

EC Type examination certificate to:	ATEX: SEV15ATEX0121 X
	IECEx: IECEx SEV15.0009 X
	Ex eb IIC
	Ex tb IIIC
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

Dimensional diagrams



Non-metallic nylon conduit system

Nylon fittings for XESX conduit



Type NENV
Straight male fitting

Type NENV

Straight Male Conduit Fitting - Metric Thread / **Materials:** 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	52.0
NENV0505	M25x1.5	23	25	11.0	54.0
NENV0506	M32x1.5	23	25	13.0	56.0
NENV0606	M32x1.5	29	32	13.0	57.3
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

Type NEIR

Straight Female Conduit Fitting - Metric Thread / **Materials:** 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

2



Type NENZ
Straight male fitting
with strain relief

Type NENZ

Straight Male Conduit Fitting with Strain Relief - Metric Thread

Materials: 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	M12x1.5	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

Type NEAV

45° Elbow Fitting - Metric Thread / Materials: 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

Type NEBV

90° Curved Elbow Fitting - Metric Thread / Materials: 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

Type NEWV

90° Elbow Fitting - Metric Thread / Materials: 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

Type BENRRE

Corrugated Conduit to Rigid Metal Pipe Connection / Materials: 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

2



Type BESGR
Splice connector

Type BESGR
Splice Connector / Materials: Anti-Static Nylon 12

Part No.	Fits to Conduit Size (mm)		Outside 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

Type BEYR
'Y' Piece / Materials: 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

Type BETR
'T' Piece / Materials: Anti-Static Nylon 12

Part No.	3 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 BEAVR
Conduit adapter

Type BEAVR

Conduit Adapter / Materials: 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

Type BEH

Conduit Clip / Materials: Anti-Static Nylon 12

Part No.	Fits to Conduit Size (mm)		Width x Height x Depth (mm)	Fixing Screw
	NW	Metric		
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



Type GMM
Hex Locknut

Type GMM

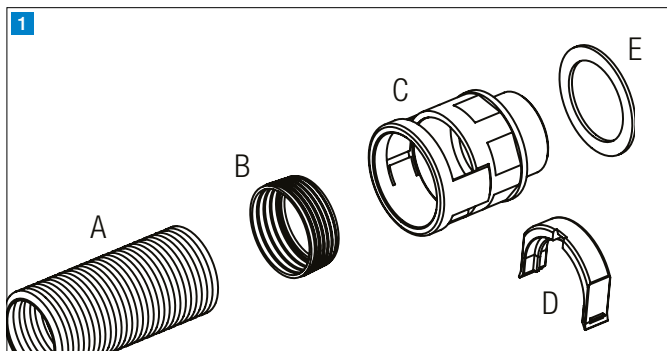
Hex Locknut - Metric Thread / Materials: Nickel plated/Brass

Part No.	Fits to Thread Metric (mm)	Wrench Size (mm)	Height (min.) (mm)
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

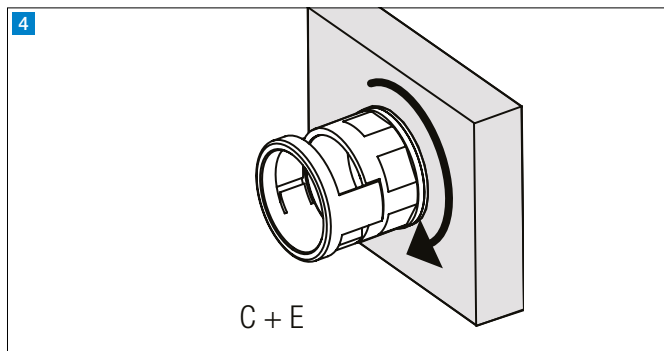
Easy installation with highest assembly reliability

Installation of IP68 safety system (pat.)

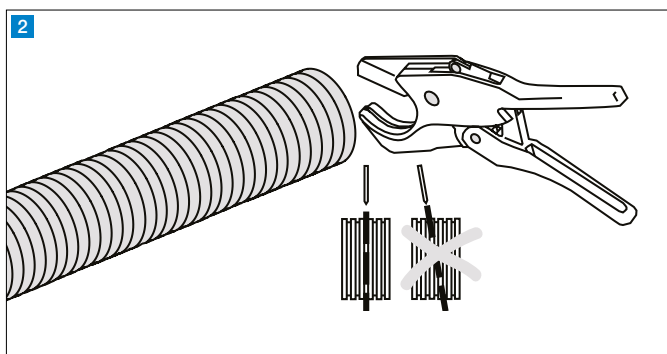
2



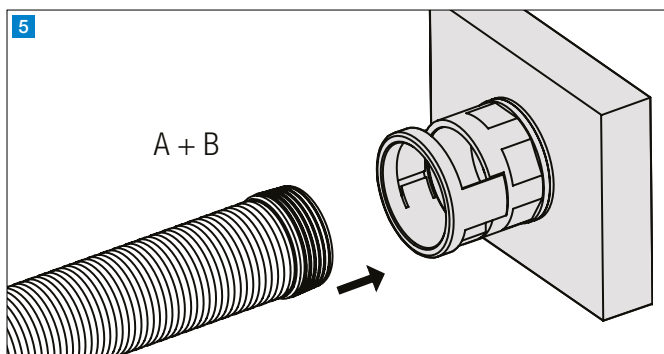
- A. Conduit
- B. Ex Seal cap (yellow)
- C. Fitting
- D. Oval clip
- E. Thread seal (O-ring or flat seal)



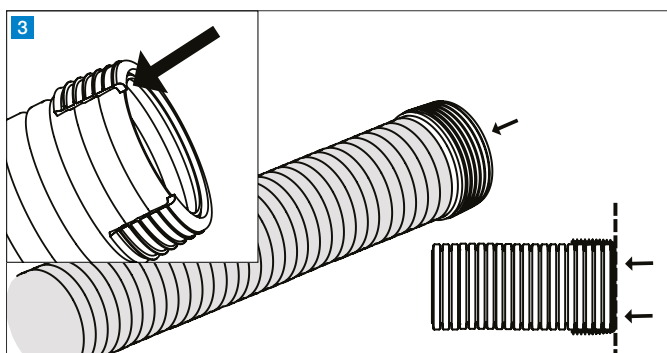
Place seal (E) onto fitting thread (C) and screw in.



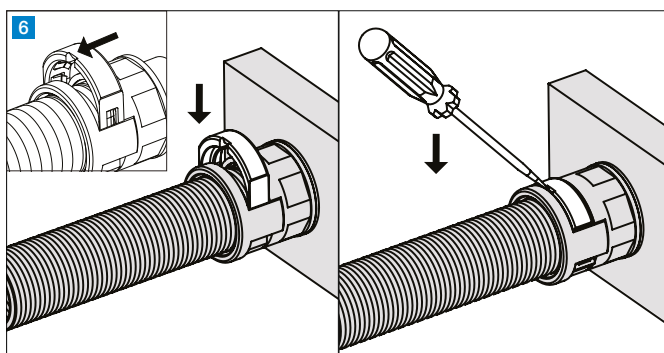
Straight cut of conduit



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



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



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.

Easy installation with highest assembly reliability

Installation of IP68 safety system (pat.)

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.

Resistance

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Resistance Against	Chemical Formula	PA12 Polyamide 12
Acetic acid (10%)	C2H4O2	●●
Acetone	C3H6O	●●●
Ammonia (30%)	NH3	●●●
Benzine	—	●●●
Brake fluid	—	●●●
Caustic soda	HNaO	●●●
Ethyl alcohol (40%)	C2H6O	●●●
Glycol	C2H6O2	●●
Hydrochloric acid (10%)	HCL	●
Methanol	CH4O	●●●
Methyl ethyl ketone	C4H8O	●●●
Nitric acid (10%)	HN03	○
Ozone	O3	●●
Paint thinner	—	●●●
Perchlorethylene	C2Cl4	●●
Paraffin	—	●●●
Phosphoric acid (10%)	H3O4P	●●
Sea water	—	●●●
Soap solution	—	●●●
Sodium chloride	NaCl	●●●
Sulphuric acid (10%)	H2SO4	●●
Toluene	C7H8	●●●
Trichlorethylene	C2HCl3	●●
Turpentine	—	●●●
Urine	—	●●●

Resistance Against Oils and Greases	Chemical Formula	PA12 Polyamide 12
Cutting oils*	—	●●
Diesel oil	—	●●●
ASTM Oil Nr. 3	—	●●●
Fuel oil	—	●●●
Hydraulic oils*	—	●●●
Mineral oils	—	●●●
Spark-erosion liquids	—	●●●
Skydrol	—	●●
Transformer oils*	—	●●●

* Synthetic additives can affect the oil resistance of plastics. Please contact PMA for further information.

- Excellent resistance / suitable for permanent contact
- Resistant / suitable for occasional contact
- Relatively resistant / suitable for short-term contact
- Not recommended

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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Notes

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