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Enclosure certifications

Product certifications are awarded for enclosures as components.

Range		Aim of the certification				
		International standard for electric power enclosures	Degrees of protection	Standards for industrial equipment and UL classification	Marine environment classification or approval for protection and resistance to vibrations	ATEX
		Standard/Directive				
		IEC 62208	IEC 60529	UL508A and CAN CSA C22-2 no. 14	Rules of certifying bodies	European directive no. 94/9/EC EN 60079-0 and -7 EN 61241-0 and -1
SPACIAL	SF	●		●	● ●	
	SM	●		●	● ●	
	SD		●			
	S3D	●		●	● ● ● ●	● (1)
	CRN	●		●	●	
	S44	●				
	S57	●				
	SFX	●		●		
	SMX	●		●		
	SDX		●			
	S3X	●		●	●	
THALASSA	PLA	●		●	●	● (1)
	PLD	●				
	PLM	●		●	●	● (1)
	PLS	●		●		
	TBS/TBP	●		●		
CLIMASYS	CV			●		

(1) ATEX certifications relate to an adapted part of the range. These ranges are distinguished by their EX endings.

Official certification body								
Bureau Veritas	LCIE (Bureau Veritas)	Bureau Veritas Marine Division	TUV Rheinland Group	Underwriters Laboratories	Laboratorio Oficial J.M. Madariaga	Det Norske Veritas	Germanischer Lloyd	Lloyd's Register
								
●	●	●	●	●	●	●	●	●

International enclosure standard

Standards IEC 62208*



Empty enclosures for low-voltage switchgear and controlgear assemblies. General rules.

Application

For empty enclosures before adding the user's switchgear, in the condition as supplied by the manufacturer.

Field of application

Demands for testing the enclosures to be used as part of the switchgear assemblies for voltages of less than 1000 V alternating current and 1500 V direct current.

Information supplied by the manufacturer

- Commercial trademark of the manufacturer: Schneider Electric.
- Mechanical characteristics, materials, conditions for use.
- Conditions for use:
 - Ambient air temperature for outdoor installations: -25 to $+40$ °C.
- Atmospheric conditions for outdoor installations: the humidity can temporarily reach 100% at a temperature of 25 °C.
- Transport and storage conditions: from -25 to $+55$ °C; for limited periods not exceeding 24 h: up to $+70$ °C.

* European standard EN 62208 is identical to IEC 62208. European countries publish this standard according to the body in each country (for example BS EN 62208 in the UK).



Standard tests of standard IEC 62208

- Static loads: test $1.25 \times$ maximum admissible load during 1 hour.
- Lifting: applicable to enclosures with lifting accessories.
- Axial loads of metal inserts: 500 N for 10 seconds for M8 inserts.
- IK code: test according to standard IEC 62262 with pendulum impact tester. After testing, the enclosure keeps its IP rating.
- IP rating: test according to standard IEC 60529. Degree of protection against access to dangerous parts and the penetration of solid bodies and against the penetration of water.
- Thermal stability at a temperature of 70 °C: 7 days.
- Resistance to heat: ball test at 70 °C (1).
- Resistance to abnormal heat and to fire: glow wire test according to IEC 60695-2-10 and IEC 60695-2-11 (1).
- Dielectric strength: 5000 V (1).
- Protection circuit continuity (2): resistance not to exceed 0.1 ohm.
- Weather resistance: duration 500 h (cycle: rain 5 minutes + UV lamp 25 minutes).
- Corrosion resistance:
 - For indoor enclosures:
 - 6 cycles of 24 hours of the damp heat test at 40 °C and relative humidity of 95%.
 - 2 cycles of 24 hours of the salt mist test at 35 °C.
 - For outdoor enclosures:
 - 12 cycles of 24 hours of the damp heat test at 40 °C and relative humidity of 95%.
 - 14 cycles of 24 hours of the salt mist test at 35 °C.












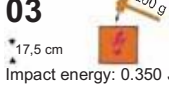















Our empty enclosures are marked CE according to the Low-Voltage Directive (LVD). It is the responsibility of the final equipment manufacturer to respect regulations in force.

(1) Information required for enclosures made from insulating material.
 (2) For metal enclosures.

Degrees of protection provided by enclosures

- The degrees of protection provided by the enclosures are defined by standards IEC 60529 (IP) and IEC 62262 (IK).
- Degrees of protection are indicated by the letters IP followed by two characteristic numerals. The numerals show the degree of protection offered by the enclosure against access to dangerous parts, the penetration of solid bodies (1st numeral), and against the penetration of liquids (2nd numeral).
- The protection against external mechanical impact is indicated by the letters IK followed by a characteristic group numeral.

Note: Many EN European standards are harmonised with international IEC standards. This is the case with enclosure protection standards:
 – EN 60529 = IEC 60529.
 – EN 62262 = IEC 62262.

	IP		IK
First numeral Protection against solid bodies	Second numeral Protection against liquids	Mechanical protection	
0  No protection	0  No protection	0  No protection	
1  Protected against solid bodies larger than 50 mm (e.g.: incidental contact with the hand)	1  Protected against vertically falling water droplets (condensation)	01  7,5 cm Impact energy: 0.150 Joules.	
2  Protected against solid bodies larger than 12 mm (e.g.: finger contact)	2  Protected against water droplets deflected at up to 15° from vertical	02  10 cm Impact energy: 0.200 Joules.	
3  Protected against solid bodies larger than 2.5 mm (tools, wires)	3  Protected against rainwater at up to 60° from vertical	03  17,5 cm Impact energy: 0.350 Joules.	
4  Protected against solid bodies larger than 1 mm (fine tools, small wires)	4  ▲ Protection against water spray from all directions	04  25 cm Impact energy: 0.500 Joules.	
5  ◆ Protected against dust (no harmful deposits)	5  ▲▲ Protected against low-pressure water jets from all directions	05  35 cm Impact energy: 0.700 Joules.	
6  ◆ Totally dust tight	6  Protected against powerful water jets from all directions	06  20 cm Impact energy: 1.00 Joules.	
	7  ** Protected against the effects of immersion	07  40 cm Impact energy: 2.00 Joules.	
	8  *** Protected against prolonged effects of immersion under pressure	08  29,5 cm Impact energy: 5.00 Joules.	
		09  20 cm Impact energy: 10.00 Joules.	
		10  40 cm Impact energy: 20.00 Joules.	

Selection according to the IP protection degrees.

The degrees of protection, explained on the preceding page, is an important element when selecting the enclosures.

The following table shows the protection degrees of the enclosures.

Name	Range	IP 40	IP 41	IP 42	IP 43	IP 44	IP 54	IP 55	IP 65	IP 66
Metal industrial boxes	Spacial S44 and S57									●
Metal derivation boxes	Spacial SDB							●		
Steel universal wall-mounting enclosures	Spacial S3D							● (1)		●
	Spacial CRN									●
Steel modular distribution wall-mounting enclosures	Spacial CRNG							● (1)		●
	Spacial S3DM									●
Terminal wall-mounting enclosures	Spacial S3DB									●
EMC steel wall-mounting enclosures	Spacial S3HF							●		
HMI steel wall-mounting enclosures	Spacial S3CM						●			
ATEX steel wall-mounting enclosures	Spacial S3DEX									●
Stainless-steel wall-mounting enclosures	Spacial S3X									●
ATEX stainless-steel wall-mounting enclosures	Spacial S3XEX									●
Steel floor-standing enclosures	Spacial SM							●		
Steel suitable enclosures	Spacial SF							●		
Stainless-steel floor-standing enclosures	Spacial SMX							●		
Stainless-steel suitable enclosures	Spacial SFX							●		
Steel control desks	Spacial SD							●		
Stainless-steel control desks	Spacial SDX							●		
Thermoplastic industrial boxes	Thalassa TBS-TBP									●
Polyester modular boxes	Thalassa PLS								●	
Polyester wall-mounting enclosures	Thalassa PLM									●
ATEX polyester wall-mounting enclosures	Thalassa PLMEX									●
Polyester floor-standing enclosures	Thalassa PLA (2)					●		●		●
	Thalassa PLD				●			● (3)		

(1) Double door.

(2) Different IP depending on the version. See introduction in Thalassa PLA section.

(3) With gasket.

Selection according to the environment

The location of the enclosures and the physical, chemical and climatic conditions to which they are exposed will determine the model to be used.

- Steel enclosures are particularly well suited to indoor use in industrial environments.
- Stainless-steel enclosures are particularly well suited to corrosive environments or areas where specific hygiene demands are applicable.
- Polyester enclosures are particularly well suited to severe corrosive atmospheres, indoors or outdoors.

Enclosures made from insulating materials guarantee total insulation, reducing electric hazards for persons.

The main characteristics of the plastic materials of our enclosures and their chemical strength are given on page 9/7.

Further help for making the selection is given by the NEMA or UL classification of the enclosure, see page 9/17.

Properties of the plastic materials

Mechanical, electrical, physical and fire-resistance properties

Plastic materials generally used to manufacture our products:

- ABS.
- Polycarbonate.
- PVC (polyvinyl chloride).
- Bayblend® = PC + ABS.
- Polyester reinforced with fibreglass.
- Altuglas.
- Polypropylene.
- Polystyrene.
- Polyamide 6 and 12.
- SBS.

Specifications	Standards	Units	ABS	Polycarbonate	PVC	Bayblend®	Polyester	SBS
Mechanical properties								
Tensile strength	ISO 257	MPa	44	> 65	45	35	85	5
Tensile strain	ISO 527	%	12	> 110	120 to 150	40	0	600
Impact resistance	ISO 179	kJ/m ²	125	No breakage	25	No breakage	60	No breakage
Notching resistance	ISO 179	kJ/m ²	19	25	20	25	50	-
Electrical properties								
Stress point	IEC 60112	-	-	250-300	> 600	> 550	> 600	-
Surface strength	IEC 60093	ohm	1015	> 1015	> 1013	> 1014	≥1012	> 1013
Dielectric strength	IEC 60243	kV/mm	16.5	> 30	30	24	18-20	20
Specific resistivity	IEC 60093	ohm ³ cm	1015	> 1016	≥ 1015	1016	≥ 1012	> 1016
Physical properties								
Softening temperature (Vicat B)	ISO 306	°C	95	145-150	79-80	115	(1)	80
Temperature resistance	-	°C	-40...+90	-50...+125	-20...+65	-35...+90	-50...+150	-40...+120
Water absorption	ISO 62	%	0.2 - 0.45	0.15	< 0.1	0.2	0.2	-
Specific weight	ISO 1183	kg/dm ³	1.04	1.21	1.4	1.12	1.85	0.3 in 24 h
Fire resistance								
Oxygen index	ISO 4589	%	19	26	45-50	22	24.4	18
Glow wire resistance, 2 mm	IEC 60695-2	°C	650	960	960	750	960	750* (1.5 mm)
Glow wire resistance, 3 mm	IEC 60695-2	°C	650	960	960	750	960	NA

(1) No softening of the polyester.

Specifications	Standards	Units	Altuglas	Polypropylene	Polystyrene	Polyamide 6	Polyamide 12
Mechanical properties							
Tensile strength	ISO 257	MPa	30	35	24	40	30
Tensile strain	ISO 527	%	5	400	36	200	300
Impact resistance	ISO 179	kJ/m ²	20	20	63	No breakage	No breakage
Notching resistance	ISO 179	kJ/m ²	3	5	50	31.2	15
Electrical properties							
Stress point	IEC 60112	-	-	-	KB175	KB175	KB180
Surface strength	IEC 60093	ohm	≥ 1014	-	> 1013	1012	5 × 1010
Dielectric strength	IEC 60243	kV/mm	13-15	20	≤ 40	23	55
Specific resistivity	IEC 60093	ohm ³ cm	> 1015	> 1016	> 1015	1011	3 × 1011
Physical properties							
Softening temperature (Vicat B)	ISO 306	°C	120-122	75 (vicat A)	79	230	140
Temperature resistance	-	°C	-20...+80	-10...+80	-15...+60	-20...+100	-50...+125
Water absorption	ISO 62	%	< 0.5	0.1 in 24 h	0.1 in 24 h	1.6	1.5
Specific weight	ISO 1183	kg/dm ³	1.18	0.91	1.06	1.14	1.03
Fire resistance							
Oxygen index	ISO 4589	%	18.5	18	18	24	22
Glow wire resistance, 2 mm	IEC 60695-2	°C	-	650	650	750	650
Glow wire resistance, 3 mm	IEC 60695-2	°C	960	650	650	850	650

Properties of the plastic materials

Resistance to chemical agents

Plastic materials generally used to manufacture our products:

- ABS.
- Polycarbonate.
- PVC (polyvinyl chloride).
- Bayblend® = PC + ABS.
- Polyester.
- Altuglas.
- Polypropylene.
- Polystyrene.
- Polyamide 6 and 12.
- SBS.

The table shows:

- The concentration of the chemical agent in %; sat = saturation.
- The resistance of the material:

+: Resistant.
 O: Limited resistance.
 -: Not resistant.

Resistance to	ABS	Polycarbonate	PVC	Bayblend®	Polyester	Altuglas	Polypropylene	Poly-styrene	Polyamide 6	Polyamide 12	SBS
Acetone	-	-	-	-	-	O	100 +	-	100 +	+	+
Hydrochloric acid	15 +	10 +	30 +	20 +	30 +	sat +	10 +	O	10 -	10 +	10 +
Citric acid		10 +	sat +	10 +	100 +	sat +	sat +	+	10 O	+	10 +
Lactic acid	80 +	10 +	90 +	10 -	100 +	20 +	90 +	O	50 O 90 -	+	sat +
Nitric acid	30 +	10 + 100 -	50 +	10 +	20 + +	10 + 100 -	25/ 50	O	2 O 10 -	-	50 +
Phosphoric acid	85 +	100 +	sat +	+	100 +	10 + 95 -	sat +	O	2 O 10 -	50 +	+
Sulphuric acid	50 +	50 + 100 -	96 +	30 +	70 +	30 +	96 +	O	3 -	10 +	96 +
Alcohol	O	96 +	96 +	-	50 O	50 O	96 +	+	96 O	96 +	+
Pure aniline	O	-	100 -	-	O	-	100 +		100 O	100 O	
Mineral base (hydroxide)		O	10 +	-	100 +	10 +	50 +	O	10 + 50 O	50 O	
Benzene	+	100 -	-	+	-	O	100 O		100 +	+	-
Liquid bromine		100 -	-	-			100 -			100 -	-
Liquid chlorine		-	100 -	-	sat +	-	100 -		100 O	-	50 +
Sea water	+	100 +	100 +	+	100 +	100 +	-	100 +		100 +	sat +
Petrol	+	100 +	100 O	-	100 +	100 O	-	-	100 +	+	-
Ether	-	100 O	100 -	-	100 O	+			100 +	100 +	-
Hexane	O	+	O	O	-		100 +		100 +	100 +	-
Oil and greases	+	100 +	100 +	O	100 +	100 O	100 +	-	+	100 +	-
Aromatic hydrocarbon	O	-	-	-	-	+	-	-	-	+	-
Fuel oil	O	100 O	100 +	-	100 +	100 -	100 +		100 +	100 +	-
Naphthalene			100 O	-	100 +	100 -	100 +		100 +	100 +	
Nitrobenzene	-	-	100 -	-	-	-	100 O		-	O	-
Phenol	-	-	sat O	-	20 O	-	sat +		-	-	10 O
Mineral salts		+	+	+	+	+	+			+	+
Iodine solution		O	-	+		-			+		
Toluene	-	-	100 -	-	+	O	100 O	-	100 +	100 +	-
Trichloroethylene	-	-	100 -	-	-	-	100 O	-	100 -	100 O	-
Urea		sat +	sat +	+			sat +		10 +	sat +	sat O

For other chemical agents, please contact us.

All this information is taken from the best sources and provided for information purposes only, with no commitment on our behalf.

Polyester base coating properties



Product type

Thermosetting polyester resins based powder coating modified by epoxy resins and designed for decoration and to prevent corrosion.

The performance of this coating is superior to conventional epoxy powders in terms of: colour stability, temperature resistance and weather resistance.

Grey RAL 7035; appearance: structured.

Mechanical properties

Test conditions: steel samples with a thickness of 1 mm.

Degreasing using biodegradable surface-active agents.

Film thickness: 60 microns.

Bonding (scratching and adhesive tape)	ISO 2409	Class 1
Eriksen stamping	ISO 1520	≥ 7 mm
Direct impact resistance	ISO 6272	> 1 kg/70 cm
Indirect impact resistance	ISO 6272	> 1 kg/20 cm
Bending around conical mandrel	ISO 6860 - ASTM D 522-88	Maximum cracking of 70 mm, without the paint coming loose

Chemical properties

Tests conducted at ambient temperature on phosphated samples covered with a 150 to 200 micron film:

■ Film intact.

■ Film attacked (blistering, yellowing, loss of gloss).

Number of months		2	4	6	8	10	12
Acid	Acetic	20%	■				
	Sulphuric	30%	■				
	Nitric	30%	■				
	Phosphoric	30%	■				
	Hydrochloric	30%	■				
	Lactic	10%	■				
	Citric	10%	■				
Base	Soda	10%	■				
	Ammonia	10%	■				
Water	Distilled water		■				
	Sea water		■				
	Tap water		■				
	Diluted chloride bleach		■				
Solvents	Petrol		■				
	Higher alcohols		■				
	Aliphatics		■				
	Aromatics		■				
	Ketones-esters		■				
	Tri-perchloroethylene		■				

Physical properties

Temperature resistance: -40 °C and 100 hours at +150 °C (colour: white).

Gloss retention: good.

Resistance to corrosion

Compliance with standard IEC 62208 for outdoor installations: 288 h of humid heat and 336 h of salt mist.

Polyester base coating properties

Nuclear decontamination

Applicable to colours RAL 7035 and AFNOR A550.
Standard NFT 30901. Percentage of decontamination for contamination by fission products or plutonium. Please consult us for further details.

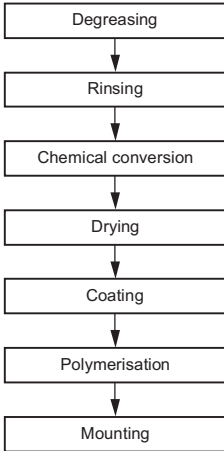
Accelerated aging

Standard IEC 62208: 500h UV according to ISO 4892 (method A) (adherence of the coating with minimum retention of 50% on the grid according to ISO 2409).

Fire behaviour

Class M1 (self-extinguishing material).
Class M0 (for coating on a metal base).

Manufacturing process

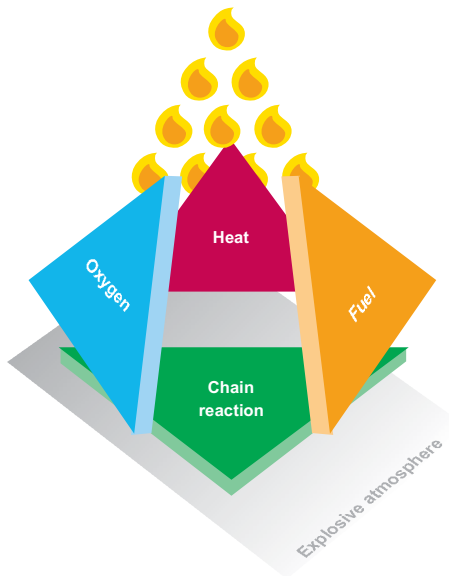




Product directive 94/9/CE: defines the manufacturers' obligations.



Personal protection directive 99/92/CE: defines the users' obligations.



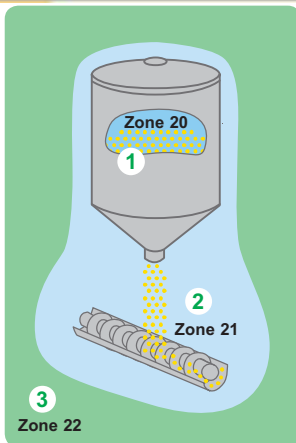
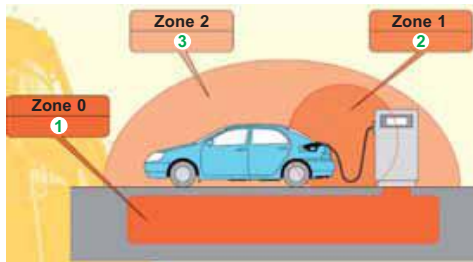
Potentially explosive atmospheres: important information

What is ATEX?

- It is a term commonly used to describe potentially EXplosive ATmospheres and standards for protection systems and equipment.
- Two European directives, ATEX 99/92/CE and ATEX 94/9/CE, and international standards IEC 60079 and IEC 61241, harmonized with EN European standards, apply to this field.

How is a potentially explosive atmosphere defined according to ATEX?

- An potentially explosive atmosphere is defined as a mix of flammable substances in the form of gas, vapour, dust (cloud or deposit) which, in air and under normal atmospheric conditions, can completely or partially catch fire in the form of an explosion when exposed to a source of ignition.



Classification of an explosive atmosphere

- They are classified into groups and zones according to directive 99/92/CE and IEC standards as follows:

Destination	Categories/presence of potentially explosive atmosphere	Hazardous zones	Atmosphere
Group I Mines	M1 and M2	Gas and dust (G & D)	
		Zone 0: gas and vapour	G
Group II surface Industries	1 Permanent or frequent	Zone 20: mist and dust	D
	2 Occasional	Zone 1: gas and vapour	G
		Zone 21: mist and dust	D
	3 Rare	Zone 2: gas and vapour	G
		Zone 22: mist and dust	D

Equipment for potentially explosive atmospheres

- Since 1st July 2003, European directive ATEX 94/9/CE has made it compulsory to use certified electric or non-electric equipment when it must be installed in zones with explosive atmospheres (gas or dust).
- Certification must be provided by a body which is notified according to the same directive.
- The body notifies its assessment of the quality of the production and certifies that the product complies with the health and safety demands defined in the directive and the international standards.
- The certificate shows the category of the product by marking, and thus the zone and atmosphere in which it can be used.
- The standards define the following types of protection for electric equipment:

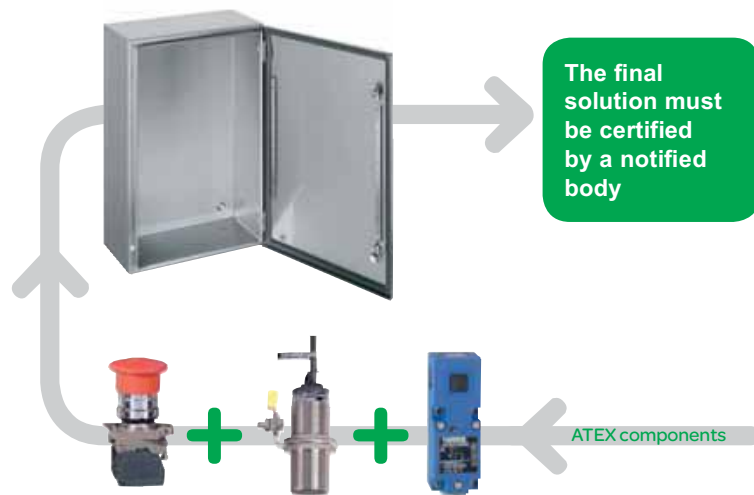
Electrical equipment				
CENELEC	IEC	Gas: symbol of the types of protection	CENELEC/IEC	Powder: symbol of the types of protection
EN 60079-0	IEC 60079-0	General rules	IEC/EN 61241-0	General rules
EN 50015	IEC 60079-6	0-oil immersion	IEC/EN 61241-1	tD-protection by enclosures
EN 50016	IEC 60079-2	p-pressurised enclosures	IEC/EN 61241-4	pD-protection by pressurisation
EN 50017	IEC 60079-5	q-powder filling	IEC/EN 61241-11	iD-protection by intrinsic safety
EN 60079-1	IEC 60079-1	d-flameproof enclosures	IEC/EN 61241-18	mD-protection by encapsulation
EN 60079-7	IEC 60079-7	e-increased safety		
EN 50020	IEC 60079-11	i-intrinsic safety		
EN 60079-15	IEC 60079-15	n-type of protection "n"		



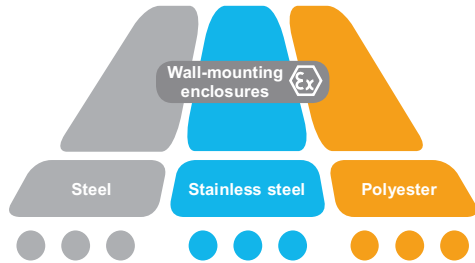
Degree of protection

In hazardous areas, equipment is required to offer a minimum degree of protection of IP 54, but it can be tested or certified with a higher degree of protection.

- Enclosures are certified as components. They will be assembled with other ATEX electrical, pneumatic and hydraulic components, among others to form a final solution which, in turn, must be ATEX-certified and subject to a declaration of conformity.



Fields of application of Schneider Electric ATEX enclosures



Zone of application of Schneider ATEX wall-mounting enclosures

Three types of enclosures

- All the wall-mounting enclosures presented in this brochure comply with standards for protection against the increased risk of explosion in atmospheres charged with gas (G) and/or dust (D).
- The Schneider offer, designed to be used in group II, is classified as category 2.

Destination	Categories/presence of potentially explosive atmosphere	Hazardous zones	Atmosphere
Group I Mines	M1 and M2	Gas and dust (G & D)	
Group II Surface industries	1 Permanent or frequent	Zone 0: gas and vapour	G
	2 Occasional	Zone 20: mist and dust	D
		Zone 1: gas and vapour	G
		Zone 21: mist and dust	D
3 Rare	Zone 2: gas and vapour	G	
	Zone 22: mist and dust	D	

- Category 2 products can be used as category 3.
- Our products are qualified for increased safety "e" (Ex e) but not for explosion-proof safety "d" (Ex d).
- The wall-mounting enclosures have the following marks: Ex II 2 GD Ex e II Ex tD A21 IP 66 according to directive 94/9/CE and standards EN 60079-0 (2004), EN 60079-7 (2006), EN 61241-0 (2005) and EN 61241-1 (2004).
- The wall-mounting enclosures offer a degree of protection IP 66 according to EN 60529, exceeding the recommendations of the ATEX directive.
- Certification of our production sites and inspection procedures guarantees observance and consistency of the quality level.

Description of the marking label affixed to ATEX certified wall-mounting enclosures



Download our ATEX certificates from our site.

