

High-speed door systems

for potentially explosive atmospheres

EX Series



EFAFLEX 
safe high-speed doors

Explosion protection in general

The ATEX Product Directive 2014/34/EU sets out the intended use of equipment and protective systems in potentially explosive atmospheres.

The ATEX Workplace Directive 1999/92/EC sets out the minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres. According to this directive, the operator of systems in potentially explosive atmospheres must draw up an explosion protection document within the scope of their risk assessment. Additionally, they are required to classify potentially explosive atmospheres into explosion protection zones, among other things.

Our EX series door systems can be used in the following explosion protection zones:

Gases/ Zone 1 (II 2G Ex IIB T4 Gb) **Dusts*** Zone 21 (II 2D IIIB 135°C X Db)
Vapours Zone 2 (II 3G Ex IIB T4 Gc) Zone 22 (II 3D IIIB 135°C X Dc)

Certification: TÜV 20 ATEX 191287 X

X = special conditions of use

* optional on request

The control box must be installed outside the potentially explosive atmosphere.

EX series high-speed door systems are particularly designed for use in potentially explosive atmospheres in accordance with the ATEX Directive 2014/34/EU. All electrical equipment is included in a list of equipment, stating the explosion protection properties and the IEC certificate number, which is handed over to the customer together with the door documentation. Mechanical explosion protection is implemented according to the requirements of the explosion protection zone.

EX command encoder:

- Push button
- Induction loop
- Key switch
- Pull switch
- Reflective light barriers









Potentially explosive atmospheres

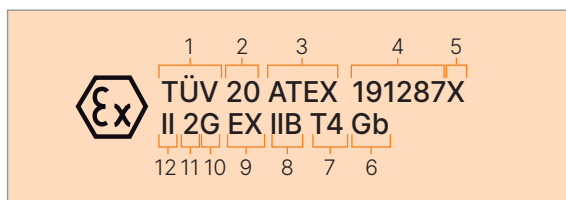
Conditions and classification of zones			Required marking of the devices			
Flammable substances	Temporary behaviour of the explosive atmosphere	Classification of potentially explosive atmospheres	Group as defined in Directive 2014/34/EU	Equipment category as defined in Directive 2014/34/EU	Equipment group as defined in EN IEC 60079-0	Equipment protection level (EPL) as defined in EN IEC 60079-0
Gases and vapours	occur occasionally during normal operation	Zone 1	II	2G or 1G	II	Gb or Ga
	do usually not occur, or occur only for short periods during normal operation	Zone 2	II	3G or 2G or 1G	II	Gc or Gb or Ga
Dusts	occur occasionally in the form of a cloud during normal operation	Zone 21	II	2D or 1D	III	Db or Da
	do usually not occur in the form of a cloud during normal operation or occur only for short periods	Zone 22	II	3D or 2D or 1D	III	Dc or Db or Da

EX marking according to 2014/34/EU (ATEX)

Classification of potentially explosive atmospheres	Flammable substances	Conformity statement number according to 2014/34/EU	Group as defined in Directive 2014/34/EU
Zone 1	Gases/vapours	 TÜV 20 ATEX 191287 X	II
Zone 2	Gases/vapours	 TÜV 20 ATEX 191287 X	II
Zone 21*	Dusts		II
Zone 22*	Dusts		II

* optional on request; X = special conditions of use for the door system

Conformity statement number according to 2014/34/EU of TÜV NORD CERT GmbH



(Sample figure on the type plate of the door system for zone 1)

- 1 Notified body
- 2 Test year
- 3 Test standard ISO 80079-36:2016
- 4 IECEx test report number
- 5 Special conditions of use for the door system
- 6 Equipment protection level (EPL) as defined in EN 60079-0
- 7 Temperature class T4 (> 135 °C ... ≤ 200 °C)
- 8 Explosion group
- 9 Marking for electrical equipment: corresponds to one or more types of protection
- 10 Type of potentially explosive atmosphere: mixture of air and gases, vapours and fog
- 11 Equipment category as defined in 2014/34/EU
- 12 Equipment group

Division of gases and vapours

Gases and vapours		Assignment of the gases and vapours according to ignition temperature	Temperature class	Maximum permissible surface temperature (equipment)	Permissible temperature classes (equipment)
Ammonia, methane, ethane, propane	Urban gas, acrylonitrile	> 450 °C	T1	450 °C	T1 to T6
n-butane	Ethylene, ethylene oxide, ethyl alcohol	> 300 °C ... ≤ 450 °C	T2	300 °C	T2 to T6
Petrol in general, jet fuel, n-hexane, cyclohexane	Hydrogen sulphide	> 200 °C ... ≤ 300 °C	T3	200 °C	T3 to T6
Acetaldehyde	Ethyl ether	> 135 °C ... ≤ 200 °C	T4	135 °C	T4 to T6

Groups

IIA	IIB
Permissible equipment groups	
IIA, IIB, IIC	IIB, IIC

Equipment category as defined in Directive 2014/34/EU	Marking for electrical equipment	Permissible equipment groups	Permissible temperature classes (equipment)	Equipment protection level (EPL) as defined in EN IEC 60079-0	
2G	EX	IIB	T4	Gb	
3G	EX	IIB	T4	Gc	
2D	–	IIIB	T135 °C	X	Db
3D	–	IIIB	T135 °C	X	Dc

Division of dusts

Permissible equipment groups	Groups	Dusts
IIIA, IIIB, IIIC	IIIA	combustible lint
IIIB, IIIC	IIIB	non-conductive

Max. permissible surface temperature of the equipment

Temperature limit for dust layers $T_{s\text{ mm}}$: Minimum ignition temperature of the dust layer	$T_{\text{max.}} \leq T_{s\text{ mm}} - 75\text{ °C}$
Temperature limit for dust layers T_{cl} : Minimum ignition temperature of the dust cloud	$T_{\text{max.}} \leq 2/3 T_{\text{cl}}$
Maximum permissible surface temperature of the equipment:	the lowest of the two $T_{\text{max.}}$ values



EFA-SST® EX AT A GLANCE:

- Can be used in explosion protection zones 1 and 2 and optionally on request in explosion protection zones 21 and 22
- Wind load class 2 to 4
- Suitable for external and internal applications
- Application temperature:
- 15°C to + 50°C
- Opens in up to 1.0 m/s
- Closes in up to 0.5 m/s
- Up to 200,000 load cycles per year
- Standard sizes up to
W=4,000 mm, H=5,000 mm

The hall door for explosion protection. EFA-SST® EX

The EFA-SST® EX is excellently suited for both indoor and outdoor use. With its fixed door leaf, it enables a high opening and closing speed and is distinguished by high wind resistance and optimal sealing. EFAFLEX offers high-speed spiral doors from the EX series in two versions: the standard variant with round spiral and the oval spiral variant, which we recommend for confined spaces.

MODERN LATHS FOR DIFFERENT APPLICATION AREAS

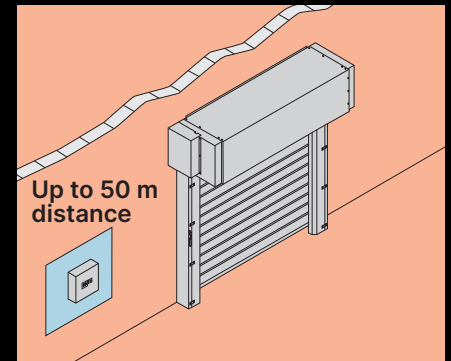
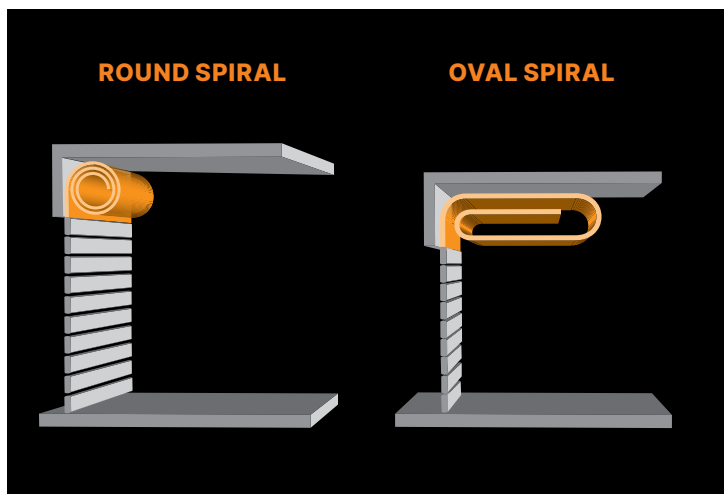
The smooth door leaf consists of double-walled, anodised aluminium laths with large material thickness in the best quality for the 151-mm division version; for the 225-mm division version it consists of single-walled aluminium laths. Depending on the desired incidence of light, we can integrate any number of EFA-CLEAR® sight laths made of acrylic glass (optionally "break-proof" polycarbonate). As a further variant of the door leaf design, ventilation laths can be used to ensure defined air exchange. The individual colour design of the door leaf can be realised in almost any RAL colour according to individual requirements.

SPACE-SAVING DESIGN

The advantage of EFAFLEX high-speed spiral doors: The door leaf is not wound on a shaft but kept at a distance in the EFAFLEX spiral to save space. The laths are screwed to large hinge straps on both sides. The laths are guided by particularly smooth-running and quiet rollers. Therefore, no drive or transmission forces act within the door leaf. This door construction permits almost wear-free operation while meeting the highest requirements.

APPLICATION

- Industrial applications
e.g. chemicals, hazardous substances, painting systems and pharmaceuticals
- Suitable for external and internal applications
- Outdoor installation possible under an on-site canopy



Orange square: Potentially explosive atmosphere

Blue square: No potentially explosive atmosphere

The control box must be installed at an ambient temperature of + 5 °C to + 50 °C and outside the potentially explosive atmosphere.

FOR USE IN EXPLOSION PROTECTION ZONES

The EFA-SST® EX high-speed spiral door has been developed in accordance with the ATEX Directive 2014/34/EU specifically for use in potentially explosive atmospheres:

Gases/vapours:

Zone 1 (II 2G Ex IIB T4 Gb)

Zone 2 (II 3G Ex IIB T4 Gc)

Certification:

TÜV 20 ATEX 191287 X

Dusts*:

Zone 21 (II 2D IIIB 135°C X Db)

Zone 22 (II 3D IIIB 135°C X Dc)

X = special conditions of use

* optional on request

EFA-SRT® EX AT A GLANCE:

- Can be used in explosion protection zones 1 and 2 and optionally on request in explosion protection zones 21 and 22
- Heavy-duty internal door
- Operating temperature: + 5 °C to + 50 °C
- Opens in up to 1.0 m/s
- Closes in up to 0.5 m/s
- Up to 150,000 load cycles per year
- Standard sizes up to W=4,000 mm, H=4,000 mm

FOR USE IN EXPLOSION PROTECTION ZONES

The EFA-SRT® EX high-speed roll-up door has been developed in accordance with the ATEX Directive 2014/34/EU specifically for use in potentially explosive atmospheres:

Gases/vapours:

Zone 1 (II 2G Ex IIB T4 Gb)

Zone 2 (II 3G Ex IIB T4 Gc)

Certification:

TÜV 20 ATEX 191287 X

Dusts*:

Zone 21 (II 2D IIIB 135°C X Db)

Zone 22 (II 3D IIIB 135°C X Dc)

X = special conditions of use

* optional on request

The internal door for explosion protection. EFA-SRT® EX

In addition to a standard frequency converter and a microprocessor control, the EFA-SRT® EX contains all proven features of the latest door technology. Permanent door leaf tensioning and a standard weight counterbalance are realised by a tension spring mechanism. The motor brake can be released manually by the standard release lever. So the tension spring mechanism alone enables partial opening of the door system. The whole system also works without power supply and is fast and easy to use as it does not require, for example, an emergency hand crank.

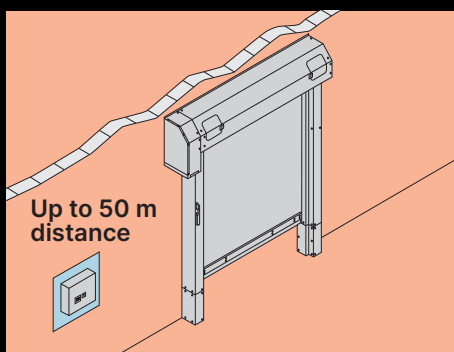
OPTIMISED DOOR CASE SYSTEM


A robust guide on the sides of the door leaf prevents undesirable air exchange in the event of wind, draughts and drops in air pressure. The high-speed roll-up door's black, antistatic special curtain satisfies the high explosion protection requirements and is also transversely stable, which prevents the door leaf from bulging inwards or outwards. The door cases made of sendzimir galvanised steel are also available powder-coated in an RAL colour or in stainless steel on request.


APPLICATION

Industrial applications

- e.g. chemicals, hazardous substances, painting systems and pharmaceuticals
- Suitable for internal applications



 Potentially explosive atmosphere

 No potentially explosive atmosphere

The control box must be installed at an ambient temperature of + 5 °C to + 50 °C and outside the potentially explosive atmosphere.



For more information on the topic of
explosion protection visit:
www.efaflex.com/explosion-protection

Optional accessories for your individual requirements.



Emergency operation lever

OPTIONAL SAFETY EQUIPMENT

- Additional emergency operation lever
- Locking lever (for EFA-SST® EX)
- Approach area protection: induction loop
- Additional reflective light barrier
- Emergency stop control
- Limit switch
- Complete covering as finger protection



EFA-CLEAR® sight laths

OPTIONAL DOOR EQUIPMENT

- Control box heating
- Lockable control box
- Frame extension
- Powder coating:
 - Door cases
 - Door leaf (for EFA-SST® EX)
- Stainless steel version (door cases)
- EFA-CLEAR® sight laths (for EFA-SST® EX)
- EFA-VENT ventilation laths



EX key switch open-close EX emergency stop control
(photo: R steel)

OPTIONAL COMMAND ENCODER

- Push button (different versions)
- Pull switch
- Induction loop
- Key switch
- Key push button
- Reflective light barrier



EX push button open-close
(photo: R steel)

Technical details

High-speed doors explosion protection

		EX Series	
		EFA-SST®	EFA-SRT®
		EX	EX
Application	Interior door Lock-up doors	● ●	● –
ATEX Directive	According to RL 2014/34/EU	Zone 1 & 2	Zone 1 & 2
Wind load max.*	According to DIN EN 12424 class resp. in km/h	2 – 4 –	– 43
Operating forces/ safe closing	According to DIN EN 13241 class	fulfilled	fulfilled
Resistance against water ingress*	According to DIN EN 13241 class	0	–
Air permeability*	According to DIN EN 13241 class	2	–
Direct airborne sound insulation R _w *	in dB according to DIN EN 717-1	23	12
U value maximum*	in W/m ² K according to DIN EN 13241	5.8	–
Door size (in mm)	Width W max.	4,000	4,000
	Height H max.	5,000	4,000
Average speed, approx.*	Opening in m/s	1.0	1.0
	Closing in m/s	0.5	0.5
Door blade guidance	Round Spiral	●	–
	Oval Spiral	●	–
Steel design	Galvanized sheet steel frame	●	●
	Stainless steel	○	○
	Powder coated in RAL colours	○	○
Door blade	EFA-CLEAR® Vision laths single-walled	●	–
	EFA-VENT® Ventilation laths	○	–
	EFA-ALUX® Aluminium laths	●	–
	Colour according to RAL (without vision panel)	○	–
	flexible fabric in different colours with/ without vision panel	–	black without vision panel
Fire class	Building Material class DIN 4102	B2	B2
Weight balancing by		Spring	Spring
Designed for approx ... operating cycles per year		200,000	150,000
Drive	Electric motor	●	●
Control	EFA-TRONIC® Professional	●	●
	Main switch and foil keypad	●	●
Lead	Electricity connection 230 V/50 Hz	●	●
	Circuit breaker	16 A (K)	16 A (K)
Manual locking		○	–
Emergency operation	Automatic after manual activation	●	●
Safety Devices	Contact edge	●	●
	Light barrier	●	●

● Standard, ○ upon request, – Not available, * Depending on door blade, door blade guidance and door size, we reserve the right to make technical alterations!

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EFAFLEX® is a registered and legally
protected trademark.

Subject to technical changes. Some
diagrams depict special features.

Overall design:

www.creativconcept.de 02 | 2024

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safe high-speed doors