



Safety is for life.™



# REMBE® EXPLOSION SAFETY

Consulting. Engineering. Products. Service.

# REMBE® EXPLOSION SAFETY – MORE AFFORDABLE THAN YOU THINK



More than 600 severe dust explosions have been recorded in the EU alone since 1970. In the US, there have been well over 900 since 1980. Yet these documented cases are just the tip of the iceberg.

Many explosions, mostly small but still with devastating consequences, do not appear in any statistics. The reports published by the Institute for

Occupational Safety and Health of the German Social Accident Insurance (IFA) prove that explosions and the damage they cause pose a threat in all industries and frequently result in major commercial losses.

Primary explosion safety measures focus principally on preventing explosive atmospheres from occurring in the first place. However, these techniques usually have limited effectiveness due to the process conditions or they are unable to eliminate the risk of an explosion completely.

**A comprehensive safety concept based on explosion safety is absolutely crucial for reducing the dangerous consequences of an explosion to an acceptable level.**

**At REMBE®, we do not just supply the most effective products for your needs. We design complete explosion safety solutions that take into account the operating efficiency of your plants and legal safety requirements. An efficient and reliable solution, tailor-made for your operating requirements. Every time. Guaranteed.**

Our explosion safety solutions are among the leading systems available in the market. This is partly due to our high quality standards – as you would expect from products **Made in Germany**. We are also aware that when an explosion occurs, you need assistance as quickly as possible. This is why we offer the REMBE® Rush Order Service, which supplies spare parts and products in next to no time. We help you to **resume production quickly and effectively with minimum downtime.**

Contact us! You will be surprised how easily and cost-effectively we can optimize your production processes using REMBE® explosion safety solutions.

**We look forward to receiving your call!**

A handwritten signature in blue ink, appearing to read 'Stefan Penno'.

Stefan Penno  
Managing Director



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# SAFETY IS FOR L

Our mission: your safety.

Operational safety is an important responsibility. In fact, it's a mission to which we have dedicated ourselves wholeheartedly for over 45 years now. Throughout the world, our experts have a single aim – to provide the best possible protection for your systems and processes.

## Consulting

**We don't just work at our desks.  
We also work at your premises.**

Each production facility is different and has different requirements. This is why our experts look closely at your entire plant with you to determine what's genuinely reasonable and what will be the best solution for you. It's your best investment in safety.

**Solutions off-the-shelf? Not from REMBE®.**

Once we have looked at all the relevant documents, we will identify all the existing gaps in your explosion risk management plan and create a cost-effective safety policy for you that is precisely suited for your company.

**You'll benefit from our decades of experience which ensure that you always receive** an honest analysis and products of the highest quality. Working diligently and responsibly, our attention is fully focused on the customized optimization of your routines, manufacturing processes and products.

## Engineering

**We don't just make recommendations.  
We give you the best solution.**

From the drawing board to production – you will have a safety system that is specifically tailored to your processes and operational requirements.

**Whether it's explosion safety or process safety,** our engineering ensures that you receive the best solution every time.

## Quality – the key to your safety

Our products are manufactured according to the latest, up-to-date international standards for management systems, pressure equipment and explosion safety devices. In addition to prioritizing quality and reliability, we attach major importance to eco-friendly technologies, manufacturing processes and compliance with standards. High-quality materials from controlled sources ensure that our products have exceptionally long lifetimes.



Technical drawing of REMBE® Q-Rohr®.

# IFE.

## **Choosing REMBE® means opting for the highest standard of safety.**

You will always have the support of our experts in matters of explosion safety and pressure relief technology – 24/7, all year round. That is our promise!

## **Products**

### **Our products are not just excellent. They are certified.**

Good is never good enough for us. And so we continuously put ourselves to the test. The result is safety products licensed under globally recognized and industry-specific standards and regulations.

Moreover, we are the first company worldwide to offer SIL-equivalent parameters for mechanical (flameless) explosion venting products and their appropriate signaling units.

**This high quality standard makes perfect economic sense for you.** Our extensive product range ensures that you always receive the most cost-effective and reliable solution for your needs.

**We take responsibility for the big picture.** With REMBE® you get everything from a single source, thus ensuring a cost-effective, safe solution.



## **Service**

### **Downtime costs money. Our service never stands still – throughout the world.**

From start-up to regular maintenance – we ensure that your production runs smoothly and without disruptions. All the products we produce can be identified by their batch and serial numbers for many decades, allowing exact reproduction.

**If you're ever in a hurry,** why not use our Rush Order Service? We guarantee that you are given the highest priority and that your product is produced and shipped immediately. Contact us for more details.

### **“REMBE® speaks your language”**

Our global network of offices and our many international experts guarantee that we understand you and your needs. Just give us a call.

## **Certification**

### **Management systems**

EN ISO 9001:2015, ISO/TS 29001:2010, KTA 1401, EN ISO 14001:2015

### **Products**

ATEX Directive 2014/34/EU, TR CU 012 / 2011, TR CU 010 / 2011, TR CU 032 / 2013, FM Global, GL, EHEDG, PED 2014/68/EU, ASME Sec. VIII, Div. 1, China Manufacture License, KOSHA (South Korea)

### **Testing standards**

AD 2000-Merkblatt A1, EN ISO 4126-2, EN 1127-1 /-13463/ -14373/-14491/-14797/-14994/-15233/-16009/ -16447, VDI 3673, NFPA 68, NFPA 69, IEC 61508

### **Approval of German Aviation Authorities**

Known Consignor (KC/00912)

### **Approval of German Customs Authorities**

AEOF - Customs Simplifications/Security and Safety (DE AEOF 126130)

# THE PRINCIPLES OF EXPLOSION SAFETY

## Why do explosions occur?

When combustible material, an ignition source and oxygen collide in a confined space, the result is an explosion. Preventative explosion safety measures aim to stop this potentially lethal mixture from occurring. However, in practice, the vast number of potential ignition sources alone almost always makes this impossible. Consequently, the most important steps industrial companies can take for explosion safety purposes are protection measures that minimize the damage caused by an explosion.

Industrial plants must always be protected against the consequences of explosions to ensure that employees are safe and production can be resumed quickly. After all, every hour of lost production costs money. In most cases, explosion safety can be provided cost-effectively through explosion venting and explosion suppression.

We would be happy to show you solutions tailored to your processes that will reduce the damage caused by an explosion to a negligible level – enabling you to resume production quickly after an explosion.

The five requirements for a dust explosion.



## The 3 key features of a modern protection concept

1. **Reliability and productivity:** Protective systems must be permanently available and operational. The possibility of false triggers must be excluded since this reduces the productivity of the plant.
2. **Compliance:** Modern protective systems must satisfy all legal requirements and thus guarantee legal compliance for plant operators.
3. **Cost-effectiveness:** Protective systems must be as simple as possible to install and require minimum investment of time and financial resources. The total costs of ownership of the systems must also be kept as low as possible.

All protection concepts from REMBE® meet these requirements. That's a promise!

## Why is explosion safety so crucial?

Higher – faster – further: not just the objective in sport but also in the development of industrial plant technology. Twenty-first century machinery has long been optimized and is running at high speeds. However, as plants approach their maximum capacity, the risk of an explosion also increases. Rising levels of fine particles produced by fast-running machines are one of the main reasons that the probability of explosions increases.

These explosions almost always cost human lives, but even if nobody is harmed, an explosion in an inadequately protected industrial plant can still cause immense structural and financial damage. History shows that explosions in unprotected plants have devastated companies time and time again. After all, every day of lost production puts **the company's existence at risk**. Explosion safety concepts usually enable businesses to **eliminate production downtime entirely or, at the very least, reduce it dramatically – and with REMBE® products it is always more affordable than you think.**

## 3 steps to make your processes safer

1. **Risk assessment / dust hazard analysis**

If there is a danger of an explosion occurring, you must take steps to prevent, or at least reduce, the probability of this happening (see step 2). Alternatively, you must implement protective systems that reduce the damage an explosion would cause to an acceptable level (see step 3).
2. **Prevention and organizational measures**
  - **Technical measures:** Effective dust extraction systems reduce the build-up of explosive atmospheres. Inert gas blanketing is also recommended to reduce oxygen levels.
  - **Eliminate effective ignition sources:** Always use appropriate equipment and prevent foreign objects from entering the product stream. Check that equipment is correctly grounded to avoid electrostatic discharges.
  - **Organizational measures:** Employees should always receive comprehensive training. Documented cleaning procedures and permit-to-work systems for hot-work create an additional level of safety.
3. **Protective measures**
  - **Explosion pressure resistant or explosion-proof vessels:** These terms are used to describe vessels that are strong enough to withstand the maximum explosion pressure.
  - **Conventional explosion venting:** Explosion venting is a technique for protecting enclosures that prevents the

pressure within the vessel from rising above a permitted level. Breaking points, such as explosion vents, installed on an enclosure, rupture when the pressure reaches a predefined level and thus reduce the pressure in the vessel below its strength.

- **Flameless explosion venting:** This essentially uses the same principle as conventional explosion venting. However, it offers the advantage that the explosion can be vented indoors because the flame and pressure wave of the explosion are contained. This eliminates the risk of injury even when working in close proximity to the equipment.
- **Explosion suppression:** Pressure and/or infrared sensors detect the explosion at a very early stage. Within a few milliseconds, a control system smothers the beginning of the explosion using an extinguishing powder that is released into an enclosure.

Assessment, prevention and protection – REMBE® is your expert partner.

Protective measures against explosions also include isolation systems in order to prevent the devastating effects of explosion propagation or secondary explosions in the connected vessels.



**Q-Rohr®**

Flameless explosion venting of dust and gas explosions (p. 26)



**Q-Box**

Cost-effective indoor flameless explosion venting of dust explosions (p. 28)



**Q-Bic™**

Explosion suppression, also for toxic and pharmaceutical substances (p. 31)

**Flameless explosion venting / explosion suppression**

Well away from an external wall

Passenger traffic nearby

**Located indoors**

**or**

Close to an external wall  
(3.3 – 19.7 ft; 1 – 6 m)

No passenger traffic nearby  
(safety distance of min. 65.6 ft; 20 m)

**Conventional explosion venting with explosion vents**

**Explosion vent**

REMBE® offers you the optimum explosion vent for every application and all operating conditions (from p. 12)



**Explosion vent + vent duct**

The explosion vent is connected to a duct, which transmits the explosion to a vent duct cover (from p. 12)



**START**

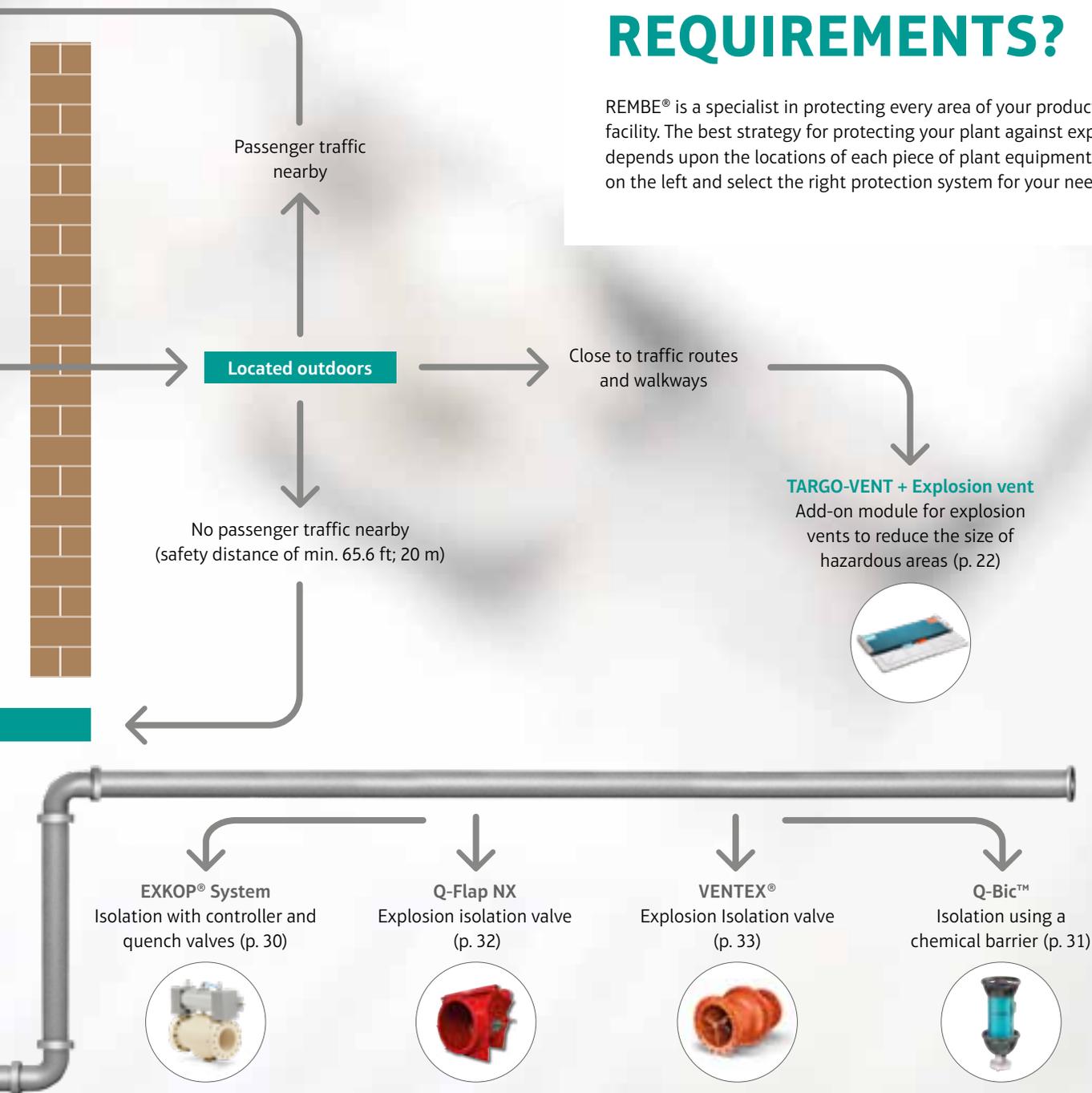
Find the optimum explosion protective system for your entire plant and vessels such as silos, filters, cyclones, separators, mixers, dryers, etc.

\*This diagram is simplified and does not claim to be complete.

Selection guide

# WHICH IS THE BEST REMBE® PRODUCT FOR YOUR REQUIREMENTS?

REMBE® is a specialist in protecting every area of your production facility. The best strategy for protecting your plant against explosions depends upon the locations of each piece of plant equipment. Start on the left and select the right protection system for your needs.



## Typical Applications for our Products

REMBE® explosion safety products are installed in a wide variety of industries and processes. The following are just a few of many typical applications.

Please note that industrial explosion safety does not follow a standard recipe, but requires a thorough analysis of each installation. We will gladly support you in that effort.

Give us a call at: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)

### Filter

Dust collectors are used to capture dust, which is intentionally or unintentionally generated during the process. Therefore, an increased risk of explosion will be present within the dust collectors especially during the pulse-cleaning of the filter elements. For this reason, dust collectors are generally protected with vent panels. The Q-Box or the Q-Rohr® are commonly used for the dust collectors located indoors. The original flameless venting devices, which were developed by REMBE® in the 1980s, provide a safe release of the explosion from the vessel, and protect the environment at the same time. Detailed information about this technology can be found starting on page 24.

If transport or traffic routes are located in the vicinity of the explosion venting, a vent panel in combination with the TARGO-VENT (p. 22) add-on module should be utilized, in order to deflect the flame and shock wave of the explosion to safe areas.

Protective systems are utilized for isolation in order to prevent explosion propagation into interconnected areas. In this example, a Q-Flap NX inlet isolation device is used for inlet isolation (p. 32) and a Q-Box LF or VENTEX® for the clean air return.



### Silo

There is a particularly high risk of a combustible dust explosion during the filling of a silo due to the turbulent dust-air mixture created. This is precisely the time and place that an explosion in a silo is most likely to happen.

In outdoor areas, silos are usually relieved with vent panels (starting p. 12) – depending on the kind of filling. There are a number of different panels that might be used (see table on page 20). Q-Box (p. 28) or Q-Rohr®(p. 26) are installed for safe indoor venting.

Explosion isolation is typically achieved with quench valves (p. 30). These completely seal the pipes within a few milliseconds, thus inhibiting the explosion from further propagating.





The stainless steel mesh of the Q-Rohr® and Q-Box indoor venting devices protects installations and their surroundings from the impact of an explosion.

## Elevators

Elevators convey large amounts of (flammable) bulk materials, and thus pose a high risk for explosion. The size and strength of the bucket elevator determine the number and mounting distance for the required protective systems, depending on the type of bulk material.

Outdoor elevator shafts are commonly protected with vent panels (starting p. 12), indoors Q-Boxes are applied (p. 28). A combination of conventional and flameless venting is also feasible, depending on the conditions of the installation location. The isolation of the upstream and/or downstream conveyors is typically achieved with rotary valves or Q-Bic™ chemical barriers (p. 31). Additionally, it is also possible to utilize quench valves to prevent the explosion propagation through connected aspiration lines.



## Spray dryer

Usually, spray dryers are protected with a combination of explosion isolation systems and vent panels. If an explosion cannot be safely relieved with vent panels, a flameless venting device will be used. To prevent explosion propagation, the connecting pipes are usually isolated with Q-Bic™ chemical barrier (p. 31).

For hygienically demanding processes, specially designed EGV HYP (p. 18) and ERO (p. 19) vent panels are installed. Using these panels, bacteria formations, deposits and cross-contaminations don't stand a chance. KAD covers (p. 23) are installed on the vent ducts to protect against weather influences, improve hygienic conditions and to reduce noise emissions.

The combination of ERO (p. 19) and Q-Rohr® (p. 26) also enables flameless venting for these hygienic applications.





# CONVENTIONAL EXPLOSION VENTING WITH EXPLOSION VENTS

## Explosion vents

Should an explosion occur, an explosion vent will rupture and protect the vessel by reducing the overpressure within it and releasing the explosion into the surrounding environment in a controlled manner.

Industrial processes vary widely depending on the sector and the product. No two processes are identical. For this reason, REMBE® supplies explosion vents in a variety of shapes, materials, temperatures, pressure resistances and many other specifications.

## Explosion venting applications

When plant equipment is located outside, explosion vents are used for explosion safety. Explosion vents **safeguard outdoor equipment** such as silos, filters, elevators, bunkers, cyclones and other dust-handling facilities.



### Advantages of using high-quality explosion vents

- Easy to install
- No maintenance required
- Long service life
- Quick to replace after an explosion event

Explosion vents – the reliable and cost-effective solution for explosion safety.

Explosion vents from REMBE®:

### Highest quality guaranteed – from standard versions to individual customized solutions

REMBE® offers you the optimum explosion vent for all applications and operating conditions.

Whether your application involves a sanitary process or extreme conditions, such as rapidly fluctuating pressure cycling, low vacuum and overpressure or high operating temperatures, **we can supply you the optimum explosion vent for your requirements.**

You will receive a complete protection concept that is precisely adapted to your process.

All REMBE® explosion vents are certified in accordance with ATEX Directive 2014/34/EU and EN 14797. NFPA compliant.

#### Product selection guide for explosion venting with REMBE® explosion vents

Application	Operating conditions	Product
Silo/Vessel	Mechanical filling	<b>EGV</b> (p. 14)
	Pneumatic filling	<b>EDP</b> (p. 15)
Filter/Cyclone	Overpressure or low vacuum	<b>EGV</b> (p. 14)
	Low to medium vacuum or pressure cycling	<b>EDP</b> (p. 15)
	High vacuum or pressure cycling	<b>ODV</b> (p. 17)
	Hygienic requirements and high vacuum	<b>ERO</b> (p. 19)
	Large vent areas with low burst pressure and medium or high vacuum	<b>MDX</b> (p. 16)
Elevator/Chain conveyor	All	<b>EGV</b> (p. 14)
Spray dryer	Hygienic requirements to avoid cross contamination	<b>EGV HYP</b> (p. 18)
	No hygienic requirements	<b>EGV</b> (p. 14)
Screen/Sieve	Slight vibration	<b>EGV</b> (p. 14)
	Strong vibration	<b>EDP</b> (p. 15)
Gas motors	All	<b>EDP*</b> (p. 15)

\*Type selection based on process temperature.



Optimum protection for storage silos and elevators: the REMBE® EGV explosion vent.

## EGV

For zero to low pressure or vacuum

### Applications

From spray dryers, elevators and chain conveyors to screens with light vibration, silos with mechanical filling and cyclones – the REMBE® EGV explosion vent is suitable for use in a wide range of applications **in all sectors** for both non-pressurized processes and processes with low vacuum or overpressure (**up to 50% of static burst pressure**). The standard burst pressure is 0.1 bar at 71.6 °F (22 °C).

### Mechanism

When pressure rises, the EGV explosion vent opens at the defined breaking point and releases pressure out of the vessel into the surrounding area.

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X



NFPA  
compliant

SIL equivalent SIL 4

All versions of the EGV are available with **insulation** to prevent the build-up of deposits as a result of temperatures falling below dew point.



### Your advantages

- **Maximum venting capacity and full bore opening** due to low surface weight.
- **High stability and quick opening speed** through integrated bionic structure.
- Direct installation of the EGV explosion vent, even on cylindrical vessels, **prevents bacteria formation**. No complicated flange construction required.
- **Adapts perfectly to your process** due to the wide range of EGV shapes available.
- **Quick and easy installation** because REMBE® EGV explosion vent is torque independent. No additional counter frame required.
- **Significant space savings** due to the integrated gasket and frame in the explosion vent.
- **Guaranteed leaktight integrity**. Independently verified.

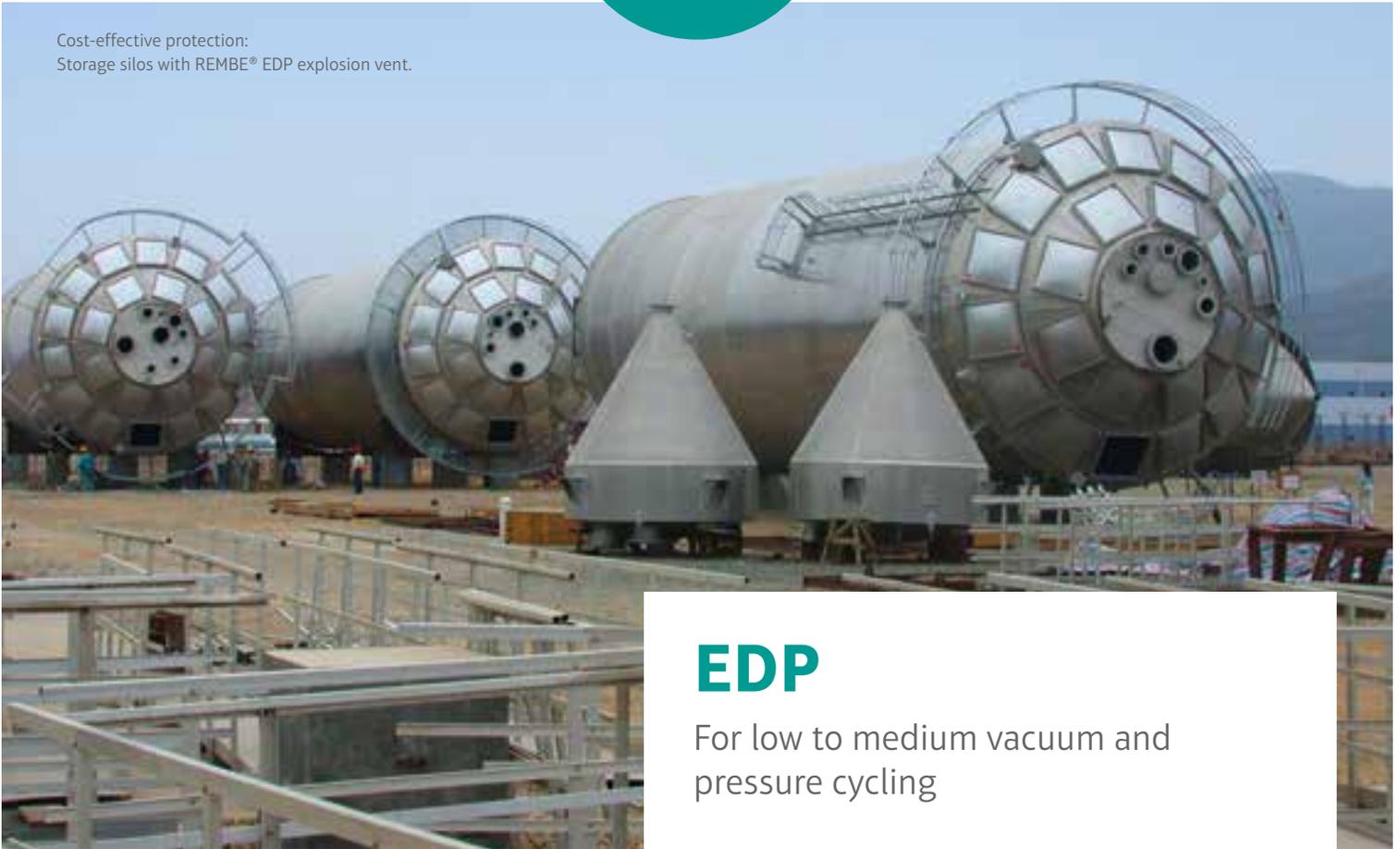


Angular, round, semi-circular or trapezoidal, the the REMBE® EGV is available in a range of different shapes and can be adapted to cylindrical vessels, if necessary.

You can find an overview of the standard sizes for the EGV on page 20. Associated accessories can be found starting on page 23. You can find detailed information and contact details for inquiries at [www.rembe.us](http://www.rembe.us). Give us a call at: T + 1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)



Cost-effective protection:  
Storage silos with REMBE® EDP explosion vent.



## EDP

For low to medium vacuum and pressure cycling

### Applications

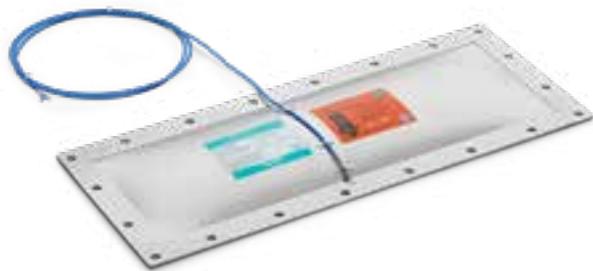
The domed, single layer REMBE® EDP explosion vent is suitable for use in processes with medium vacuum or overpressure (**up to 70 % of minimum response pressure (pstat)**) and slight pressure cycling. It is particularly suitable for vessels with pneumatic filling equipment, filters, cyclones and sieves with strong vibration. The standard explosion pressure is 0.1 bar at 71.6 °F (22 °C).

### Mechanism

When pressure rises, the EDP explosion vent opens and releases pressure out of the vessel into the surrounding area.

### Your advantages

- The domed construction provides **high stability and pressure cycling resistance**.
- **Quick and easy installation** because EDP is torque independent. No additional counter frame required.
- **Significant space savings** due to the integrated gasket and tensioning frame in the explosion vent.



REMBE EDP explosion vent with signaling: quick and easy to install.

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X



NFPA  
compliant

SIL equivalent SIL 4

You can find an overview of the standard sizes for the EDP on page 20. Associated accessories can be found starting on page 23. You can find detailed information and contact details for inquiries at [www.rembe.us](http://www.rembe.us). Give us a call at: T + 1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)





## MDX

For low burst pressure  
with high vacuum

### Applications

The REMBE® MDX vent panel is specifically designed for filters with high vacuum requirements and large vent areas. With a standard burst pressure of 0.05 bar at 71.6 °F (22 °C), the MDX can also be used in other system components with a medium to high pressure, as well as for vacuum and alternating pressures.

**The MDX vent panel, with its unique one-piece design provides a combination of precise opening characteristics with high vacuum resistance and the lowest possible weight per surface area unit.**

### Mechanism

In the event of a sudden pressure increase, the MDX vent panel will open and release the pressure from the vessel .

### Your advantages

- **Reduction of deposits:** the design guarantees high pressure resistance without the need for extra vacuum support.
- **Weight savings** through three-dimensional reinforcement corrugations.
- **Low initial purchase costs:** single-layer vent panel.



The design of the MDX makes it the ideal vent panel, even under high vacuum, lowest burst pressure and alternating pressure situations.

You can find detailed information and contact details for inquiries relating to our MDX explosion vents at [www.rembe.us](http://www.rembe.us). Associated accessories can be found starting on page 23. Give us a call at: +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)





## ODV

For high to full vacuum and pressure cycling

### Applications

The REMBE® ODV explosion vent is used under demanding vacuum to overpressure cyclic operating conditions. Designed for working pressures of up to **80 % of static burst pressure**.

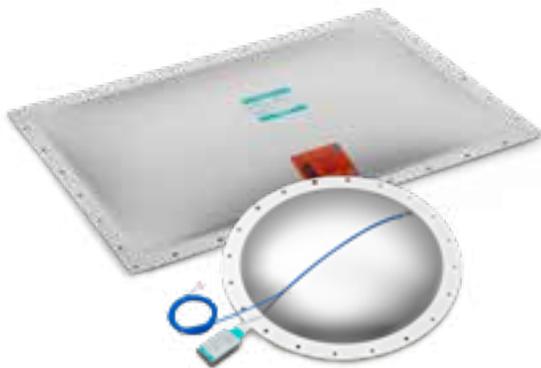
The ODV is ideal for use in applications such as filters with frequent jet-pulse cleaning, high vacuum or suction conveyors. It is **vacuum resistant** and the standard explosion pressure is 0.1 bar at 71.6 °F (22 °C).

### Mechanism

When pressure rises, the ODV explosion vent opens and releases pressure out of the vessel into the surrounding area.

### Your advantages

- **Low response pressure with full vacuum resistance is possible.**
- High working pressure resistance of the explosion vent offers **maximum productivity for your processes.**
- Triple layered domed construction ensures **high-pressure cycling resistance and exceptional service life.**
- **Round versions and special customized solutions** possible.



The REMBE® ODV explosion vent consists of an upper layer, a sealing element and a vacuum support layer.

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X



NFPA  
compliant

SIL equivalent SIL 4

## ODU

For fluctuating overpressure

The triple-layer REMBE® ODU explosion vent is ideal for applications that involve pressure cycling but no vacuum. In this version, the vacuum support layer section of the ODV is replaced by a supporting lower layer.

You can find an overview of the standard sizes for the ODV on page 20. Associated accessories can be found starting on page 23. You can find detailed information and contact details for inquiries at [www.rembe.us](http://www.rembe.us). Give us a call at: T + 1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)



## Vent panels for hygienically demanding processes

The REMBE® EGV HYP and ERO vent panels are designed to meet production facilities' elevated hygienic requirements.

### EGV HYP

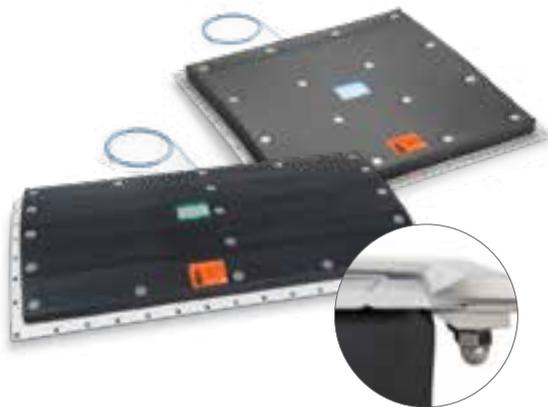
For zero to low negative pressure applications

Certified in accordance with EHEDG (European Hygienic Engineering & Design Group)

#### Applications

The REMBE® EGV HYP was specifically designed for hygienically demanding systems in the food and pharmaceutical industry, and is often utilized in critical systems such as spray and fluidbed dryers. **The special feature:** The patented, full-flat, chamfered gasket system has an internal sealing area that is flush with the vent panel, and facilitates the avoidance of cross-contaminations.

The EGV HYP explosion vent can also be pre-bent to conform to cylindrical vessels.



The innovative sealing concept of the EGV HYP is very effective in preventing deposits and bacterial growth.

#### Mechanism

In the event of a sudden pressure increase, the EGV HYP vent panel will open and release the pressure from the vessel.

#### Your advantages

- Hygienic design ensures consistently **high quality of product**.
- **Protects against cross-contamination** when changing products.
- Enables **CIP cleaning**.
- **Increased service life** of the vent panel under alternating temperature and pressure stresses with the integrated bionic structure.
- **Reduces sound emissions** (e.g. from hammers) at the venting channels.

#### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X



NFPA  
compliant

SIL equivalent SIL 4

You can find detailed information and contact details for inquiries relating to EGV HYP explosion vents at [www.rembe.us](http://www.rembe.us). Associated accessories can be found starting on page 23. Give us a call at: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)





## ERO

For low to medium pressure and alternating pressure

The only vent panel with USDA approval

### Applications

The REMBE® ERO sanitary vent panel is utilized in the pharmaceutical, chemical and food industry in a broad range of system areas. The smooth and closed stainless steel membrane, which faces the process, optimally seals the vessel and enables a **sterilization of the vent panel while installed on equipment**. The hygienic and robust design allows for a reliable response, even at the lowest burst pressures.

The working pressure is at 75% of the minimum burst pressure.

### Mechanism

In the event of a sudden pressure increase, the ERO vent panel will open and release the pressure from the vessel.

### Your advantages

- The only vent panel with **USDA approval**.
- **Easy and safe to maintain sterile** through the special design of the ERO.
- **Easy installation** and low maintenance.



In conjunction with the Q-Rohr®, the ERO vent panel even enables flameless venting for hygienically demanding applications.

### Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1538 X



NFPA  
compliant

SIL equivalent SIL 4



You can find an overview of the standard sizes for the ERO on page 20. Associated accessories can be found starting on page 23. Also, you can find detailed information and contact details for inquiries at [www.rembe.us](http://www.rembe.us). Give us a call at : +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)

## All standard sizes and vent areas at a glance.

Rectangular vent panels										
Max. size of wall opening – nominal vent dimensions		Effective venting area								TARGO-VENT (p. 22) Opening angle limiter
		EGV (p. 14) For zero to low pressure or vacuum		EDP (p. 15) For low to medium vacuum and pressure cycling		ODV (p. 17) For high to full vacuum and pressure cycling		KAD (p. 23) weather cover for vent pipes/ducts		
[inch]	[mm]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	
5.1 × 19.7	130 × 500	100.7	650	100.7	650	77.5	500	100.7	650	–
9 × 12	229 × 305	108.5	700	108.5	700	83.7	540	108.5	700	–
5.9 × 23.6	150 × 600	139.5	900	139.5	900	116.3	750	139.5	900	–
7.1 × 16.5	180 × 420	116.3	750	116.3	750	99.2	640	116.3	750	–
10.6 × 18.3	270 × 465	193.8	1250	193.8	1250	155	1000	193.8	1250	–
7.9 × 18.1	200 × 460	142.6	920	142.6	920	122.4	790	142.6	920	–
9.7 × 18.3	247 × 465	170.5	1100	170.5	1100	150.3	970	170.5	1100	–
8.1 × 24	205 × 610	193.8	1250	193.8	1250	155	1000	193.8	1250	–
13.4 × 15.2	340 × 385	201.5	1300	201.5	1300	170.5	1100	201.5	1300	–
12.4 × 16.7	314 × 424	206.1	1330	206.1	1330	178.3	1150	206.1	1330	–
12 × 18	305 × 457	209.6	1350	209.6	1350	186	1200	209.6	1350	–
12.4 × 18.4	315 × 467	227.9	1470	–	–	–	–	–	–	–
9.7 × 24	247 × 610	232.5	1500	232.5	1500	201.5	1300	232.5	1500	–
13.4 × 17.3	340 × 440	230.9	1490	230.9	1490	201.5	1300	230.9	1490	–
15.7 × 15.7	400 × 400	248	1600	248	1600	217	1400	248	1600	–
16.1 × 16.1	410 × 410	260.4	1680	260.4	1680	224.8	1450	260.4	1680	–
15.9 × 16.5	404 × 420	–	–	–	–	232.5	1500	–	–	–
12 × 24	305 × 610	288.3	1860	288.3	1860	248	1600	288.3	1860	<b>X</b>
13.9 × 22.8	354 × 580	317.8	2050	317.8	2050	279	1800	317.8	2050	–
14.8 × 25.8	375 × 655	379.8	2450	379.8	2450	341	2200	379.8	2450	–
17.3 × 23.8	440 × 605	412.3	2660	412.3	2660	372	2400	412.3	2660	–
18.5 × 24	470 × 610	441.8	2850	441.8	2850	403	2600	441.8	2850	–
19.3 × 23.2	490 × 590	448	2890	448	2890	403	2600	448	2890	–
19.7 × 24.4	500 × 620	–	–	–	–	434	2800	–	–	–
11.8 × 39.4	300 × 1000	465	3000	465	3000	426.2	2750	465	3000	–
15.2 × 36.2	386 × 920	–	–	–	–	496	3200	–	–	–
17.9 × 29.9	454 × 760	527	3400	–	–	–	–	–	–	–
22.4 × 24.4	570 × 620	–	–	–	–	496	3200	–	–	–
17.7 × 31.5	450 × 800	558	3600	558	3600	511.5	3300	558	3600	–
23.6 × 23.6	600 × 600	558	3600	558	3600	511.5	3300	558	3600	–
23.2 × 24.4	590 × 620	–	–	–	–	519.3	3350	–	–	–
23.8 × 23.8	605 × 605	–	–	–	–	519.3	3350	–	–	–
22.6 × 25.4	575 × 645	573.5	3700	573.5	3700	527	3400	573.5	3700	–
24 × 24	610 × 610	576.6	3720	576.6	3720	527	3400	576.6	3720	–
18 × 35	457 × 890	635.5	4100	635.5	4100	581.3	3750	635.5	4100	–
25.6 × 25.6	650 × 650	654.1	4220	–	–	–	–	–	–	–
20.5 × 32.3	520 × 820	660.3	4260	660.3	4260	620	4000	660.3	4260	–
14.6 × 48	370 × 1220	697.5	4500	–	–	–	–	–	–	–
25.7 × 25.7	653 × 653	660.3	4260	660.3	4260	604.5	3900	660.3	4260	–
23.6 × 31.5	600 × 800	744	4800	744	4800	682	4400	744	4800	–
28 × 28	710 × 710	775	5000	775	5000	728.5	4700	775	5000	–
24.4 × 32.3	620 × 820	790.5	5100	790.5	5100	736.3	4750	790.5	5100	<b>X</b>
23.1 × 36.2	586 × 920	837	5400	837	5400	775	5000	837	5400	<b>X</b>
19.7 × 43.3	500 × 1100	852.5	5500	852.5	5500	790.5	5100	852.5	5500	–
29.5 × 33.1	750 × 840	976.5	6300	976.5	6300	914.5	5900	976.5	6300	–
24.4 × 40.2	620 × 1020	979.6	6320	979.6	6320	930	6000	979.6	6320	–
31.5 × 31.5	800 × 800	992	6400	992	6400	930	6000	992	6400	–
18 × 59.1	457 × 1500	1061.7	6850	1061.7	6850	984.3	6350	1061.7	6850	–
24 × 44	610 × 1118	1055.5	6810	1055.5	6810	992	6400	1055.5	6810	<b>X</b>
25.4 × 44.5	645 × 1130	–	–	–	–	1054	6800	–	–	–

REMBE® vent panels can be supplied in any desired dimension and with a customized bolt pattern.

## Rectangular vent panels

Max. size of wall opening – nominal vent dimensions [mm]		Effective venting area										TARGO-VENT (p. 22) Opening angle limiter	
		EGV (p. 14) For zero to low pressure or vacuum		EDP (p. 15) For low to medium vacuum and pressure cycling		ODV (p. 17) For high to full vacuum and pressure cycling		KAD (p. 23) weather cover for vent pipes/ducts					
[inch]	[mm]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]		
28.3 × 40.2	720 × 1020	1137.7	7340	1137.7	7340	1077.2	6950	1137.7	7340			–	
30 × 43.9	760 × 1114	1309.8	8450	–	–	–	–	–	–			–	
33.1 × 36.2	840 × 920	1193.5	7700	1193.5	7700	1131.5	7300	1193.5	7700			–	
36.2 × 36.2	920 × 920	1317.5	8500	1317.5	8500	1240	8000	1317.5	8500			X	
18 × 78.7	457 × 2000	1416.7	9140	1416.7	9140	1317.5	8500	1416.7	9140			–	
36.2 × 40.2	920 × 1020	1449.2	9350	1449.2	9350	1364	8800	1449.2	9350			–	
23.1 × 64.2	586 × 1630	–	–	–	–	1379.5	8900	–	–			–	
39.4 × 39.4	1000 × 1000	1550	10000	1550	10000	1472.5	9500	1550	10000			–	
36 × 44	915 × 1118	1581	10200	1581	10200	1503.5	9700	1581	10200			X	
30.3 × 52.8	770 × 1340	1596.5	10300	1596.5	10300	1519	9800	1596.5	10300			–	
40.2 × 40.2	1020 × 1020	1612	10400	1612	10400	1534.5	9900	1612	10400			–	
31.1 × 52.8	790 × 1340	1627.5	10500	–	–	–	–	–	–			–	
23.1 × 74.5	586 × 1893	–	–	–	–	1612	10400	–	–			–	
36.2 × 49.4	920 × 1254	1782.5	11500	1782.5	11500	1705	11000	1782.5	11500			–	
29.1 × 64.2	740 × 1630	–	–	–	–	1774.8	11450	–	–			–	
29.5 × 74.8	750 × 1900	–	–	–	–	2092.5	13500	–	–			–	
44.5 × 44.5	1130 × 1130	1976.3	12750	1976.3	12750	1891	12200	1976.3	12750			–	
33.9 × 59.8	860 × 1520	2015	13000	–	–	–	–	–	–			–	
37 × 56.7	940 × 1440	2092.5	13500	2092.5	13500	2015	13000	2092.5	13500			–	
37 × 63	940 × 1600	2325	15000	–	–	–	–	–	–			–	
43.7 × 57.5	1110 × 1460	2480	16000	2480	16000	2418	15600	2480	16000			–	
36.2 × 75.6	920 × 1920	2712.5	17500	2712.5	17500	2635	17000	2712.5	17500			–	
39.4 × 78.7	1000 × 2000	3100	20000	–	–	–	–	–	–			–	

## Round vent panels

DN		Effective venting area										KAD (p. 23) weather cover for vent pipes/ducts			
		ODV (p. 17) For high to full vacuum and pressure cycling		ERO (p. 19) For low to medium pressure, and alternating pressures				EDP (p. 15) For low to medium vacuum and pressure cycling		EGV (p. 14) For zero to low pressure or vacuum					
				< 1000 mmWC		> 1000 mmWC									
[inch]	[mm]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[sq in]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]	[sq in]	[cm <sup>2</sup> ]		
7.9	200	38	245	52.7	340	38	245	52.7	340	52.7	340	–	–		
11.8	300	93	600	116.2	750	93	600	116.2	750	116.2	750	–	–		
15.7	400	155	1000	186	1200	155	1000	186	1200	186	1200	186	1200		
19.7	500	257.3	1660	294.5	1900	257.3	1660	294.5	1900	294.5	1900	294.5	1900		
23.6	600	387.5	2500	418.5	2700	387.5	2500	418.5	2700	418.5	2700	418.5	2700		
27.6	700	542.5	3500	589	3800	542.5	3500	589	3800	589	3800	589	3800		
31.5	800	713	4600	775	5000	713	4600	775	5000	775	5000	775	5000		
				< 500 mmWC											
				[sq in]	[cm <sup>2</sup> ]										
35.4	900	914.5	5900	976.5	6300	976.5	6300	976.5	6300	976.5	6300	976.5	6300		
39.4	1000	1147	7400	1209	7800	1209	7800	1209	7800	1209	7800	1209	7800		
43.3	1100	1387.3	8950	1472.5	9500	1472.5	9500	1472.5	9500	1472.5	9500	1472.5	9500		
47.2	1200	1550	10000	1751.5	11300	1751.5	11300	1751.5	11300	1751.5	11300	1751.5	11300		
				< 200 mmWC											
51.2	1300	1937.5	12500	2046	13200	2046	13200	2046	13200	2046	13200	2046	13200		
55.1	1400	2325	15000	2387	15400	2387	15400	2387	15400	2387	15400	2387	15400		

The special EGV HYP, ERO and MDX vent panels are available in almost any size. In addition, the following standard sizes provide a great economic value: 23.1 × 36.2 inch (586 × 920 mm), 36.2 × 36.2 inch (920 × 920 mm), 39.4 × 39.4 inch (1000 × 1000 mm), 24 × 44 inch (610 × 1118 mm).

Without TARGO-VENT the flame creates a dangerous situation in operating areas.



With TARGO-VENT the flame is deflected into safe areas.



Simplified image

## TARGO-VENT

Add-on module for explosion vents to divert explosion hazards to a safe area

In the event of a dust explosion occurring in an enclosure located outside of a plant, explosion vents open and release the explosion flame and pressure wave into the environment. Adequate safety areas are crucial. These areas must be kept free of buildings and be out of bounds to both vehicles and pedestrians. These empty areas cannot be used commercially but still incur operating costs. REMBE® TARGO-VENT limits the opening angle of an explosion vent in order to protect people, vehicles or subsequently erected buildings. By diverting explosion hazards to a safe area, TARGO-VENT helps you increase usable operating space while providing optimum protection against the effects of an explosion.

### Applications

Ideal for rectangular explosion vents:

- venting into areas used by vehicles or pedestrians.
- used in outdoor applications.
- releasing into previously clear areas which have subsequently been built upon.

### Mechanism

TARGO-VENT limits the opening angle of the explosion vent and guides the explosion pressure wave, flames and heat into defined areas. This minimizes the size of the safety areas required.

### Your advantages

- Diverts explosion – **more productive use of valuable operating areas.**
- **Cost effective protection** of infrastructure.
- **Safe traffic routes for people and vehicles** while simultaneously reducing the safety area required.
- Retrofitting with TARGO-VENT provides **greater safety for existing installations.**
- **Maintenance-free and long service life** through the use of stainless steel.



### Certification



ATEX  
EC type examination  
certificate no.  
FSA 13 ATEX 1637



NFPA  
compliant

You can find an overview of the standard sizes for the TARGO-VENT on page 20. You can find detailed information and contact details for inquiries at [www.rembe.us](http://www.rembe.us). Give us a call at: +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)



# ACCESSORIES

For optimum adaptation of explosion vents to meet your requirements

## Signaling units from REMBE®

Signaling units enable you to shut down a plant quickly in the event of an explosion and also trigger isolation systems which protect adjacent parts of the plant. Automated processes also use intelligent signaling systems to monitor the status of the entire plant and any disruptions that occur. This is not just essential in venting ducts, it can also play an important role in free venting.

**Signaling units can be retrofitted onto either round or rectangular vents that have already been installed.**

For evaluation of the signals, we offer isolation amplifiers with relay outputs which guarantee an intrinsically safe closed-circuit current. The potential-free relay contact ensures that the plant is deactivated safely and the alarm functions correctly.

## SK signaling unit

The SK signaling unit uses the **closed-circuit current principle**. A signaling cable is integrated onto the explosion vent during the manufacturing process to create a highly reliable unit. When the explosion vent opens, the signaling cable circuit is interrupted.

## BIRD signaling unit

The BIRD signaling unit contains a **ceramic bar with integrated electrical conductors**. When the explosion vent opens, the circuit breaks. The standard version of the BIRD unit can withstand temperatures of up to 302 °F (150 °C). A high temperature version, resistant up to 752 °F (400 °C), is also available. The device is mounted using a stainless steel angle and mounting frame.

## RSK signaling unit

The **RSK signaling unit can be retrofitted** to either round or rectangular explosion vents. The signaling cable is fixed in position over the breaking point of the explosion vent. When the explosion vent opens, the RSK signaling cable circuit is interrupted.



## Additional accessories for explosion venting with explosion vents



**Mounting frame and flange**  
Galvanized or stainless steel.

**A range of gaskets for all process conditions**  
For example, for high temperature or sterile requirements.

**Weather resistant insulation**  
Prevent condensation, improve thermal insulation and **up to 50 % noise emissions**. Thermal insulation products reduce expensive energy and temperature losses from the protected vessels and prevent condensation-related product build-up.

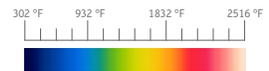
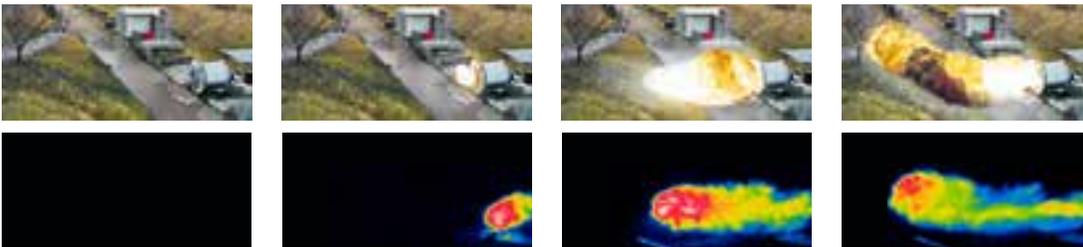
**KAD: weather cover for vent pipes/ducts**  
Reliable protection against penetration by snow, rain and dust with a low response pressure. Also reduces noise during normal operation. Their non-inflammability provides advantages over plastic or polystyrene coverings with regard to the risks of explosion-induced subsequent fires.

You can find an overview of the standard sizes for the KAD on page 20. You can find detailed information and contact details for inquiries at [www.rembe.us](http://www.rembe.us). Give us a call at: +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us)

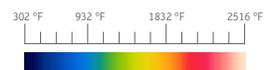
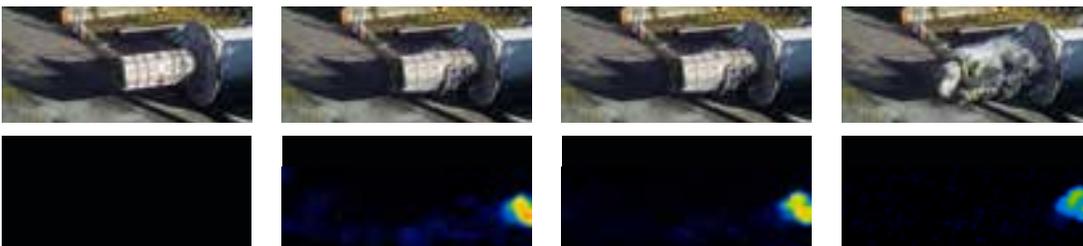




# FLAMELESS EXPLOSION VENTING



Thermographic investigation of a dust explosion: conventional explosion venting with an explosion vent.



Identical explosion with the Q-Rohr®: no heat generated outside the vessel with only a slight pressure rise and minimal noise volume.

## Explosion safety with vent ducts: expensive and unproductive

### The situation:

Indoor plant equipment cannot be protected by explosion vents alone. The dust and flames exiting the vessel pose an enormous threat to both the safety of employees and the plant itself. And secondary explosions resulting from the dust disturbed by the initial explosion are yet another concern. For this reason, vent ducts are often used to channel the pressure wave and flames from an explosion to an outdoor area.

### The problem:

The vent duct solution prevents process-optimized plant design. The longer the venting duct, the stronger the duct and the enclosure itself must be and the higher the associated costs. The reason: the greater the distance of the explosion from its source, the greater the pressure that the duct and the enclosure must withstand.



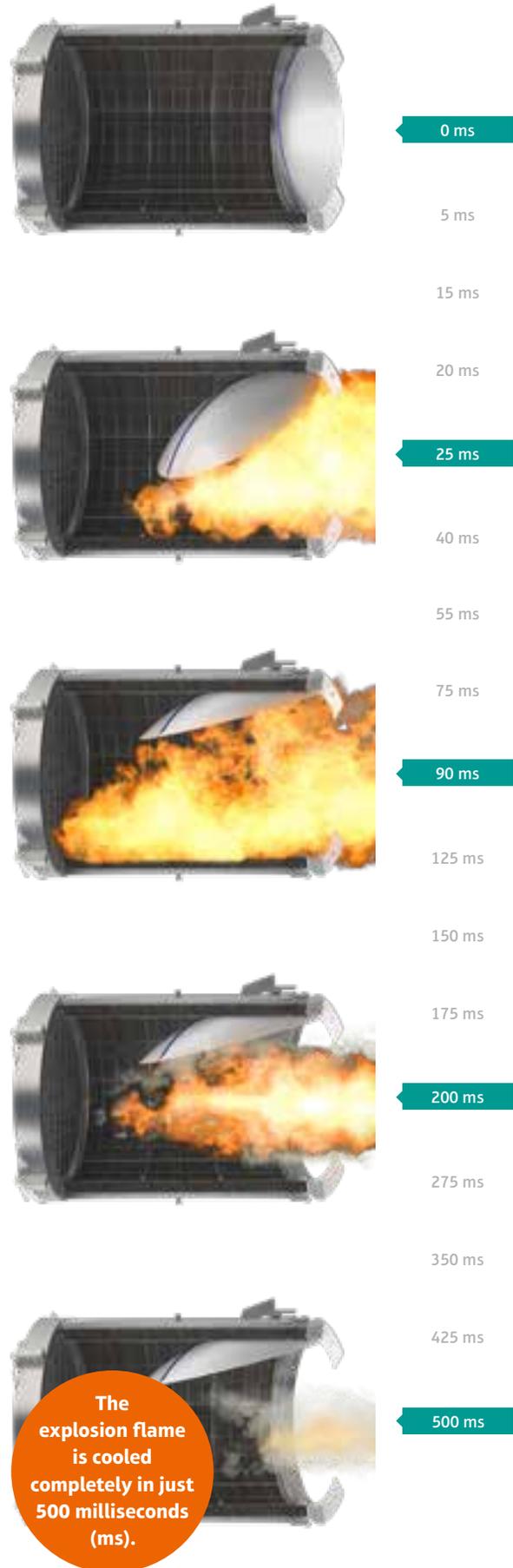
## The cost-effective solution: flameless explosion venting

During flameless explosion venting, the flames are cooled rapidly and efficiently by the steel mesh of the flame absorber and extinguished immediately. No flames and no pressure wave exit the vessel. Plant production can now be designed to create the optimum process conditions. Likewise, the typical pressure wave and noise in the plant are reduced to a barely perceptible level. The Q-Rohr® design guarantees that no burned or combustible materials are ejected. This not only reduces the consequences of the explosion, but also provides the highest level of protection for employees.

## The advantages of flameless explosion venting

Flameless indoor explosion venting consigns expensive protection systems with complicated vent ducts to the history books. Companies are once again free to focus on optimizing the design of their processes and plants for maximum efficiency.

This form of flame- and dust-free explosion venting is **the safest and most cost-effective solution for indoor use.**



The Q-Rohr® stainless steel mesh quenches explosions in just milliseconds.



# Q-ROHR®

Flameless explosion venting for dust and gas explosions

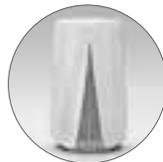


**Safety and operating efficiency go hand in hand.** The Q-Rohr® enables you to implement flame arresting and particulate retention explosion venting in interior plant spaces. No complicated ducts for outdoor venting and/or associated restructuring of production equipment are required. **With the Q-Rohr® there is now nothing to prevent you from using the optimum layout for your processing plant while guaranteeing the best possible solution for explosion safety.** In addition, Q-Rohr® is unrivaled in terms of running costs. Eliminating vent ducts saves you money not only on installation but also on servicing and maintenance.

## Applications

The Q-Rohr® is ideal for indoor plants that are at risk of dust and gas explosions. Many new plants are designed and equipped with the Q-Rohr® since it offers a wide range of flexible installation options. Retrofitting is also simplicity itself. **The Q-Rohr® can be used to protect filters, dryers, cyclones and can be used with gases, hybrid mixtures, metal dusts, melting dusts or fibers.**

Optional sanitary cover prevents accumulation/contamination of the Q-Rohr® mesh flame trap in dusty areas.



## Mechanism

The special stainless steel mesh developed by REMBE® cools the hot flames (up to 2732 °F (1500 °C) or 5432 °F (3000 °C) for metal dusts) extremely efficiently. This reduces the volume of vapor ejected and quenches the explosion.

### Please note!

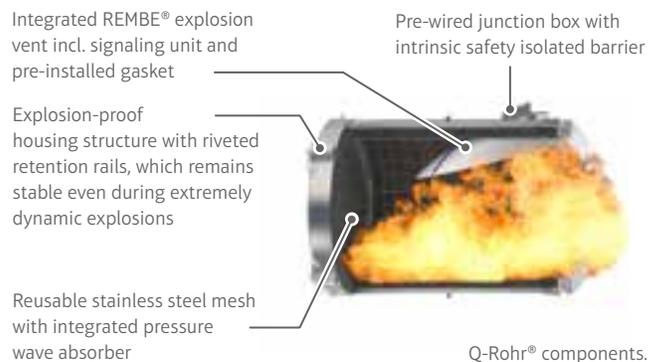
The combination of the Q-Rohr® and isolation systems prevents pressure waves and flames from propagating to other parts of the plant.



Also suitable for metal dusts, gas and hygienic applications



Q-Rohr® is available in sizes DN 200 to DN 800. Customized versions up to DN 1400 are also possible.



Q-Rohr® components.



The perfect solution for indoor explosion safety: Q-Rohr®.

Product separator for a day silo in a Nestlé muesli production facility.

## Your advantages

- **Maximum protection of the surrounding area.**  
Guaranteed flame arresting and particulate retention – no hazardous pressure wave effects.
- **REMBE® is the first manufacturer in the world to be certified for metal dusts.**
- **The complete production process remains in the building.**
- **No running costs** for vent ducts or external maintenance; a visual inspection is sufficient.
- The Q-Rohr® is a **flexible solution** – it can even be used in the middle of your processing plant. Proximity to an external wall is not required.

- **Integrated signaling unit** for reliable monitoring.
- **Reduction of the noise level and pressure rise typically associated with explosions** to an acceptable level.
- **Immediately reusable** and operational after cleaning of the metal mesh and replacement of the explosion vent.

## Your competitive advantages

- **Process-optimized plant layout**
- **No external maintenance costs**

## Certification

### Patents:

DE 38 22 012;  
US 7,905,244



NFPA  
compliant



Germanischer Lloyd  
Q-Rohr® 19496-11 HH



Certified in  
accordance with

EN 16009  
EN 14797



ATEX  
EC type examination  
certificate no.  
IBEXU 11 ATEX 2152 X



ATEX  
EC type examination  
certificate no.  
IBEXU 13 ATEX 2085 X



ATEX  
EC type examination  
certificate no.  
IBEXU 13 ATEX 2086 X



ATEX  
EC type examination  
certificate no.  
IBEXU 14 ATEX 2027 X

SIL equivalent SIL 2

You can find detailed information and contact details for inquiries relating to Q-Rohr® at [www.rembe.us](http://www.rembe.us).  
Give us a call at: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us).



Protection of a crushing plant in the recycling industry

# Q-BOX



Cost-effective indoor explosion venting for dust explosions

## Applications

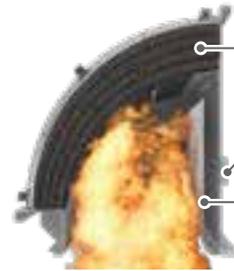
The REMBE® Q-Box is designed for plants that are at risk of dust explosions: wherever there are **filters, elevators, silos** or other equipment with low rigidity and large explosion venting areas that are **handling dust with  $K_{st}$  values up to 200 bar/ms.**

The sanitary cover protects the Q-Box against dust from external sources.



## Mechanism

The Q-Box guarantees safe explosion venting in working areas. Like the Q-Rohr®, the flames are instantly quenched inside the Q-Box by efficient cooling.



- Stainless steel dust filter with integrated pressure wave absorber
- Pre-wired junction box with intrinsic safety isolated barrier
- Integrated REMBE® explosion vent incl. signaling unit and pre-installed gasket

Q-Box components.



Also suitable for outdoor applications!

Easy retrofitting:  
The dimensions of the Q-Box match the dimensions of REMBE® standard explosion vents.

## Please note!

The combination of the Q-Box and isolation systems prevents pressure waves and flames from propagating to other parts of the plant.

## Your advantages

- Flexible use of the Q-Box permits **process-efficient plant design.**
- **Reduces noise levels.**
- **Maximum protection of the surrounding area.** Neither heat, dusts nor a dangerous pressure wave emerge from the vessel – everything stays in the Q-Box.
- **Cost-effective alternative to venting ducts.** No running costs for venting ducts and external maintenance; a visual inspection is sufficient.
- **Integrated signaling unit** for reliable monitoring.
- **Flexible solution for indoor and outdoor use.**
- **Simple retrofitting to existing explosion vent installations.**

## Certification



SIL equivalent SIL 2

## Your competitive advantages

- Process-optimized plant layout
- No external maintenance costs

You can find detailed information and contact details for inquiries relating to Q-Box at [www.rembe.us](http://www.rembe.us). Give us a call at: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us).

# EXPLOSION ISOLATION

## What is explosion isolation?

The objective of explosion isolation or decoupling is to **protect adjacent parts of the plant and prevent the explosion from propagating.**

Explosion isolation is mandatory – secondary explosions in interconnected vessels create a high risk environment.

## Why is isolation so important?

In practice, many vessels, silos and devices are connected by pipes, pneumatic conveyors and dust extraction or aspiration lines. If a dust explosion occurs, the flames and pressure waves can spread through these conduits to other parts of the plant. Pre-compression and flame jet ignition exacerbate the explosion in connected vessels. The result is a series of secondary explosions that cause even more catastrophic damage.

**An isolation system prevents explosions from propagating and thus minimizes the consequences of an explosion. It ensures optimum protection for adjacent parts of the plant.**

## Active and passive isolation systems

Isolation systems can be either active or passive. **Passive isolation systems** react simply due to the effect of the explosion. Their structural design prevents flames and pressure waves from spreading. **Active systems** have detectors or sensors which register the pressure rise or flames and trigger countermeasures, e.g. closing a valve.

## Different types of isolation

Explosion isolation systems use components such as quench valves and inlet isolation devices or valves. Chemical extinguishing barriers are also commonly used to smother the explosion flames (see page 31 for more information about “explosion suppression”). Valves and extinguishing barriers are capable of isolating components in both directions simultaneously.



Explosion safety from REMBE® is more than an individual product – it is always a complete solution. There is no other way that we can guarantee the safety of your employees and provide full protection for your plant. This is why venting and isolation must always work hand-in-hand for effective explosion safety – no ifs, ands or buts.

## Product selection guide for isolation systems

Applications	EXKOP® QV II/QV III (p. 30)	Q-Flap NX NOVEx (p. 32)	VENTEX® (p. 33)	Q-Bic™ (p. 31)
Vertical pipes	✓		✓	✓
Horizontal pipes	✓	✓	✓	✓
Pneumatic conveyor lines	✓			✓
Aspiration lines	✓	✓	(✓)	✓
Chutes and rectangular ducts				✓
Air intake openings	✓	(✓)	✓	
Mechanical conveyors				✓
Multi-inlet pipes	(✓)			✓

(✓) = May only be used in special cases.

Isolation of a pipe with  
REMBE® EXKOP QV II.

## EXKOP® SYSTEM

Space-saving, bidirectional isolation

The EXKOP® system isolates plant equipment in both directions and comprises a self-monitoring EXKOP® controller with data storage and one or several quench valves.

### Applications

EXKOP® systems are suitable for **filling lines, aspiration lines and pipes, pneumatic conveyor lines and air intake openings**. In addition to operating as a decoupling system for dust-bearing plants, the EXKOP® system can also be used as a spark arrester or overpressure limiter.

### Mechanism

In the event of an explosion, the EXKOP® controller receives a trigger signal (e.g. from the signaling unit from a Q-Rohr® or explosion vent, from a pressure switch or spark detector) and activates the connected EXKOP® quench valves. These quench valves close within a few milliseconds and thus protect adjacent plant components. After being triggered, the quench valves can be put back in operation once again at the touch of a button.

The EXKOP® system is ideal in combination with explosion vents or flameless explosion venting solutions.



The EXKOP® system comprises a controller and one or several quench valves.

## Create your perfect isolation solution

### EXKOP® controller

Product	Up to 2 quench valves	Up to 3 quench valves	More than 3 quench valves	Configurable in- and outputs
EXKOP® mini	✓			✓
EXKOP® TriCon	✓	✓		✓
EXKOP® II	✓	✓	✓	✓



### EXKOP® quench valve

Product	Pipe diameter up to 250 mm	Pipe diameter greater than 300 mm	Installation in hygienic areas
EXKOP® QV II	✓		✓
EXKOP® QV III		✓	✓

## Certification



ATEX  
EC type examination  
certificate no.  
FSA 04 ATEX 1537 X  
FSA 15 ATEX 1659 X



NFPA  
compliant

## Your advantages

- **Effective protection through high-speed detection** of explosion events.
- **Returns to operation again immediately** after triggering.
- **Self-monitoring safety electronics with operating data storage.**
- Modem-compatible system analysis allows for **remote maintenance.**
- **System status or error messages reported immediately** via the operating and display panel.

- Processes wide range of trigger signals for **easy retrofitting to existing plants.**
- **Fail Safe mechanism** automatically closes the valve if the power / compressed air fails or the valve is manipulated.

### Your competitive advantages

- **Reliable, process-optimized protection** against explosions in adjacent plant components.
- **Avoid downtime** after the mechanism is triggered.

Coming  
soon

## EXPLOSION SUPPRESSION 4.0

The new REMBE® Q-Bic™

The REMBE® engineering team, under the leadership of Dr.-Ing. Johannes Lottermann and Roland Bunse, is currently developing a new explosion isolation and suppression solution for your applications.

We are placing the **same high demands on this product in terms of quality and reliability**, that you are accustomed to with all other REMBE® systems. **You'll be absolutely amazed.**

**Contact us today to learn more!**

You can find detailed information and contact details for inquiries relating to the EXKOP® system and Q-Bic™ at [www.rembe.us](http://www.rembe.us). Give us a call at: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us).



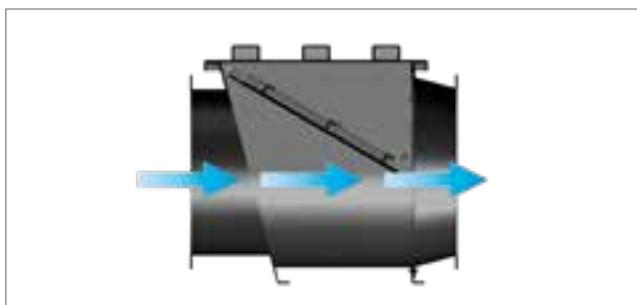
# Q-FLAP NX NOVEx

Cost effective passive isolation of dust collectors and cyclones

## Applications

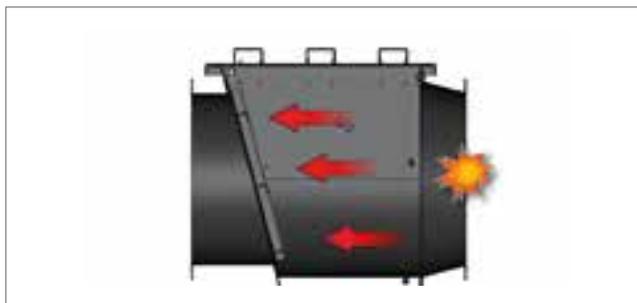
Q-Flap NX explosion isolation valve can be used to isolate explosions effectively in virtually all industries. The Q-Flap NX is suitable in filter lines with horizontal ductwork.

## Mechanism



### Normal operation

During normal operation, the Q-Flap NX valve remains opened due to magnets integrated inside the valve. The flap will close in the event of an explosion.



### Explosion event

In the event of an explosion in any of the downstream equipment, the pressure wave will propagate towards the Q-Flap NX. This pressure wave will force the flap closed, preventing the explosion from propagating to other upstream processes. Employees working at capturing points or system components upstream of the Q-Flap NX are protected against the effects of the explosion. The flap locking mechanism prevents the flap from reopening shortly after the explosion due to the low pressure created in its aftermath.

## Your advantages

- Meets or exceeds NFPA standard 69 requirements.
- Fully certified in accordance with ATEX requirements.
- Flexible use in your process: Q-Flap NX is available for all standard nominal diameters up to DN 1000.
- Inspection cover opens easily for maintenance without completely removing the valve.
- Is suitable for ST1-ST3 applications, including metal dusts.
- Monitoring of flap position and dust accumulation are standard.
- Other options available upon request.



Q-Flap NX ensures reliable explosion isolation to protect your plant and minimize the effects of an explosion.

## Certification



ATEX  
EC type examination  
certificate no.  
LOM11ATEX7047X



Meets the  
requirements of  
NFPA 69

You can find detailed information and contact details for enquiries relating to the Q-Flap NX isolation system at [www.rembe.us](http://www.rembe.us). Give us a call on: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us).



# VENTEX®

## Isolation with explosion isolation valves

VENTEX® explosion isolation valves provide another option for explosion isolation.

VENTEX® explosion isolation valves can be controlled with or without external energy and offer simple and reliable explosion safety due to their extremely low response pressure and ease of maintenance.

### Applications

VENTEX® can be used in plants that process combustible dusts (including metal dusts), gases or hybrid mixtures.

Common application areas include the pharmaceutical industry, chemical/petrochemical companies and research laboratories.



VENTEX® – the ideal explosion safety valve for combustible dusts.

### Certification



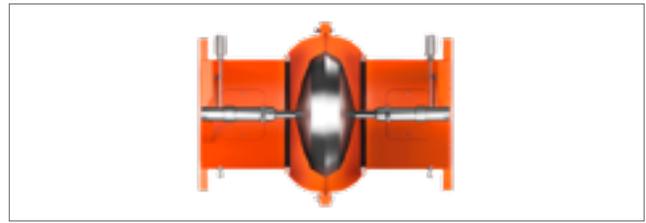
NFPA compliant



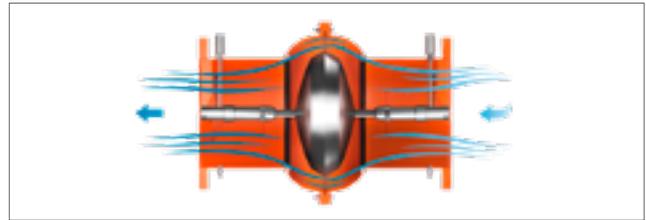
ATEX EC type examination certificate no. FSA 12 ATEX 1623 X

### Mechanism

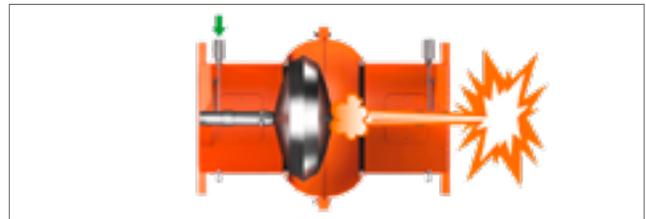
Example using the VENTEX® ESI-E/D: explosion isolation valve as an one-way or two-way acting system without external energy.



**Idle state** – When there is no flow of air, the closing device is in the open position.



**Normal operation** – Air flows around the open closing device.



**Explosion event** – The pressure wave pushes the closing device against a seal, locking the valve and effectively preventing the spread of flames and pressure.

### Your advantages

- Low response pressure
- Short mounting distance



You can find detailed information and contact details for inquiries relating to the VENTEX® explosion safety valve at [www.rembe.us](http://www.rembe.us). Give us a call at: T +1 704 716 7022 or contact us via email: [info@rembe.us](mailto:info@rembe.us).

# WHAT CUSTOMERS AND EXPERTS ARE SAYING ABOUT REMBE®

## REMBE®: Constant Research and Development

*“Explosion safety products from REMBE® meet the highest safety and quality standards because the company consistently focuses on customers' needs, product inventions and their consulting approach. It participates in research and development projects run by the FSA and thus contributes to improving the state of the technology. REMBE® invests heavily in testing its systems and therefore has an excellent understanding of its possibilities and limitations. The workers in its production department receive special training so that they know exactly what the products they manufacture will be used for later. They are fully aware that explosion safety has to be taken very seriously.”*

*Prof. Dr. Siegfried Radandt (Managing Director of the Research Establishment for Applied System Safety and Health (FSA))*



## Always a step ahead

*“REMBE® explosion safety solutions are characterized by a high level of innovation. Only recently, our companies worked together as partners to launch an innovative solution for protecting pneumatically filled silos. This solution saves our customers an enormous amount of money and maximises protection against explosions.”*

*Gerhard Nied (Director of Technology at AZO)*



## Trust the professionals – trust REMBE®

*“Explosion safety is an issue in every industry, from wood and chemicals to food and pharmaceuticals – it is often possible to minimize the risk of explosion. However, it is almost impossible to completely eliminate the hazard entirely. This is why it is important to take action before disaster strikes and trust the professionals in this vital area. Unfortunately, too many companies still fail to focus on providing the correct protection and every year people die as a consequence. In addition, the commercial damage suffered by plant operators is often devastating. The specialists from REMBE® are an excellent choice if you are interested in reliable and cost-effective explosion safety.”*

*Richard Siwek (Owner of the FireEx Group)*



## REMBE® products: durable, effective and affordable

*“We often use REMBE® explosion vents for explosion safety in our outdoor filter plants. The explosion vents are durable and easy to install, which makes them an optimum solution for our needs. The purchased products we use in our filters must also comply with high quality standards. REMBE® fully satisfies all our requirements. Increasingly, we are fitting our indoor filter plants with Q-Rohr® protection systems. Simple, effective, affordable and space-saving, they allow our customers to integrate the filter into the production process with maximum efficiency. Both the filter and the surrounding area are optimally protected.”*

*Klaus Rabenstein (Explosion Safety Specialist at Herding)*

# GLOBALLY LOCAL

## REMBE® locations

We have founded a number of companies around the world to provide you with local service. In addition, REMBE® is represented in more than 80 countries globally by well-known and long-standing partners.

Find the representative responsible for your country at: **T +1 704 716 7022, info@rembe.us or www.rembe.us**



### Tailor-made solutions from REMBE®

*“The key advantage of working with REMBE® is not just the extremely safe design of their explosion safety solutions but also the way they take into account your individual operating requirements. For example, when protecting our production plants REMBE® engineers also consider our high standards in the area of hygiene and offer an appropriate version of the product. As a dairy company, this is absolutely mandatory for us and our customers.”*

Lars Dammann (Head of Occupational Health and Safety/Environment at DMK Deutsches Milchkontor)

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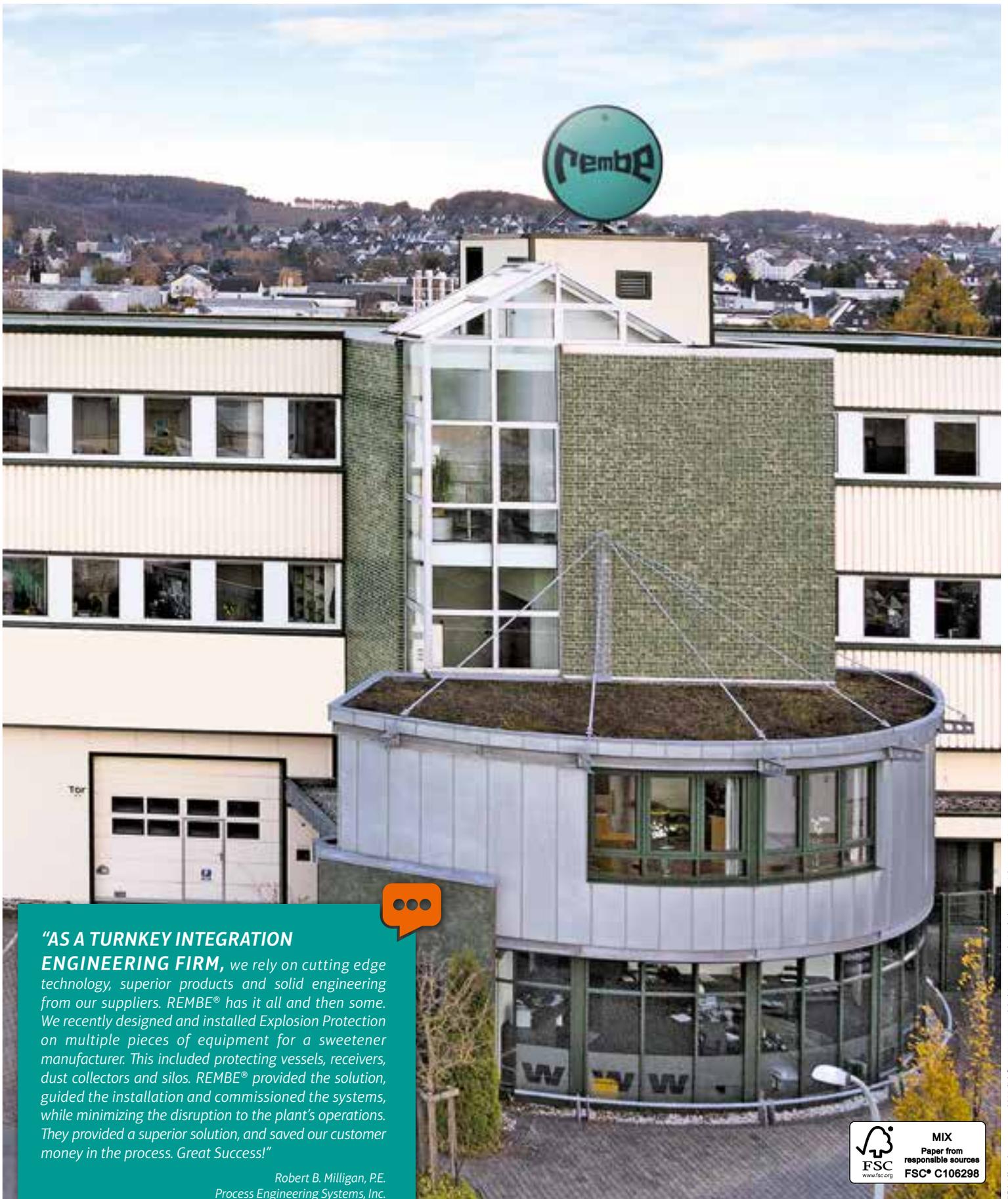
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**“AS A TURNKEY INTEGRATION ENGINEERING FIRM,** we rely on cutting edge technology, superior products and solid engineering from our suppliers. REMBE® has it all and then some. We recently designed and installed Explosion Protection on multiple pieces of equipment for a sweetener manufacturer. This included protecting vessels, receivers, dust collectors and silos. REMBE® provided the solution, guided the installation and commissioned the systems, while minimizing the disruption to the plant’s operations. They provided a superior solution, and saved our customer money in the process. Great Success!”

Robert B. Milligan, P.E.  
Process Engineering Systems, Inc.



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