EXPLOSION PROTECTION SOLUTIONS

INNOVATIVE,

RELIABLE,

PATENTED

EXPLOSION PROTECTION

TECHNOLOGIES




Fike®

The Fike Expertise

Fike is the leader in delivering patented, innovative technologies to the explosion protection market. Effective management of dust and gas explosion risks requires an understanding of critical explosion characteristics. Determination and location of combustible atmospheres and potential ignition sources need to be identified. And explosion protection equipment must be properly designed and maintained to minimize catastrophic risks.

With over 65 years of field experience and a team of in-house engineers, application specialists and combustion researchers, Fike understands the complexities of plant processes, relevant code compliance and the critical nature of continued plant operation. The culmination of this expertise is Fike's complete line of explosion protection products – technology designed to help you achieve your safety goals AND keep you in compliance with the quickly changing codes, standards and regulations associated with the explosion protection industry.

Fike's Explosion Protection Technology

- EXPLOSION VENTING
- FLAMELESS VENTING
- EXPLOSION ISOLATION
- EXPLOSION SUPPRESSION
- TESTING SERVICES
- ENGINEERING EXPERTISE

Many industries in which combustible dusts or gases are handled risk the devastating effects of an explosion. The amount of heat liberated during an explosion creates extremely high pressures which can result in damaged process equipment, loss of production and serious injury to personnel. Leading insurance firms estimate the average direct costs of an explosion in the hundreds of thousands of dollars, with many unprotected explosions leveling plants, or even closing businesses.

Fike®

EXPLOSION PROTECTION INTEGRATED COMPONENTS

Hazard Analysis Testing and Support

Every application, process and facility is unique and requires a complete assessment to determine what needs to be protected and the most effective means for accomplishing the safety goals. Fike offers a wide range of both standard and non-standard explosibility tests designed to assist companies in identifying and mitigating costly explosion hazards — all completed at Fike's own state-of-the-art testing laboratories.

The first step in hazard analysis is to effectively determine the combustible or explosive nature of the material. Fike provides testing in both small and large vessels, designed and constructed to provide accurate data that is scalable to industrial equipment.

- Explosiblity parameters of P_{max} and K_{max}
- Explosibility limits of fuel, oxidant or ignition energy
- Performance at elevated temperatures and/or pressures to simulate customer operating conditions
- Large scale verification of mitigation technologies and designs.

Once characterized, the hazard can be managed through clear determination of the prevention and protection objectives, followed by selection and implementation of the appropriate technology. Fike's explosion protection includes venting, flameless venting, isolation and suppression … either separately or in combination.

Staffed with highly trained technicians, engineers, and combustion scientists, Fike testing is conducted in accordance with ASTM and CEN standards.

Fike is capabable of performing application and equipment tests, specifically designed for your unique industrial environment. From the development and completion of a test plan to full scale testing and design of the appropriate safety systems, you have the Fike experts working for you.

EXPLOSION PROTECTION INTEGRATED COMPONENTS

Mitigation Decision Chart

There are numerous ways to mitigate the risks of explosions. Effective management of explosion risks requires an understanding of dust, gas and/or vapor characteristics, the nature of processes and operations, the potential for business interruptions, facility limitations, existing codes and standards and economic concerns.

From testing and compliance expertise to the complete line of explosion protection solutions, Fike can help you choose the correct technology for your facility ... and your budget.

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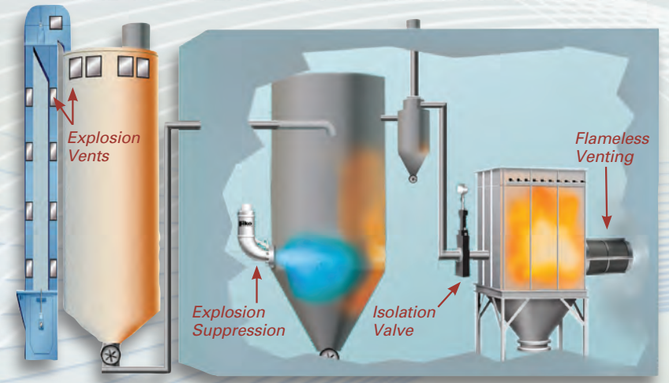
FIKE TOTAL EXPLOSION PROTECTION SOLUTIONS

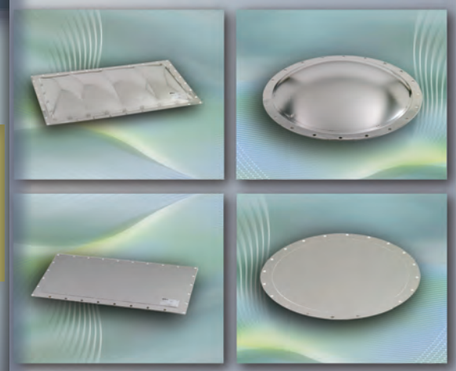


EXPLOSION VENTING

Relieves pressure during an explosion to prevent catastrophic damage to the process equipment.

Used when the enclosure cannot withstand maximum explosion pressure and when it is safe to release process materials and flames into the atmosphere.

Care should be taken to ensure that the process equipment is vented to safe areas to prevent secondary explosions.



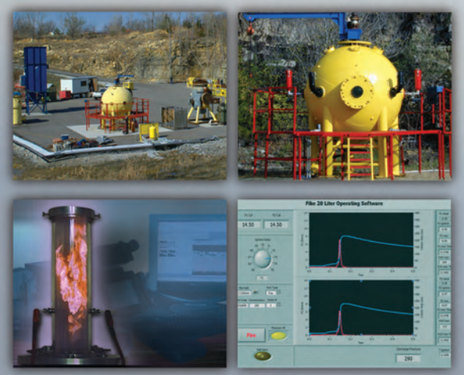
FLAMELESS VENTING

Used when the protected enclosure is indoors, where ducting is cost prohibitive or impossible, and/or when free-venting exposes personnel or other equipment to the dangers of a vented discharge.

EXPLOSIBILITY TESTING

Defines the explosibility parameters and limits of the material for explosion protection system design.

The results of the explosibility testing are required by Fike certified representatives to determine and design the appropriate level of protection.



EXPLOSION SUPPRESSION

Quickly introduces a suppressant agent into the vessel (within milliseconds) to mitigate the combustion hazard before pressure reaches dangerous levels.

Used when the process materials cannot be safely released to the atmosphere, when the installation of vents is impractical or when venting exposes personnel to dangerous pressure and flame discharge.

EXPLOSION ISOLATION

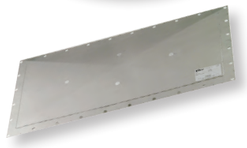
Stops the deflagration from reaching other areas through interconnected process ducts or pipes.

Isolation is employed to compliment both venting and suppression explosion protection methods. A deflagration should always be prevented from propagating to other parts of the facility.

Explosion Venting

Proven to be one of the most effective forms of passive explosion protection, explosion venting provides overpressure protection from potential deflagration hazards by providing a planned pathway for the expanding gases to escape, without damaging the vessel.

Fike has a wide range of virtually maintenance-free, reliable explosion vents. Economically priced and offering a long service life, Fike explosion vents are an ideal solution for many applications.



Fike is a leader in the development of effective, cost-efficient, ATEX- certified explosion venting solutions.

				PERFORMANCE ATTRIBUTES						
		MODEL	DESIGN	BURST PRESSURE	Operating Ratio	Operating Temperature	Vacuum Rating	Non-Fragmenting	Pulsating / Cycle	Sanitary	COMPLIANCE
SQUARE / RECTANGLE	BULGED	Vmax™	Single element	0.5 - 5.0 PSIG 103 - 345 MBARG 0.1 - 0.35 KG/CM²	80%	0 - 350°F -17 - 175°C	⌂⌂	•	•••		NFPA 68
		Sani-VS	Single element Integrated frame	0.3 - 10.2 PSIG 21 - 703 MBARG 0.02 - 0.7 KG/CM²	80%	-40 - 460°F -40 - 240°C	⌂⌂	•	•••	•	NFPA 68 ATEX / CE
		Sani-VSA	Single element Integrated frame	0.3 - 10.2 PSIG 21 - 703 MBARG 0.02 - 0.7 KG/CM²	80%	-40 - 230°F -40 - 110°C	⌂⌂	•	•••	•	NFPA 68 ATEX / CE 3-A
		CV-SI	Composite	0.7 -7.3 PSIG 50 - 500 MBARG 0.05 - 0.5 KG/CM²	70%	-40 - 842°F -40 - 450°C	⌂⌂⌂	•	•••o		NFPA 68 ATEX / CE
		CV-SI-HT	Composite	0.7 -7.3 PSIG 50 - 500 MBARG 0.05 - 0.5 KG/CM²	70%	-40 - 1112°F -40 - 600°C	⌂⌂⌂	•	•••o		NFPA 68 ATEX / CE
	FLAT	CV-CF	Composite	0.75 -10.0 PSIG 52 - 690 MBARG 0.05 - 0.7 KG/CM²	60 - 75%	-40 - 250°F -40 - 120°C	⌂⌂	•	•••		NFPA 68 ATEX / CE
		CV-SF	Composite	0.5 -10.0 PSIG 35 - 690 MBARG 0.04 - 0.7 KG/CM²	60 - 75%	-40 - 500°F -40 - 260°C	⌂⌂⌂	•	•oo		NFPA 68
		CV-H	Composite	0.5 -10.0 PSIG 35 - 690 MBARG 0.04 - 0.7 KG/CM²	60 - 75%	-40 - 500°F -40 - 260°C		•	•oo	•	NFPA 68
		CV	Composite	0.5 -10.0 PSIG 35 - 690 MBARG 0.04 - 0.7 KG/CM²	60 - 75%	-40 - 500°F -40 - 260°C	⌂⌂	•	•oo		NFPA 68 ATEX / CE
		CV-I	Composite	0.5 -10.0 PSIG 35 - 690 MBARG 0.04 - 0.7 KG/CM²	60 - 75%	-40 - 800°F -40 - 425°C	⌂⌂	•	•oo		NFPA 68
		Sani-V®	Single element Integrated frame	0.5 - 6.5 PSIG 35 - 448 MBARG 0.04 - 0.5 KG/CM²	50%	-40 - 460°F -40 - 240°C	⌂⌂	•	•oo	•	NFPA 68 ATEX / CE
		Sani-VA	Single element Integrated frame	0.5 - 6.5 PSIG 35 - 448 MBARG 0.04 - 0.5 KG/CM²	50%	-40 - 230°F -40 - 110°C	⌂⌂	•	•oo	•	NFPA 68 ATEX / CE 3-A
		EleGuard™	Single element Integrated frame	0.7 - 2.9 PSIG 50 - 200 MBARG 0.05 - 0.2 KG/CM²	25%	-4 - 140°F -20 - 60°C		•	•oo		NFPA 61 ATEX / CE
		Flex-V®	Composite Reclosing	1.23 - 1.81 PSIG 85 - 125 MBARG 0.09 - 0.127 KG/CM²	50%	-4 - 140°F -20 - 60°C	⌂⌂⌂	•	•oo		NFPA 68 ATEX / CE
ROUND	BULGED	CV-S	Composite	1.0 - 15.0 PSIG 69 - 1030 MBARG 0.07 - 1.0 KG/CM²	80 - 90%	-40 - 500°F -40 - 260°C	⌂⌂⌂	•*	•••		NFPA 68 ATEX / CE
		CV-SI	Composite	1.0 - 14.9 PSIG 70 - 1030 MBARG 0.07 - 1.1 KG/CM²	80%	-40 - 842°F -40 - 450°C	⌂⌂⌂	•	•••o		NFPA 68 ATEX / CE
		CV-SI-HT	Composite	1.0 - 14.9 PSIG 70 - 1030 MBARG 0.07 - 1.1 KG/CM²	80%	-40 - 1112°F -40 - 600°C	⌂⌂⌂	•	•••o		NFPA 68 ATEX / CE
	FLAT	CV-CF	Composite	.75 - 15.0 PSIG 52 - 1030 MBARG 0.05 - 1.0 KG/CM²	60 - 75%	-40 - 250°F -40 - 120°C	⌂⌂	•*	•••		NFPA 68 ATEX / CE
		CV-H	Composite	0.5 - 15.0 PSIG 35 - 1030 MBARG 0.04 - 1.0 KG/CM²	60 - 75%	-40 - 500°F -40 - 260°C		•	•oo		NFPA 68
		CV	Composite	0.5 - 15.0 PSIG 35 - 1030 MBARG 0.04 - 1.0 KG/CM²	60 - 75%	-40 - 500°F -40 - 260°C	⌂⌂	•*	•oo	•	NFPA 68 ATEX / CE
		CV-I	Composite	0.5 - 15.0 PSIG 35 - 1030 MBARG 0.04 - 1.0 KG/CM²	60 - 75%	-40 - 800°F -40 - 425°C	⌂⌂	•	•oo		NFPA 68

Vacuum Rating: ⌂⌂ *Partial* ⌂⌂⌂ *Full* **Pulsating / Cycle:** •oo *Good* •oo *Better* ••• *Best*

** Larger diameters may require the optional High Integrity model to prevent fragmentation. Please consult factory.*

EXPLOSION PROTECTION INTEGRATED COMPONENTS

Flameless Venting

During normal venting, an explosion is freely discharged, allowing flames, dust and combustion by-products to exit the protected process vessel. When the vessel is located indoors, ducts can be used to safely convey the explosion to the outside. However, ductwork can be logistically and/or financially prohibitive and will result in decreased venting efficiency. Flameless venting, in combination with Fike explosion vents, extinguishes the flame from the vented explosion without expensive ducting, limitations to equipment location, or more costly options.

Highly suited for indoor applications, flameless venting is designed to protect people and equipment from flames and dust, releasing only post-combustion gases.

Explosion Isolation

Burning material produced in the initial stages of a deflagration are conveyed through any open connections (ducts, piping, chutes, conveyors) putting connected equipment and facilities at risk to secondary explosions. These secondary explosions often cause the most devastation. Regardless of the protection measures considered, explosions must be prevented from propagating to other locations within the plant.

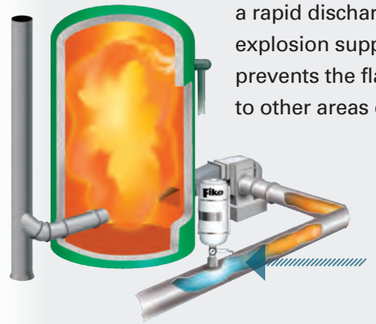
Fike's Explosion Isolation systems prevent the propagation of flame through the use of fast-acting valves and/or chemical barriers – effectively eliminating secondary explosions.

MECHANICAL EXPLOSION ISOLATION involves the use of mechanical valves to provide a physical barrier, preventing the spread of an explosion. Depending on the application and/or protected process, Fike has several options and sizes available:

EIV (Explosion Isolation Valve) *Designed to close within milliseconds of detecting an explosion, Fike's EIV prevents the spread of flames and pressure (in both directions), preventing an explosion from propagating. Fike EIVs are one of the fastest, most effective forms of explosion protection available.*

EIPV (Explosion Isolation Pinch Valve) *The EIPV consists of a heavy duty cast valve body containing a rugged elastomeric sleeve. Upon explosion detection, compressed air is released and within milliseconds the sleeve is "pinched" to full closure, stopping the explosion from spreading beyond the valve. Used in conjunction with other Fike explosion protection components, the EIPV is an economical way to prevent deflagration propagation.*

CHEMICAL EXPLOSION ISOLATION is achieved through a rapid discharge of a chemical explosion suppressant which prevents the flame from spreading to other areas of the process system.



An injection of a chemical extinguishing agent into the ductwork creates a barrier against flame propagation.

Explosion Suppression

Fike explosion suppression systems are designed to detect and chemically suppress an explosion in its earliest stages, before an explosion can cause damage to the equipment or escalate into a catastrophic event. While unsuppressed explosion pressures can reach dangerous levels in less than 50 milliseconds, Fike suppression technology can detect and respond in one millisecond, averting a potential disaster. And since explosion suppression systems do not release flame or other particulates, it is a natural choice when toxic materials are being handled, equipment is located indoors, or venting could expose personnel to dangerous pressure/flame discharge.

Fike is the leader in suppressing all classes of dust, gas and hybrid explosion hazards. Fike's innovative actuators release suppressant agents with remarkable speed and have a 10-year shelf life. Patented container and nozzle designs minimize flow restrictions, extinguishing the explosion faster and minimizing pressure build-up inside process equipment. The simple design of the suppression container has no moving parts or wear points, providing greater reliability over many years.

THE GCA ADVANTAGE

Offering the fastest, most reliable response time available, Fike explosion isolation and explosion suppression systems are activated with our exclusive Gas Cartridge Actuator, which can lower maintenance costs and plant downtime. The GCA has a 10-year service life compared to a 1-year found on competitor products.

A Fike explosion suppression system offers many distinct advantages:

- **Suppresses Class ST III dust explosion hazards - offering your business the highest level of industrial explosion protection.**
- **Patented dispersion nozzles provide full coverage and increase agent discharge velocity.**
- **The control circuit design provides continued service even if two of the wires become severed.**

Options are available for a variety of agents and sanitary applications.

EXPLOSION PROTECTION INTEGRATED COMPONENTS

Detection and Control

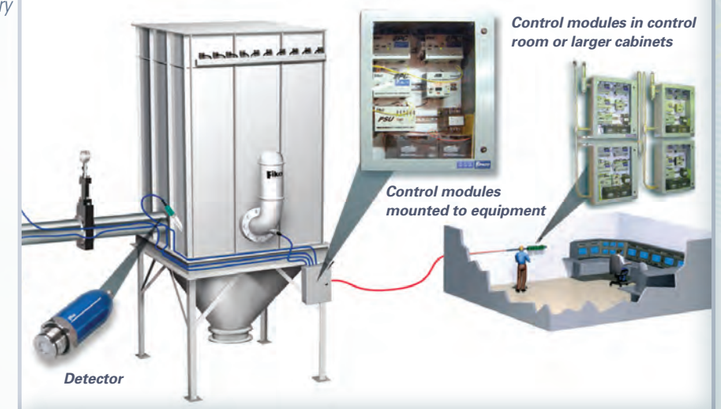
To be effective, the detection, evaluation/control, and activation of any explosion protection system must be completed within milliseconds. Fike detection and control interfaces with our explosion suppression and isolation systems to provide one of the fastest, most comprehensive explosion protection systems available.

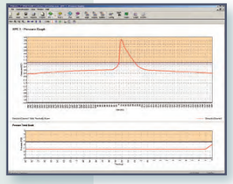
Though sophisticated, its modular design, small size, global compatibility and preconfigured setups make Fike detection and control both flexible and easy-to-use. Made up of five basic modules, it is easy to install and program. Let Fike help you select just one or a combination of modules, to create the explosion protection system that's right for your application.

- **Explosion Protection Controller (EPC):** *offers multiple hazard protection, activation pressure and status/event history*
- **Power Supply Unit (PSU):** *uninterruptible power supply for added safety and complete reliability*
- **Annunciator Module (AM):** *command/communication central with complete history retrieval function*
- **Relay Card (RC8):** *relays for process equipment interface, allowing the system to distinguish between critical and non-critical trouble conditions*
- **Ceramic Detector:** *detection that is virtually invulnerable to damage and false activation*

For decades, Fike has solved safety problems for industrial and business customers globally. Our experience, technological expertise and large-scale testing capability make us uniquely qualified to determine the appropriate protection for your processes. No matter how demanding the application, we can identify your risks and deliver the right protection solutions.

Fike explosion protection puts you in complete control





Fike detection and control also features EPWorks™, the most technologically advanced software available in explosion protection – providing you with system status, pressure readings and pre/post system activation history in easily understandable graphs.

Detection and control is a vital element in Fike's complete line of Explosion Protection Integrated Components.

For solutions that fit your process and your budget, choose Fike.

Fike®

TYPICAL EQUIPMENT APPLICATIONS

- Dust Collectors
- Precipitators
- Cyclones
- Hoppers
- Conveying Systems
- Bucket Elevators
- Blowers
- Pumps
- Pulverizers
- Grinders
- Dryers
- Oxidizers
- Polishers
- Screeners
- Mixers
- Silos
- Storage Bins/Tanks

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