ZOOK® PROOF®

SINCE 1952

EXPLOSION PROTECTION

Vent Panels

…provide over-pressure relief to minimize structural or mechanical damage caused by expanding gasses

NFPA 68 provides guidelines for the design, sizing, and application of explosion protection vents.

ZOOK Explosion Protection Vent Panels conform to NFPA 68 “Guide for Venting Dust Explosions” and VDI 3673 “Pressure Venting of Dust Explosions”.

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Explosion venting is the most common method of protecting personnel and equipment from the potential over-pressures generated by a dust or vapor ignition.

An explosion vent provides:

- A predetermined opening for flame and gasses to escape from the enclosure
- Limits the internal pressure of the enclosure
- Minimizes damage to the enclosure (Refer to TIME vs. PRESSURE curve)

ZOOK has manufactured quality Explosion Protection Vent Panels since 1978. In 1988 our first in-house laser was installed, making us the first Vent Panel Manufacturer with this valuable tool. Subsequently ZOOK added a second laser. This in-house laser capacity allows ZOOK to closely control 100% of the Vent Panel manufacturing process.

ZOOK's highly skilled craftsmen, equipped with state-of-the-art lasers, produce the highest quality, most reliable repeatable Explosion Protection Vent Panels available.

Vent: An opening in an enclosure to relieve the developing pressure from a deflagration.

Deflagration: Propagation of a combustion zone at a velocity that is less than the speed of sound in the unreacted medium.

Explosion: The bursting or rupturing of an enclosure or a container due to the development of internal pressure from a deflagration.

Maximum Pressure (P_{max}): Maximum pressure developed in a contained deflagration of an optimum mixture.

Reduced Pressure (P_{red}): Maximum pressure developed in a vented enclosure during a vented deflagration.

Static Activation Pressure (P_{stat}): Pressure that activates a vent closure when the pressure is increased slowly (with a rate of pressure rise less than 0.1 bar/min = 1.5 psi/min).

K_{st}: The deflagration index of a dust cloud.

Reference NFPA 68: *Guide for Venting of Deflagrations*

CV-F Series

Flat – single hinge – composite type

- Interchangeable with existing vent applications
- Square, Rectangular, and Round configurations
- Burst ratings from 0.50 to 8.00 psi
- Operating Ratios up to 60%
- 0% Manufacturing range is standard
- Manufactured to mount into standard angle frames
- Custom sizes and materials available upon request

Options

- Integral Burst Indication
- Gaskets

ZOOK Explosion Protection Vent Panels are tested at your specified temperature. **ZOOK** can accurately, efficiently, and economically destructively test and produce your order. Emergency service is available upon request. Contact ZOOK for details.

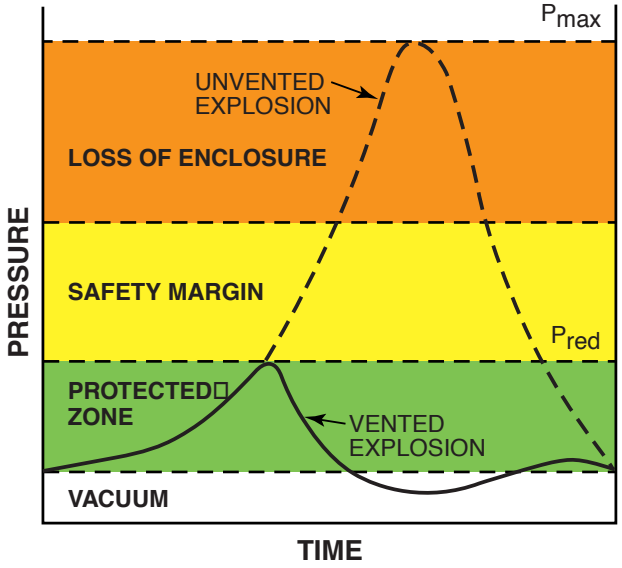
CV-P Series

Domed – single hinge – composite type

- Interchangeable with existing vent applications
- Better fatigue and cycle life when compared to flat single hinge designs
- Square, Rectangular, and Round configurations
- Burst ratings from 0.50 to 8.00 psi
- Operating Ratios up to 80%
- 0% Manufacturing range is standard
- Manufactured to mount into standard angle frames
- Custom sizes and materials available upon request

Options

- Integral Burst Indication
- Gaskets



Dusts and gasses, aluminum, benzene, chocolate, dyes, eggs (powdered), flour, grain, hydraulic fluid, ink toner, or other particulate (suspended in air) with a possible ignition source.

Ignition Sources

Spontaneous combustion, failure of a grounding system, tramp metal, bearing failure, fire, welding arc, and others.

Enclosures at Risk

Air separators, blenders, cyclones, dust collectors, elevators, flakers, grinders, hoppers, conveyors, dryers, vacuum receivers, and silos.

Note: *Explosion Protection Vent Panels will not prevent an explosion!*

CV-II-F Series

Flat – segmented – composite type

- Interchangeable with existing vent applications
- Superior fatigue and cycle life when compared to flat single hinge designs
- Square, Rectangular, and Round configurations
- Burst ratings from 0.50 to 8.00 psi
- Operating Ratios up to 60%
- 0% Manufacturing range is standard
- Manufactured to mount into standard angle frames
- Custom sizes and materials available upon request

Options

CV-II-P Series

Domed – segmented – composite type

- Interchangeable with existing vent applications
- Superior fatigue and cycle life when compared to domed single hinge designs
- Square, Rectangular, and Round configurations
- Burst ratings from 0.50 to 8.00 psi
- Operating Ratios up to 80%
- 0% Manufacturing range is standard
- Manufactured to mount into standard angle frames
- Custom sizes and materials available upon request

Options

- Gaskets

Options and Accessories:

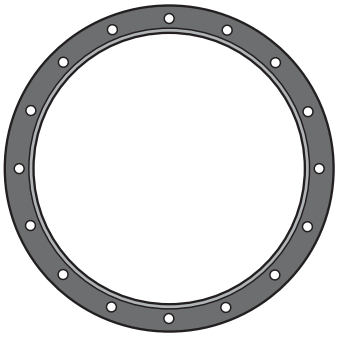
Burst Indication
(for CV-F Series)

All vent panels can be supplied with **ZOOK**'s integral burst indication **(BI)**

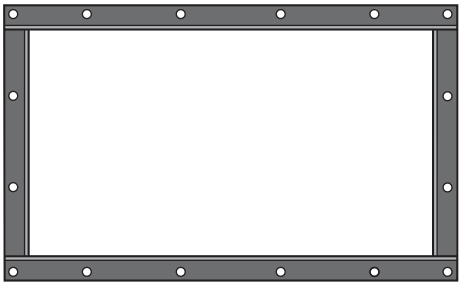
The **BI** offers instant indication of venting when connected to a DCS system. Intrinsically safe barriers should be used when the vent is installed in a potentially hazardous environment.

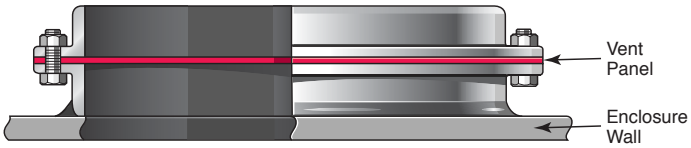
Frames

ZOOK vent frames are available for all size vents in standard materials of Carbon and Stainless Steel.



Vent framing is an important part of the performance of an explosion vent panel.





Welded Design

Bolted Design

Vent Panel Specifications

Configuration:

☐ Square/Rectangular ☐ Round ☐ Flat ☐ Domed

Dimensions:	**Frame I.D.**	**Frame O.D.**
Diameter	_____	_____
Length	_____	_____
Width	_____	_____
Bolt Hole: Size	_____	Qty _____

(A general arrangement drawing of the vent(s) being ordered will be submitted for approval prior to manufacturing.)

Materials: ☐ 316SS ☐ Other _____

Quantity each: _____

P_{stat} – Set relieving pressure of vent
[must be less than P_{red} by at least 0.05 bar (0.73 psi)]
_____ @ _____ ☐ °F ☐ °C

P_{max} – Max. allowable internal pressure
[must be less than P_{red} by at least 0.05 bar (0.73 psi)]
_____ @ _____ ☐ °F ☐ °C

P_{red} – Max. allowable pressure during venting
(should not exceed 2/3 of the pressure at which the weakest part of the vented enclosure will break)
_____ @ _____ ☐ °F ☐ °C

Operating Pressure: _____ ☐ Positive ☐ Negative

Is panel subjected to pressure fluctuations? _____ ☐ Positive
(If so, state magnitude) _____ ☐ Negative

Operating Temperature: _____ ☐ °F ☐ °C

K_{st} or Media contained in enclosure: _____

Hazard Dust Class: ST-1 ST-2 ST-3

Is the enclosure connected to any other equipment by means of a duct or piping? Y N

Is the enclosure filled or discharged via a duct which the explosion could originate? Y N

If discharge ductwork is used,state length.
(Vent ducts will significantly increase the pressure developed during venting and should be as short as possible. Vent ducts should only be used when absolutely essential.) _____

Enclosure Dimensions

Diameter _____
Length _____
Width _____
Height _____
Total Volume _____

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