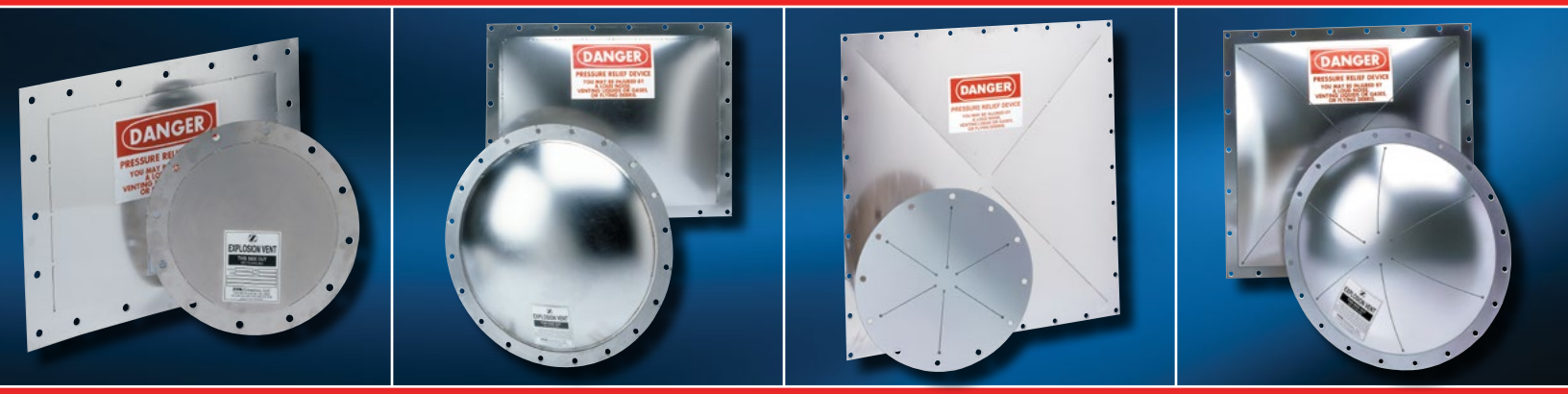
ZOOK®

# Explosion Protection Vent Panels




**Safety** through **knowledge** and **performance**.

# Explosion Protection
## Vent Panels

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

## Explosion Protection

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

An explosion vent provides:

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

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

## CV-F Series Features

- 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
- Insulation (thermal and vapor)
- Gaskets


## CV-P Series Features

- 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
- Insulation (thermal and vapor)
- Gaskets


**Hazardous Products**: 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!

# Explosion Protection
## Vent Panels

### CV-II-F Series Features

- 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

- Insulation (thermal and vapor)
- Gaskets


### CV-II-P Series Features

- 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

- Insulation (thermal and vapor)
- Gaskets


### Definitions

**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.

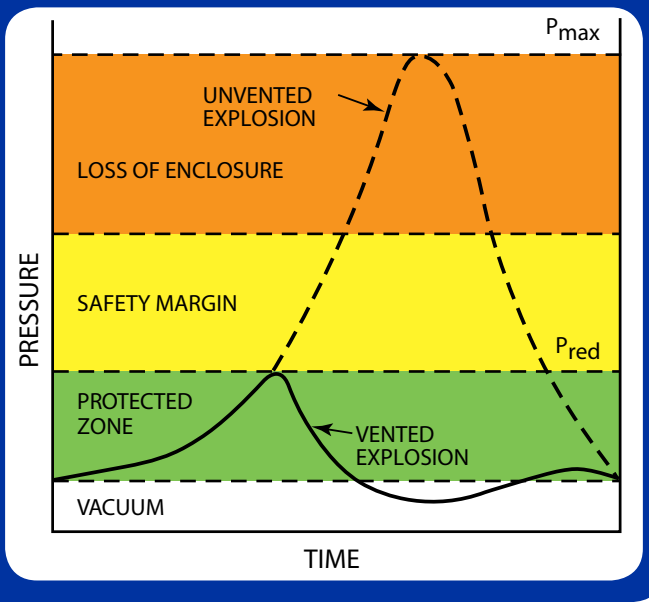
**Static Activation Pressure ($P_{stat}$):** Pressure that activates a vent closure when the pressure is increased slowly (with a rate of pressure rise less than 0.1 bar/min = 1.5 psi/min).

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

**Enclosure:** A confined or partially confined volume.

**Ultimate Strength:** The pressure that results in the failure of the weakest structural component of an enclosure.

### Time vs. Pressure



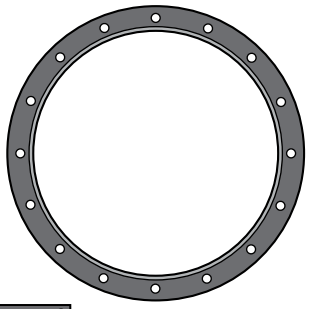
# Options and Accessories

## Burst Indication
(for CV-F and CV-P Series)

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

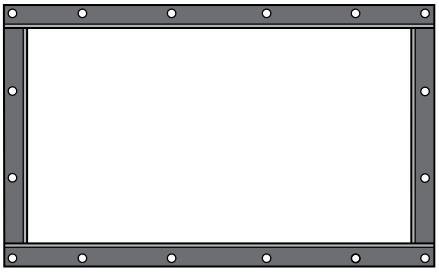
The BI offers instant indication of venting when connected to a DCS system. Intrinsically safe barriers should be used when the vent is installed in a potentially hazardous environment.

## Frames

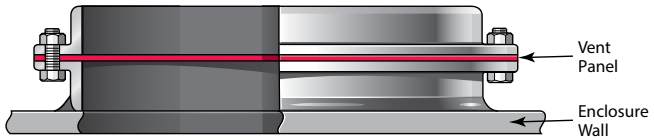


ZOOK vent frames are available for all size vents in standard materials of Carbon and Stainless Steel.

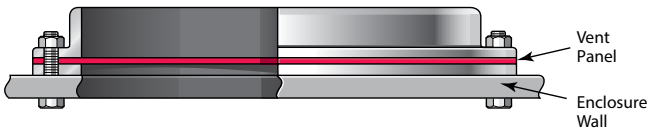
Vent framing is an important part of the performance of an explosion vent panel.



**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: _____

$P_{stat}$ – Static relieving pressure of vent
_____ @ _____ ❑ °F ❑ °C

Enclosure Ultimate Strength
_____ @ _____ ❑ °F ❑ °C

$P_{red}$ – Max. pressure during venting
_____ @ _____ ❑ °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 significanly 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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**Safety** through **knowledge** and **performance**.