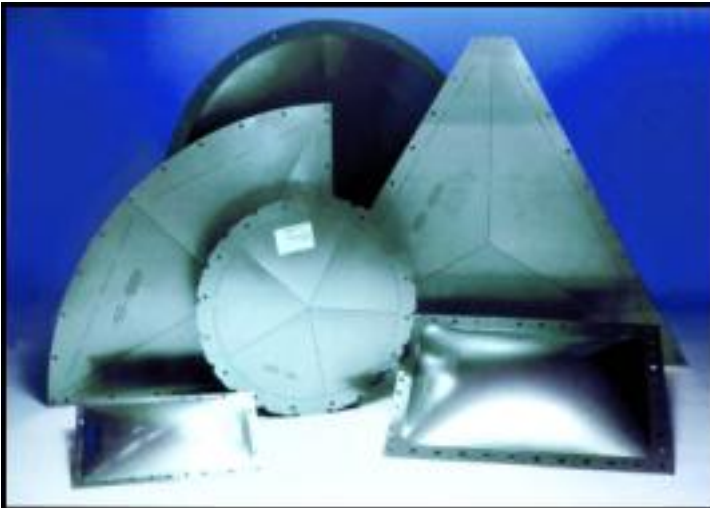


Bursting Panels







Panel Flo-Tel™

World-wide, a number of regulatory and best-practice groups have worked to improve the safety and reliability of explosion venting. These groups include NFPA, ISO and others. Elfab has adopted and deployed their design codes and complied with all relevant legislation for over 25 years to develop our product line. As a result, Elfab can combine expert knowledge of your application and manufacturing flexibility to produce a product that meets your requirements.

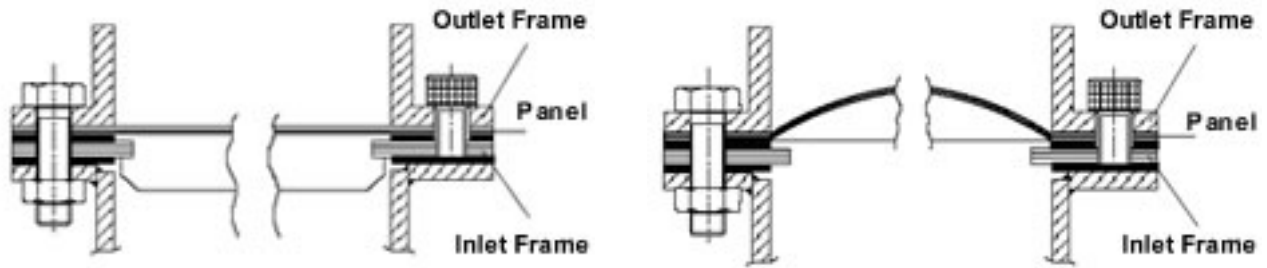
Explosions in gases, vapours or dusts are not explosions in the military sense, rather they are characterised by the rapid burning of the gas or dust, which is more properly termed a deflagration. The chemical products of combustion and its physical and thermal effects cause a rapid and potentially dangerous rise in pressure in a containing vessel.

Whilst it is obvious that inflammable gases and vapours constitute an explosion hazard, it is less well appreciated that the dusts of combustible solids can also give rise to explosions; this may occur with the dusts of metal, plastics, wood, coal, sugar, starch, flour and many other commonly used products.

Elfab is unique in having panels approved as a “Protective System”  II GD (when used with an Elfab approved frame), and also a detection device  II 1GD EEx ia IIC. EC-Type Examination Certificate ITS03 ATEX 11359, supplied integral to the panel, called Panel Flo-Tel™ which should be connected to an intrinsically safe circuit.

- ATEX Approved protective system  II GD
- ATEX Approved detection device  II 1GD EEx ia IIC
- EC-Type Examination Certificate ITS03 ATEX 11359
- Fail-safe
- Maintenance free
- Instant pressure relief - rapid full venting
- Non fragmenting design
- Vacuum and back pressure capability
- High temperature capability
- Corrosion resistance
- Dust tight seal
- Low installation costs

Specifications	
Size Range	0.08m ² to 2.4m ² (0.9ft ² to 25ft ²)
Set Pressure Range	0.05 bar g to 0.5 bar g (0.7 psig to 7 psig)
Temperature Range	-40 to 250C (-40 to 482F)
Fragmentation on Burst	Non-fragmenting design
Vacuum Service	Back pressure capable
Material Range	Stainless Steel as standard, others available
Designs	Rectangular, circular, trapezoidal

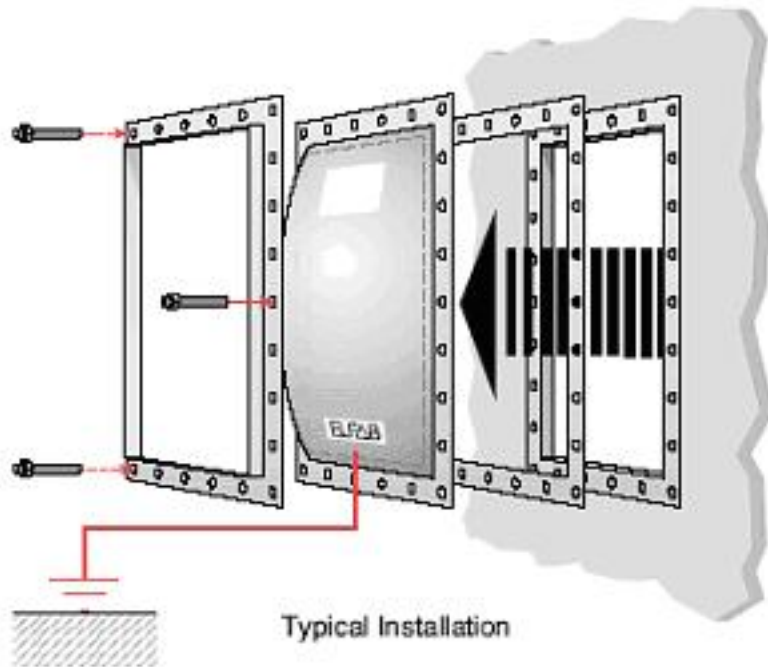
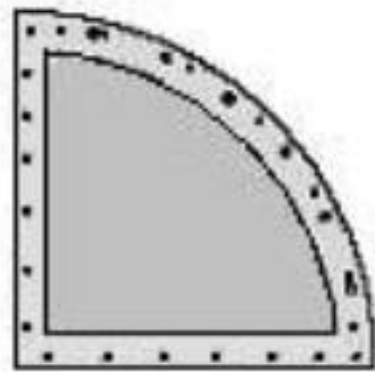
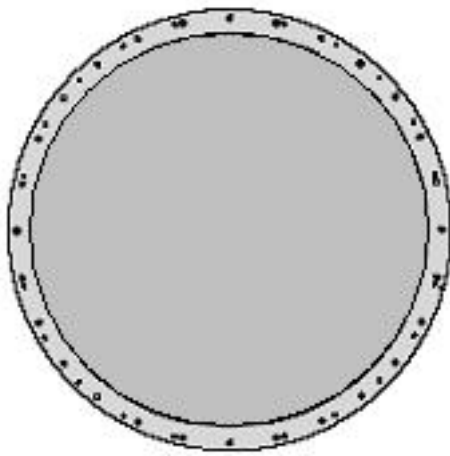
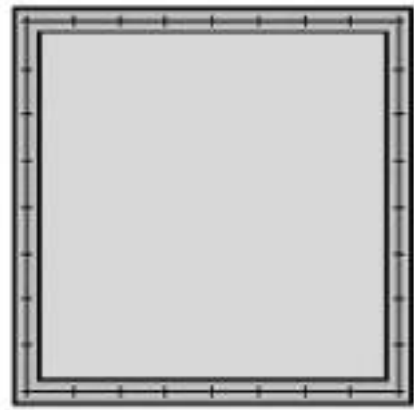
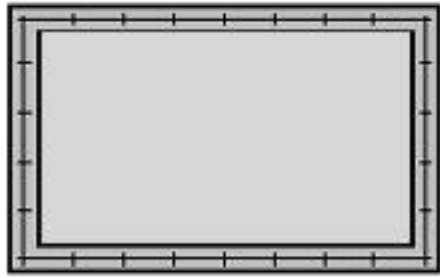


Flat panels offer an economic and efficient means of protecting plant from overpressure caused by an explosion.

Domed panels bring the additional benefit of enhanced operating performance under cyclic pressure, back pressure and vacuum conditions.

The issue of relief area required by the wide variety of applications is addressed by offering custom sizes in the following designs: square, rectangular, trapezoidal and circular vents sizes across an extensive range of sizes.

Elfab has unique 3D laser cutting and testing facilities that enable us to produce competitively priced, certified opening bursting panels in any configuration and in any bolt pattern.



Typical Installation

Standard Bursting Panel Sizes

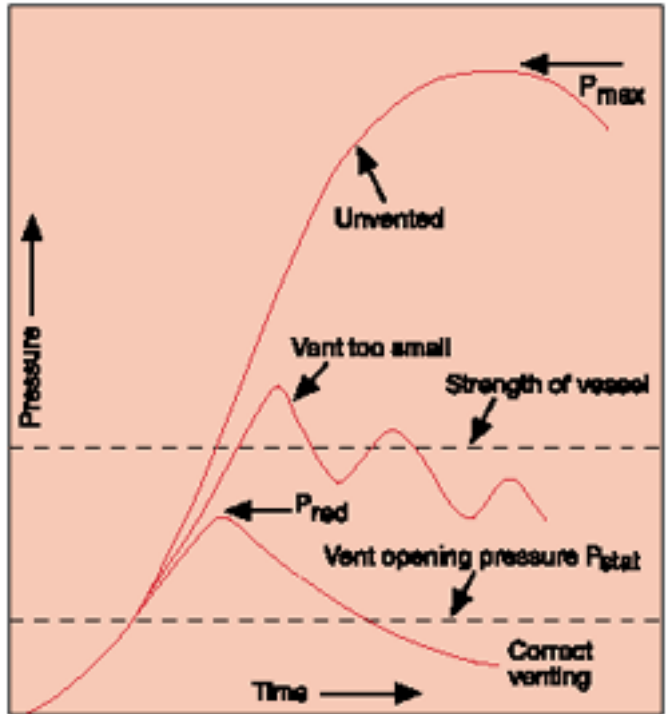
Type	External Dimensions mm (in)	Internal Dimensionsmm (in)	Vent Area m ² (ft ²)	Product Code
Rectangular	1850 x 1500 (72.8 x 59.0)	1770 x 1420 (69.7 x 55.9)	2.48 (25.4)	XSF2400
Rectangular	1850 x 1220 (72.8 x 48.0)	1770 x 1140 (69.7 x 44.9)	1.99 (20.8)	XSF1970
Rectangular	1220 x 1220 (48.0 x 48.0)	1140 x 1140 (44.9 x 44.9)	1.27 (13.4)	XSF1270
Rectangular	1100 x 1100 (43.3 x 43.3)	1020 x 1020 (40.2 x 40.2)	1.00 (10.6)	XSF1000
Rectangular	1100 x 1000 (43.3 x 39.4)	1020 x 920 (40.2 x 36.2)	0.92 (9.7)	XSF920
Rectangular	1000 x 1000 (39.4 x 39.4)	920 x 920 (36.2 x 36.2)	0.83 (8.8)	XSF830
Rectangular	1220 x 735 (48.0 x 28.9)	1140 x 655 (44.9 x 25.8)	0.72 (7.6)	XSF720*
Rectangular	980 x 870 (38.6 x 34.3)	890 x 780 (35.0 x 30.7)	0.68 (7.2)	XSF680
Rectangular	850 x 850 (33.5 x 33.5)	770 x 770 (30.3 x 30.3)	0.58 (6.1)	XSF580
Rectangular	1000 x 666 (39.4 x 26.2)	920 x 586 (36.2 x 23.1)	0.52 (5.3)	XSF524
Rectangular	750 x 750 (29.5 x 29.5)	670 x 670 (26.4 x 26.4)	0.44 (4.6)	XSF440
Rectangular	735 x 735 (28.9 x 28.9)	655 x 655 (25.4 x 25.4)	0.41 (4.3)	XSF410*
Rectangular	690 x 590 (27.2 x 23.2)	610 x 510 (24.0 x 20.0)	0.30 (3.2)	XSF300
Rectangular	735 x 455 (28.9 x 17.9)	655 x 375 (25.8 x 14.8)	0.23 (2.4)	XSF230*
Rectangular	455 x 455 (17.9 x 17.9)	395 x 395 (15.6 x 15.6)	0.14 (1.5)	XSF140*
Rectangular	455 x 300 (17.9 x 11.8)	395 x 240 (15.6 x 9.4)	0.08 (0.9)	XSF080
Round	1220 (48.0)	1100 (43.3)	0.93 (9.8)	XRF933
Round	1159 (45.6)	1000 (39.4)	0.77 (8.1)	XRF770
Round	1044 (41.1)	900 (35.4)	0.62 (6.5)	XRF620
Round	937 (36.9)	800 (31.5)	0.49 (5.2)	XRF490
Round	828 (32.6)	700 (27.6)	0.37 (3.9)	XRF370
Round	710 (27.9)	600 (23.6)	0.27 (2.9)	XRF273
Round	603 (23.7)	500 (19.7)	0.19 (2.0)	XRF190
Round	447 (17.6)	350 (13.8)	0.09 (0.98)	XRF090

Domed panels can also be produced in the above sizes, ask your representative for details

Support Frames and Gaskets

Steel, stove enamelled frames are available for installation of all panels. The frames have built-in support bars to prevent panel implosion. Support bar configurations can be designed to suit specific vacuum and back pressure requirements.

Vent Sizing	Over the years, many methods have been adopted for sizing vents. At Elfab we are able to calculate sizes using any of the recognised methods. Our standard method is to use “Win-Vent” sizing software.
H and D	Height and diameter of vessel (or equivalent)
Kst	Maximum rate of pressure rise of media (dp/dt) as determined from tests in 1m ³ vessel
Pred	Maximum pressure permitted in the event of an explosion.
Pstat	is also required for sizing, being the set pressure of the panel. Elfab can provide this information.
Pmax	Maximum pressure reached during an explosion in a closed vessel, based on 1m ³ vessel tests (is only required if using Scholl equation stated in VDI 3673)




Under severely turbulent conditions, an explosion may be much more violent than conditions assumed in the above methods. These circumstances need to be identified, as larger vent areas are required.

Explosions, when they occur, should be vented direct to atmosphere. The **discharge must be to a safe place** and may require a duct. The length and configuration of duct may significantly affect the relief and must be taken into account when calculating vent area.

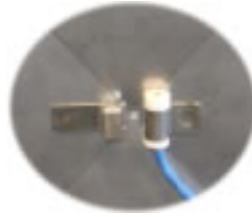
Elfab are able to offer advice on the application and sizing of explosion vents, based upon many years of experience and involvement in the latest developments in this field.

Flo-Tel™ Detection

Elfab is unique in supplying a burst panel detection, ATEX approved to category  II 1GD EEx ia IIC. EC-Type Examination Certificate ITS03 ATEX 11359, as standard with its panels. (Must be connected to an intrinsically safe circuit)

ELECTRICAL INFORMATION

Panel Flo-Tel™ should be connected to an Intrinsically safe supply that is compatible with values:
 $U_i = 30v$.
 $I_i = 100mA$.
 $P_i = 0.75W$.
Supplied with a 2m cable.



TEMPERATURE LIMITS

-100°C to 200°C

Pressure Intelligence

The data shown on these sheets represents the standard offering from Elfab. Depending upon the requirements of your application, Elfab maybe able to provide a solution based on this product but outside the standard operating parameters. In addition, Elfab produces an extensive range of alternative products which maybe more suitable for your requirements.

As a result of extensive testing, Elfab can advise on these choices, or on other technical matters, such as discharge requirements, temperature testing, material selection and corrosion resistance, customised designs and burst detection.

To discuss your specific product or service requirements please contact your Elfab representative.



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