# Deflagration Venting

Successful venting of an enclosure during deflagration is essential to the safety of all concerned. Providing adequate vent area is one of the most important factors to be considered when sizing the vent area of an enclosure.

The NFPA (National Fire Protection Association) has provided standards and proper sizing equations for relief areas for enclosures. OSECO's SizeRite sizing software, takes into consideration all necessary variables when sizing a rupture panel for your applications.

The following definitions should be noted and taken into consideration when the venting of an enclosure is being considered.

DEFLAGRATION: A FLAME FRONT PROPAGATING THROUGH UNBURNED MEDIA LESS THAN THE SPEED OF SOUND (SUBSONIC VELOCITY).

DETONATION: FLAME FRONT PROPAGATING THROUGH UNBURNED MEDIA GREATER THAN THE SPEED OF SOUND (SONIC VELOCITY).

EXPLOSION: A POINT AFTER DETONATION OCCURS WHERE THE INTERNAL PRESSURE EXCEEDS THE ULTIMATE STRENGTH OF THE ENCLOSURE.

PMAX: THE MAXIMUM INTERNAL PRESSURE WHICH THE ENCLOSURE CAN SUSTAIN.

PRED: THE MAXIMUM ALLOWABLE INTERNAL PRESSURE THE ENCLOSURE WILL EXPERIENCE DURING A VENTED DEFLAGRATION.

PSTAT; THE DESIGNED PRESSURE THAT THE RUPTURE PANEL OPENS AND VENTING BEGINS.

RUPTURE PANEL: A PRESSURE AND TEMPERATURE SENSITIVE MEMBRRANE DESIGNED TO RUPTURE AT A PREDETERMINED PRESSURE AND TEMPERATURE. ALSO-KNOWN-AS, EXPLOSION VENTS OR VENT PANELS.

*"Deflagration venting is one means of controlling damage. By releasing expanding gases through an opening engineered for that purpose, it is possible to maintain a reduced maximum pressure (Pred) that is below that which would cause unacceptable damage." NFPA 68, Sec. 2-2.6.*

*"The choice of the most effective and reliable means for explosion control should be based on an evaluation that includes the specific hazard and objectives for protection." NFPA 68 Sec1-1.2*

Many of the applications for rupture panels and the venting of enclosures occur in the processing of grain and the associated dust. Grain dust is a highly explosive media and a natural occurrence in the pneumatic handling and conveying of grain.

Guidelines for Starch, Grain Elevators, Feed Mills, and Agricultural Commodities have now been consolidated in the NFPA 61 Bulletin , Standards for the Prevention of Fires and Dust Explosions in Agricultural and Food Products Facilities.

Rupture Panels

OSECO manufactures rupture panels in square, rectangular and round shapes. These panels may be flat, crowned and/or insulated, depending on type, style and size.

**Factors that should be considered when selecting a rupture panel:**

- material of construction required
- media being ventilated
- normal operating temperature
- maximum temperature
- nominal working pressure
- rupture pressure required (Pstat)
- location of the vent (interior or exterior)
- new or retrofit application
- static or cycling application
- vacuum condition
- vent area required

The advantages of using rupture panels over other methods of venting are economical cost and a leak-tight seal. OSECO rupture panels are dependable and efficient. The composite construction provides strength for static and high vacuum applications. OSECO's use of laser scoring technology provides exactness, dependability and repeatability in establishing set rupture pressures.

The finished product is a pressure sensitive rupture panel that is accurate, dependable and provides rapid response venting in the event of deflagration.

**Features and options of the OSECO rupture panel product include:**

- leak tight seal
- standard & special sizes
- minimal or zero fragmentation
- flat or crowned design
- broad range or material available
- welded or bolted frames
- square, rectangle or round shapes available
- insulated panels for elevated temperatures
- rapid opening
- maximum vent area
- cycling or static service
- test certifications
- emergency service
- total in-house manufacturing capabilities

Dust Collectors & Arrestors, Buck & Drag Conveyors, Blenders, Mixers, Crushers, Grinders, Pulverisers, Driers, Ovens & Furnaces, Ducts, Bins, Silos, Grain Elevators or Any Application where deflagrations are possible!