

# Emergency Relief Vent

## Emergency Relief Vent for low pressure storage tanks

The Elmac Technologies non-sparking emergency relief vents provide emergency venting capacity in the event of fire, they can also permit access to low pressure storage tanks for inspection and maintenance. They are used extensively on bulk storage tanks and digesters.



### Principle of operation

Emergency relief vents are fitted to storage tanks to allow emergency flow due to the excessive venting requirement from a fire burning around a storage tank. This eliminates a costly tank rupture, providing emergency venting from abnormal internal pressure beyond the capability of the pressure relief vent. In the event of a fire, the pallet will lift at a pre-determined pressure, thus supplying a large venting area.

Vents employ a PTFE insert, affording a tight seal below set pressure between the pallet and the corrosion resistant seat. An alternative model is available, fitted with an additional spring-loaded vacuum valve that will open under negative pressure to protect the tank from any vacuum condition damage that may occur.

### Benefits

Hinged pallet can be manually lifted allowing access to the tank for cleaning and inspection

Range of sizes and materials to suit diverse applications

Wide range of pressure settings to provide maximum tank protection whilst ensuring minimum gas loss

Low cost maintenance

### Materials and options

Model	Emergency Relief Vent
Sizes (Nominal Bore)	10" 12" 16" 18" 20" 24"
Process Connection	1. API650 (20" & 24") 2. ANSI 150# 3. Special (on request)
Materials	1. Aluminium 2. Carbon Steel 3. Stainless Steel 4. Special (on request)
Diaphragm and Insert	PTFE
Weight	1. Lead Plate (Standard) 2. Stainless Plate
Pressure Settings	3"wc (7.5mbar) – 36.2"wc (90mbar)
Vacuum Settings	3.46"wc (9mbar) – 10"wc (25mbar)

## Regulatory requirements

In the United Kingdom, the Health & Safety Executive Guidance Note, "The Storage of Flammable Liquid in Tanks" (HSG176) covers the storage of liquids with a flash point of 55°C or below. These regulations include:

Petroleum spirit

Kerosene

Aviation fuels

Most solvents

Because of the higher flashpoint gas oil, medium and heavy fuel oils are excluded from this requirement. The European tank standard BSEN 14015:2004 states (10.6.2) that emergency pressure relief shall be provided unless the purchaser specifically excludes same in Annex A.

## Fire engulfment

HSG176 requires emergency relief venting to be provided on storage tanks containing liquids with a flash point below 55°C to cope with possible fire engulfment. The aim is to relieve the internal pressure of the tank from rapid product vapour build-up and avoid rupture of the shell or base, so that the liquid retaining integrity is preserved.

## Relief vents

The amount of emergency relief venting to be provided should be calculated as per BSEN 14015:2004 Annex L or API 2000. Emergency relief-venting can be provided by a weak shell to roof joint (frangible roof) which is designed to fail before the shell to base joint. Design constraints mean that most tanks less than 15 metres in diameter cannot be considered as having frangible roofs. In such cases, tanks must be provided with emergency relief-venting manways on the roof, designed to lift the hinged cover before the tank maximum design pressure is exceeded. For existing tanks, emergency relief vents can often be fitted to the existing roof manway to enable tank access.

## Operation

The operational tank venting system or pressure/vacuum relief valves handle normal tank venting due to product import/export and ambient temperature variations. In the event of fire engulfment, as the vapour pressure in the tank increases to a point where normal venting equipment capacity is exceeded, the hinged cover will lift, relieving the pressure and protecting the tank from rupture.



The pressure build-up will be quite slow, therefore the cover should not open violently and cause any damage to the tank. Emitted vapours may well be ignited by the fire, but should 'flame-off' externally until brought under control by fire fighting operations. Emergency relief vents will not normally afford protection against internal tank vapour explosions from static discharges etc, due to the fact that the pressure build-up will be very rapid and exceed the capacity of the device. In this instance, the cover will snap open violently and may well cause damage to the tank, it is however likely that there will be more significant damage elsewhere on the fabric of the tank from the internal explosion.

## Elmac expertise

Elmac has been manufacturing protection equipment since 1948, and bring enhanced levels of flame and explosion protection to a diverse range of applications. Elmac offers considerable technical leadership, and using test facilities, along with CFD capabilities, employs research teams renowned for developing solutions for the most challenging of industrial applications.

## Customer Support

Tel: +44 (0) 1352 717600

Email: [sales@elmactech.com](mailto:sales@elmactech.com)

Fax: +44 (0) 1352 717642

Greenfield, Flintshire, United Kingdom CH8 9DP

All specifications are correct at time of print, are for guidance purposes only and subject to change without prior notice.

Issue No. 04 (02/17)



[www.elmactechnologies.com](http://www.elmactechnologies.com)