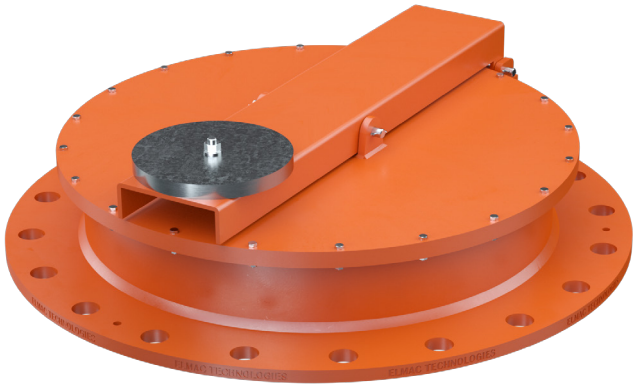
# Emergency Relief Vent

## For Low Pressure Storage Tanks

Elmac Technologies

Protecting People, Property and our Planet.



The Elmac Technologies® non-sparking Emergency Relief Vents (ERV's) provide high venting capacity. They can be used for pressure relief in an emergency case such as tanks subject to fire exposure. They are used extensively on bulk storage tanks and digesters. They can also permit access to low pressure storage tanks for inspection and maintenance

## 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 an external fire, the vent will open at a pre-determined pressure, thus creating a large venting area.

A PTFE insert is provided to achieve leak tight sealing between the vent and seat under normal operating conditions. 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 damage that may occur under vacuum conditions.

## Materials and Options

| Model | Emergency Relief Vent |
|---|---|
| Sizes (DN) | 10", 12", 16", 18", 20" & 24" |
| Process Connection | API650 (20" & 24")<br>ANSI 150#<br>Special (on request) |
| Materials | Aluminium<br>Carbon Steel<br>Stainless Steel<br>Special (on request) |
| Diaphragm and Insert | PTFE |
| Weight | Lead Plate (Standard)<br>Stainless Plate |
| Pressure Settings | 3"wc (7.5mbar) – 48"wc (120mbar) |
| Vacuum Settings | 3.46"wc (9mbar) – 10"wc (25mbar) |

## Features and Benefits

- Hinged vent 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 product vapour loss
- Low cost maintenance

## Regulatory Requirements

In the United Kingdom, the Health & Safety Executive Guidance, "The Storage of Flammable Liquids in Tanks" (HSG176) covers the storage of liquids with a flash point of 60°C or below. These regulations include:

- Petroleum spirit
- Aviation fuels
- Kerosene
- Most solvents

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

## Fire Engulfment

HSG176 requires emergency relief venting to be provided on storage tanks 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 BS EN 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 open 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 open 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 Technologies® has been manufacturing protection equipment since 1948 and brings enhanced levels of flame and explosion protection to a diverse range of applications.

Elmac offers considerable technical leadership and, using test facilities along with Computational Fluid Dynamics (CFD) capabilities, employs research teams renowned for developing solutions for the most challenging of industrial applications.

## Customer Support

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