

Pressure Relief Systems

Containment systems, such as process vessels, which are or may become pressurised, can become a serious hazard if the internal pressure increases to the point at which the Maximum Allowable Working Pressure (MAWP) of the vessel is exceeded. Systems involving pressurised gases are a particular risk because of the large amount of energy which is stored in the compressed gas. The rupture of vessels, particularly those containing pressurised gases, due to over-pressurisation, can result in serious injury or death of personnel and damage to equipment in the surrounding area.

The installation of appropriately designed relief systems is required by both pressure vessel design codes and the UK Pressure Systems Regulations. The design of relief systems requires consideration of the operation of the equipment item and the system and the identification of the impact of a number of potential contingencies which may cause an over-pressure situation. The contingencies which are normally considered include fire, operator error, equipment and instrument failures, utility failures (such as cooling medium, power, instrument air and inert gas), internal explosions, runaway reactions, and feedstock/product contamination. Rowan **House** ^{Ltd} has extensive experience of the design of relief systems and is available to assist operators to ensure that appropriate relief systems are correctly designed and installed in order to satisfy regulations and provide the required levels of protection. Where the discharge through the relief device is a mixture of liquids and vapours, Rowan **House** ^{Ltd} is able to provide guidance using the DIERS Technology developed by AIChE.

The relief devices used include relief valves, bursting discs and liquid seals. Liquid seals are used for low pressure applications and Rowan **House** ^{Ltd} has recently developed a system called **LP-Reliefclean** which provides a reliable liquid seal system which can incorporate the option of the mitigation of emissions where the gas or vapour being relieved is either hazardous or environmentally undesirable (such as because of its odour). Rowan **House** ^{Ltd} is available to assist you to select the appropriate devices for your applications.

If you are involved in processing flammable powders or dusts inside vessels or tanks, it is very difficult to ensure that explosive conditions never arise inside the vessel. It is normally necessary to fit appropriate explosion venting facilities to prevent vessel damage due to internal explosions. Rowan **House** ^{Ltd} has extensive experience of the design of such explosion venting facilities and also of investigating explosions when such systems have not been correctly designed. Many common powders and dusts are flammable and the explosive potential of such dusts are often not fully appreciated.

Adequate handling and treatment of the discharges from relief systems is often required and the UK Environment Agency will normally require them to be considered. The Rowan **House** ^{Ltd} **LP-Reliefclean** system is available to help mitigate emissions and other equipment is available including knock-out vessels, scrubbers and flares. Rowan **House** ^{Ltd} has extensive experience of relief disposal system design and can assist you with optimum system selection. Rowan **House** ^{Ltd} can also assist with studies on **Atmospheric Emissions** and **Atmospheric Dispersion** (see separate sheets on these subjects).

Hence for all your pressure relief system applications, contact :

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