



Leaflet 11

SAFETY CHECKS FOR CRYOGENIC TANKS

Users of vacuum insulated cryogenic and conventionally insulated refrigerated liquid tanks have a duty of care to ensure the equipment is operated safely on their site. Equipment and gas suppliers can be consulted for relevant safety and operational information.

Whilst gas suppliers carry out pre and post-fill checks when making deliveries, the user has a duty to carry out routine safety inspections as detailed in the operating instructions. This leaflet provides some simple daily safety checks to compliment those recommended in typical operating instructions. Further information on the additional duties of users' is available in BCGA Leaflet 12, *Liquid gas storage tanks. Your responsibilities.*

If during the following checks any adverse or abnormal conditions are seen, or there is doubt about the safety of the tank, it is to be reported to the user's management, as well as the tank owner and gas supplier. Your gas supplier may be able to provide further technical and safety information.

Safety may be compromised if such checks are not routinely performed leading to potential equipment failure and possible personal harm. Attention is drawn to the HSE Safety Alert "*Restricted pipe movement within perlite vacuum insulated static cryogenic tanks of a capacity above 1 000 litres.*"

<https://www.hse.gov.uk/chemicals/cryogenicalert.htm>



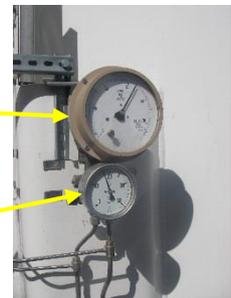
Tank pressure and contents indication

Check readings to ensure that the tank pressure and liquid levels are within safe limits.

Immediately report any deviation from these safe limits. Overpressure is generally the single biggest hazard associated with gas storage systems and demands immediate action.

Contents gauge

Pressure gauge



Pressure relief devices

Check outlets are unobstructed and clear of ice and that there is no evidence of tampering.

Immediately report any excessive venting or icing that may affect their operation. Relief valves may vent periodically under normal operating conditions. Report any continuous venting.



Typical tank relief devices



System damage

Check for, and report, any sign of dents, cracks or other damage to the tank or associated pipework.



4

Excessive ice build-up around operating controls

Check icing is not preventing the normal operation of safety devices, valves and vents, or access to them.

Under normal use, a small amount of frosting and ice may develop around pipes, valves, controls and vaporisers as shown in the picture opposite.



5

Frosting on tank surface

Inspect the outer skin of the tank for any new or abnormal signs of frosting.

Immediately report any abnormal frosting.

The frosting indicated in the picture opposite is an example of advanced and serious abnormal frosting. Abnormal condensation that can't be ascribed to morning frost, dew or weather conditions may appear at the first instance of a failure before heavy localised frosting develops.



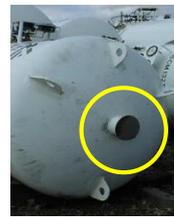
6

Gas escaping from outer jacket

Check gas is not escaping from any part of the tank surface or connections to it.

Immediately report any visible or audible escaping gas.

Vacuum insulated tanks are fitted with a vacuum protection device to prevent the outer jacket being pressurised in the event of a leak from the inner vessel or interspace pipework. The operation of this device may be visible or audible as escaping gas from a port or connection on the outside of the tank and is an indication of a serious internal problem with the tank.



Examples of vacuum protection devices.



Gas venting from a vacuum protection device.

7

General condition and security

Check the tank is secure and all valves and controls are in their correct position. Carry out general housekeeping and remove any debris. Ensure that the delivery area remains clear at all times.

NOTE: It is essential that the area around the installation is kept clear of all combustible material and that nothing is introduced that breaches separation distances.



8

Safety signs and warning notices

Check signage is in place, in good condition, visible and kept up to date.

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