BRITISH COMPRESSED GASES ASSOCIATION
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Leaflet 11

Revision 1: 2014

SAFETY CHECKS FOR VACUUM INSULATED CRYOGENIC TANKS

Users of vacuum insulated cryogenic tanks have a duty of care to ensure the equipment is operated safely on their site. Equipment suppliers assist in the provision of operating manuals and training of operational staff. It is also the responsibility of the user to ensure that this training and awareness is ongoing and current.

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

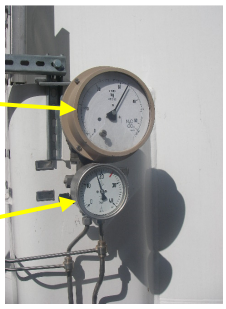
If during the following checks any adverse or abnormal conditions are seen, or there is doubt about the safety of the tank, it is to be reported to the users' management, as well as the tank owner and gas supplier. Your gas supplier can provide further technical and safety information.

Safety may be compromised when such checks are not routinely performed leading to potential equipment failure and possible personal harm. Attention is drawn to HSE Safety Alert entitled 'Restricted pipe movement in cryogenic tanks' dated 16th September 2008.

1 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.



2 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.


Typical tank relief valves

3 System damage

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

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4 Excessive ice build up around operating controls

Check icing does not prevent access to and the normal operation of valves and vents.

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

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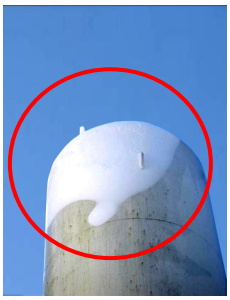
5 Frosting on tank surface

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.



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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 and/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 and/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.

These pictures show 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 vehicle access is clear.

NOTE: It is essential that the area around the installation is kept clear of all combustible material.

8 Signs

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

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