

White paper:

Cryogenic testing, be aware of 'lurking' dangers..!

With the growing potential of the LNG industry, an increasing amount of many valve manufactures are getting involved in Cryogenic testing. The standards are clear on the conditions and criteria, but are indefinite vague on operational safety. This cannot be underestimated.., be aware of lurking dangers...;

Oxygen deficiency hazards

- Liquid Nitrogen is used to cool down the valve to the desired test temperature. When the valve is submerged in 'LN', the fluid immediately starts to boil and evaporate. When evaporating, Nitrogen increases about 700x in volume at 20°C..! Nitrogen gas is odourless, colourless, tasteless, but acts as a direct asphyxiate, replacing Oxygen. It is 'heavy' and accumulate in the test pit or around the cooling tank.
- Helium is commonly used as test / tracer gas. Helium is inert and non-toxic at standard conditions however, inhaling an excess amount can be dangerous. It asphyxiates, it displaces Oxygen needed for normal respiration. Make sure to discharge the test gas outside the test room and ventilate the area when ending the test.

Oxygen level sensors and a fully integrated, correctly 'sized' exhaust system are 'essential parts' of the Cryo – test facility.

High gas pressure testing

- The Cryogenic conditions dictate Helium gas or Nitrogen gas (or a mix of both) as 'test / tracer' gas. Although it isn't easy (read costly...), prior to high pressure gas testing, the valve or at least all individual parts, must also have proven their strength and integrity by successfully passing a hydrostatic body / shell test. But, in spite of all preceded successful tests and the exclusive use of first class tools and materials, gas testing is never without risk..!

A well-constructed safety enclosure with interlock - controlled access protocol should be considered as a standard part of the Cryo-test facility.

PPE

- Unavoidably the operating personnel will be exposed to cold liquid, boil-off gas or cold surfaces. Protective clothing must always be worn to guard against these hazards.

The standard Cryogenic work wear package exists of special clothes, apron and face protection.

Ventil supplies 'turn-key' cryogenic test facilities, including; LN storage and loading facility, test gas pre-cooling and boosting system, insulated cooling tanks, manual or full automatic (computer controlled test systems, full surrounding safety enclosure and Oxygen sensor controlled exhaust system. Range: ¼ - 100", test pressure / 0 – 700 bar / 10,150 psi.

Is Cryogenic valve testing a challenge for you, and you need help..?

Get in touch, Ventil Test Equipment (www.ventil.nl)

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