Nitrogen Helium Leak Detection Services

Reduce operational risk with expert solutions and cost management

As the world moves towards carbon neutrality, ensuring process systems are leak free on start-up and throughout their operational life is becoming increasingly important. An unplanned shutdown to repair problematic pressurized connectors can have a significant impact on the environment and create a substantial financial burden for the operator.

Key to the Baker Hughes, Process & Pipeline Services (PPS) philosophies *'Driving zero leaks'* and *'Right first time'* is creating leak free joints, and a key step in this process is the verification phase. One of the most stringent methods of verification is nitrogen helium leak testing.

Leak paths that can be found in pressured systems result from numerous sources, such as faulty pressure equipment, wrongly assembled joints and instrumentation, missing or lose blanking plugs, or corroded sealing faces. All affect the safe operation of the pressurized system.

Methodology

Nitrogen helium leak testing is a method of verifying the integrity of a pressurized system prior to the introduction of operating medium, such as hydrocarbon gas or fluid.

Highly sensitive, nitrogen helium leak testing is capable of detecting leaks as small as 5 scf/year with a high level of repeatability.

Procedure

The use of helium gas for detecting leaks is a well-established technique and, when used with mass spectrometer technology or a handheld leak detection system, it is the most accurate and repeatable test available. Through a detailed engineering phase PPS will design the client's systems test packs to ensure that the process is carried out as safely and efficiently as possible while taking into account the schedule of other construction activities. When readying the system for test, each potential leak source within a designated test pack will be sealed with colored PVC tape. A full line walk will be carried out in line with the PPS leak test procedure.

Leak detection

Testing is normally carried out at 90% of design or PSV set pressure to closely simulate operating conditions. The process implemented by injecting 1% helium and 99% nitrogen test gas mixture into the system in predetermined incremental

steps/stages until the test pressure is reached.

Applications

- O&G production facilities
- Gas plants
- LNG plants
- Petrochemical plants
- Refineries

Features and benefits

- Reduced schedule and budgetary impacts associated with unplanned leak repair
- Reduces negative impact to the environment and safety due to loss of containment
- Production loses are kept at a minimum
- Ability to locate and quantify leaks easily
- Offer multi skilled crews to ensure the client is provided a cost reduction benefit without the detriment to quality

Additional Solutions

- Mechanical Joint Integrity
- System Purging
- Valve Testing
- Hydrostatic Testing
- Air Drying
- Chemical Cleaning
- Oil Flushing
- Flushing and Jetting
- Camera Inspection

Using a probe connected to either a remote mass spectrometer or a localized handheld leak detector, leaks are detected by using the probe to puncture the applied PVC tape and sample gas at each potential leak source. The gas sample is analyzed for helium content before quantifying and recording the results. All leaks above the operator's predetermined acceptable leak rate threshold are identified. The system will then be depressurized and, on completion, remedial work can be performed and a retest executed if required.

On successful completion

On the successful completion of the leak test, the system is depressurized and left in a safe, inert condition, ready for the introduction of hydrocarbons into the system.

PPS will then compile a full and traceable leak test completion package to present to the client, ensuring it meets the needs of the client's project QA/QC requirements.

With our large fleet of membrane N_2 generators, PPS can assist when liquid N_2 is not readily available. If your operation location is onshore or offshore, PPS has equipment that can operate in these environments.

Through new technology and concepts, and a commitment to continuous improvement, PPS is able to offer best-in-class nitrogen helium leak detection services to suit your specific project requirements.

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