



QUALMARK RELIABILITY TEST TECHNOLOGY

Market Leading Partners to deliver your optimal system, safety, and services for the life of your equipment. Your **Total Solution.**

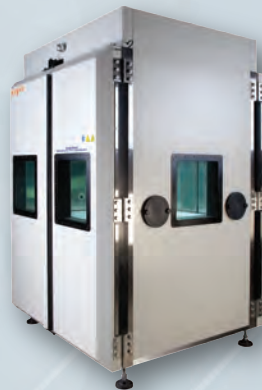
Qualmark HALT Systems

Qualmark HALT testing systems (Highly Accelerated Life Test) combine extreme temperature cycling and repetitive-shock/vibration for the ultimate in accelerated reliability testing. Qualmark chambers have been the market leader in HALT since introducing the technology in the early 1990s. Today, our technology continues to reflect the best advances in HALT/HASS system testing. Our models are the most energy-efficient on the market. The technology provides the extreme stresses necessary to rapidly find design flaws missed by traditional methods.

The table delivers six-degree-of-freedom, random, broadband excitation (10 Hz to above 5,000Hz) with a consistent power spectral density profile that eliminates "picket fencing." The thermal chamber's conditioning system features vacuum-jacketed liquid nitrogen cooling and nichrome wire heating, resulting in ramp rates of 60-100°C per minute.

Standard Features

- High Rate, High Flow Typhoon Thermal System
- xLF2 Vibration Table with PSD Management
- Vacuum Jacketed Manifold
- Allen-Bradley PLC Control
- Windows 10 system with Labview operation and PLC-based controls
- Typhoon Manager Software
- Wall Panel Access Port Option



Airgas LN2 Infrastructure, Supply, Safety and PPE

Airgas, an Air Liquide company, is a leading supplier of industrial gases, as well as gas delivery equipment systems and safety products and PPE. With a large national footprint including production facilities throughout the U.S. and gases in any supply mode, you can depend on a continuous and reliable supply of bulk LN2 to meet your needs.



an Air Liquide company



In addition, Airgas has a network of experts including bulk gas specialists to help assess your current gas and delivery processes, and identify areas to improve your delivery system to meet your specific HALT/HASS requirements. Airgas QSSP- and OSHA 30-certified safety specialists are available to help assess safety risks and recommend the appropriate products for your team.

Together, ESPEC and Airgas aim to optimize your total system including gas, installation and ongoing operations by delivering the most efficient and reliable solutions available in the HALT industry. In addition, we are committed to helping you improve energy efficiency and reduce your carbon footprint by running low carbon ECO ORIGIN™ LN2 in your HALT/HASS chambers. | Airgas.com

Safety Measures, Education and Training

Safety isn't expensive, it's priceless ...



ESPEC's goal far surpasses the pursuit to identify and provide the best testing solution for your needs, it extends deep in to your long-term success, efficiency, safety, and technology know-how. With our partners at Airgas and Midwest Cryogenics, we can collectively deliver an accurate, and optimally designed safety system specific for your chamber,

testing, and facility. We will work with you to identify the appropriate O2 monitor, E-stop, and other measures to ensure your team and company are operating in as safe an environment as possible. ESPEC Knowledge & Training:

The objective of ESPEC's Solutions Group is to add to the value derived from accelerated testing by tailoring training services to deliver customer-specific program optimization. The educational value of the Solutions Group can dramatically improve reliability program outcomes that will quickly drive increases in product profitability. Educating and preparing your team for HALT and HASS carries its return on investment in the overall quality and reliability of your products.

Acme Cryogenics VJ Piping



Midwest Cryogenics, an Acme Cryogenics Company, has long partnered with Qualmark HALT and HASS technology and have an intimate familiarity with the technology, demands of testing, and how to add acute efficiency to your overall system with the best piping logistics and products. The most cost-effective way to transfer cryogenic liquids - Vacuum Jacketed Pipe (VJP) is the preferred piping solution for the safe, reliable, cost-effective transfer of LN2.

Each VJP project is managed by a sales engineer, in tandem with ESPEC, that has been trained in ASME B31.3 pipe design, cryogenic safety and VJP project management. With their nationwide field service team, installation, preventative maintenance, and repair is seamless, and can all be coordinated through your one ESPEC point of contact. Midwest brings the technical expertise full circle with ESPEC's Qualmark HALT technology and services, and Airgas' premium LN2 supply, storage, and delivery. Midwestcryo.com

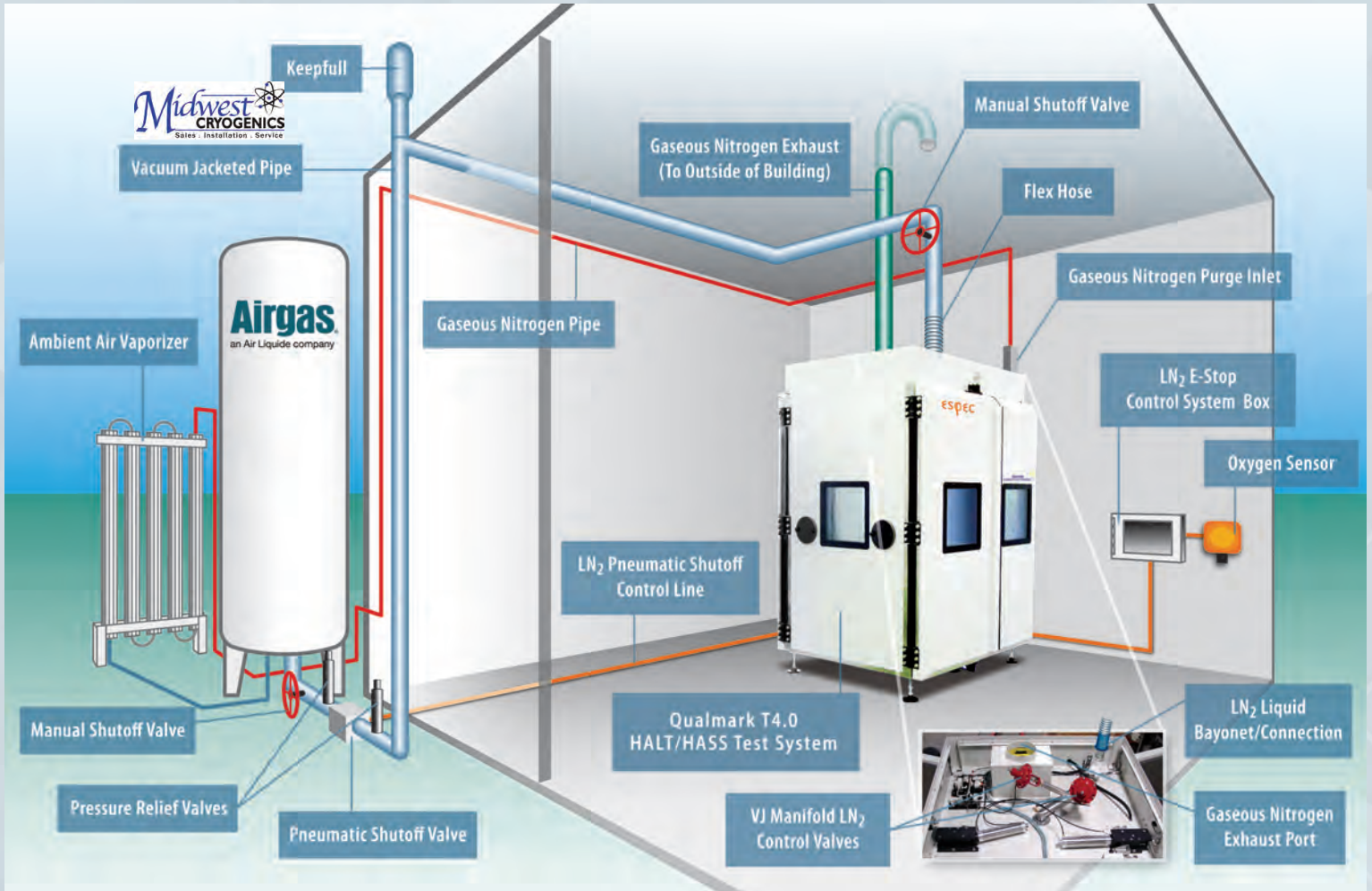


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Streamline your entire process by working with one team and single point of contact - System, LN2, Piping, Safety, Education, Training.

Complete Customer Value Proposition

Example LN2 Infrastructure and Installation



ESPEC Total Solution Key Contacts:

ESPEC Team:

RSM Name: _____ Email: _____ Phone: _____
 Regional Sales Rep Name: _____ Email: _____ Phone: _____
 ESPEC HALT Expert/Solutions Group Contact: _____ Email: _____

Airgas Team:

Bulk Tank Specialist Name: _____ Email: _____ Phone: _____
 Account Manager Name: _____ Email: _____ Phone: _____
 Airgas ALTEC Expert Name: _____ Email: _____ Phone: _____

Midwest Cryogenics Team:

Paul Trcka - General Manager and Project Lead: paul@midwestcryo.com | 612.987.1273