Intended Use Guidelines for Qualmark Thermal/Vibration Chambers

Highly Accelerated Testing (for both design and production)

- Qualmark chambers are designed for HALT applications utilizing a step stress approach in subjecting products to sequential and incremental thermal and vibration stresses to identify design limitations of a product. HALT is intended to discover the stress limits of a product and identify product weaknesses. Qualmark can provide basic HALT guidelines and assist in the development of your HALT application.
- Qualmark chambers are also designed for HASS applications utilizing a production screen. This production screen is determined using the same accelerated techniques as HALT, but de-rated. Its purpose is to monitor the manufacturing process for deviations, by screening production units introducing stresses that are specific to the products. The HASS profile is created to enhance additional failure precipitation and detection. Qualmark can provide basic HASS guidelines and assist in the development of your HASS application.
- Qualmark chambers are not intended for life testing of a product. Using the chamber in this manner can cause premature component wear and my void the warranty. Contact Qualmark for assistance in this area.

Operating Limits

- Qualmark HALT/HASS chambers are designed to operate through their entire air temperature range of -100°C to +200°C. During HALT/HASS applications the chamber may be stressed with short extreme temperature dwells of less than three (3) hours. The temperature dwells may include step stressing as well, which is dwelling at specific temperatures for ten (10) minutes (or as long as it takes to perform the product's diagnostic suite), then proceeding to the next temperature dwell point.
- Qualmark HALT/HASS chambers are designed to operate through their entire table vibration range of 5Grms to 50Grms (with no load). During HALT/HASS applications the table may be operated with extreme vibration steps of less than three (3) hours. The vibration steps may include step stressing as well, which is dwelling at specific vibration levels for ten (10) minutes (or as long as it takes to perform the product's diagnostic suite), then proceeding to the next vibration dwell point.
    - The vibration table has a maximum load limit based on the chamber model. For the specific load limits, refer to the *Site Preparation Manual for Qualmark Chambers* (130-0008). Exceeding the load limits of the table may cause premature wear or damage to the table and/or the chamber.
    - Using rigid bodies, like a metallic module, may lower the table vibration level since it tends to stiffen the table and cause the table response to change. Monitoring the product vibration versus monitoring the table vibration is recommended. Correct fixturing of the product to the table is an essential part of the HALT/HASS process. Fixturing applies even thermal and vibration stresses to the product under test. Improper fixturing may cause premature wear or damage to the table and/or the chamber. Contact Qualmark for assistance in developing product fixturing needs.
- Operating the chamber outside of these ranges can cause premature wear or damage to the chamber and table and may void the warranty. Contact Qualmark for assistance in this area.