



MIL Standard Shock and Vibration Testing

June, 2005 – An independent laboratory conducted MIL standard shock and vibration tests on an Exlar GSX30 linear actuator.

Vibration Endurance

The vibration test was conducted in accordance with MIL-STD-167B. The vibration frequency was swept from 4 to 22 Hz. MIL-STD-167B requires an exploratory vibration test (10-minute resonance survey sweep) a variable frequency test (5-minute dwell at each frequency) and a 2-hour endurance test at the resonant frequency. Because no resonance was observed during the survey, the endurance test was conducted at 22 Hz. The Exlar linear actuator was subjected to each test sequence in three different axes and two mounting configurations and was operational during the vibration exposures.

Results

No physical or mechanical degradation was observed during or after the testing. After each sequence, the actuator was operationally tested for 30 minutes. The actuator performed satisfactorily during the operational testing.

Mechanical Shock

The Exlar GSX30 was subjected to a Medium Weight Shock Test in accordance with MIL-S-901D. The test was performed with the linear actuator oriented in three different axes and two mounting configurations for a total of 18 blows. The linear actuator was operational during the shock testing.

Results

Accelerometer data reflected shock acceleration at the front flange of the actuator up to and exceeding 750g. The actuator was inspected after each blow and subjected to a 30-minute operational test after each sequence of three blows. The linear actuator displayed no physical or mechanical degradation and operated satisfactorily during the operational testing.

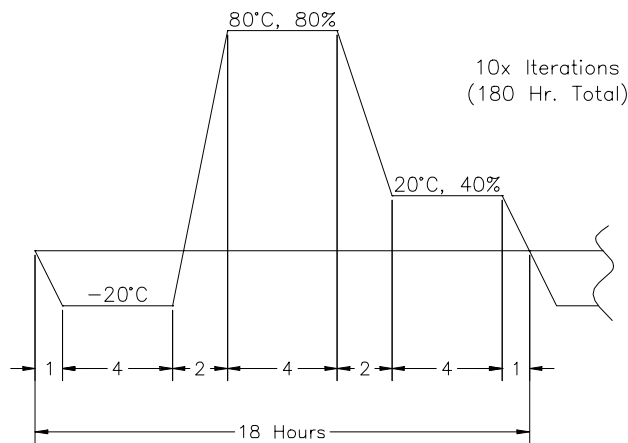


SHOCK, VIBRATION AND ENVIRONMENTAL TEST RESULTS

December 2, 2002 -- Exlar's integrated motor linear actuators have been tested by an independent testing facility for temperature, humidity, shock and vibration with the following results.

Temperature and Humidity Exposure

Actuators were subjected to 180 hours of temperature/humidity exposure as shown in the profile below.



After removal from the test chamber, the sample displayed no physical or functional damage.

Vibration Endurance

The test samples were mounted to a holding fixture secured to a vibration shaker table. Control and response accelerometers were placed near points of attachment. Vibration frequency was swept from 20 Hz to 2500 Hz at a sweep rate of one (1) octave/minute. The input level of 24.5 m/s² (2.5 G's) was applied to the sample throughout the frequency range. The frequency range was cycled for 100 sweeps, approximately 11.5 hours.

Results showed no physical or mechanical degradation.

Mechanical Shock

The test samples were mounted to an aluminum holding fixture, capable of transmitting a shock input. A control/measurement accelerometer was placed near the point of sample attachment. The shock pulse was a half sine waveform, 11 milliseconds in duration with a 490 m/s² (50 G's) input. Three shocks were applied in each direction (positive and negative) or three (3) mutually perpendicular axes, for a total of 18 shocks.

Post-test evaluation including operational tests showed no physical or mechanical degradation.