

## Reliability Testing for Ceramic Monoblock Filters

### General Information

CTS Ceramic Monoblock Filters are tested for long-term reliability during New Product Qualification as well as during weekly and monthly reliability audits. Unless otherwise specified, the minimum requirement is defined as following:

### Temperature Test

Data is taken at room temperature, the specified high and low temperature and again at room temperature to assure initial performance over the entire temperature range. All electrical parameters must meet all specifications as shown on the CTS data sheet.

### Thermal Shock

This test is performed in an air-to-air thermal shock chamber. Each temperature cycle normally consists of 10 minutes minimum after it reaches  $-40^{\circ}\text{C}$  followed by 10 minutes minimum after it reaches  $+85^{\circ}\text{C}$  with a 20 second maximum transition time between temperature extremes. The normal test duration is 32 cycles. All test results must meet the electrical specifications shown on the CTS data sheet after thermal shock.

### Humidity (Moisture Resistance)

The filters are preconditioned at room temperature and humidity for 1 hour. The environmental chamber is set to  $+70^{\circ}\text{C}$  and a controlled relative humidity of 90% for 240 hours soak time. The filters will be removed and stored 4 hours at normal environmental temperatures and humidity before being tested. All test results must meet the specification after humidity soak.

### High Temperature Storage

The filters are placed in a temperature chamber at specified highest storage temperature for 96 hours. Filters will be allowed at least 4 hours at normal environmental temperatures and then tested. All test results must meet the specification after high temperature storage.

### Low Temperature Storage

The filters are placed in a temperature chamber at specified lowest storage temperature for 96 hours. Filters will be allowed at least 4 hours at normal environmental temperatures after low temperature storage and then tested. All test results must meet the specification after low temperature storage.

## **Random Vibration**

The filters are subjected to random vibration from 20 to 2000 Hz using the following Power Spectral Density (PSD) profile. It is a +3 dB / octave from 20 to 80 Hz, then 0.053 g<sup>2</sup>/Hz or at 8 g's RMS level from 80 to 350 Hz and finally at -3 dB / octave from 350 to 2000 Hz. The PSD tolerance is +/- 3 dB from 20 to 1000 Hz and +/- 6dB above 1000 Hz. The analyzer bandwidth is to be set at 25 Hz BW from 20 to 200 Hz, 50 Hz BW to 1000 Hz, and finally 100 Hz BW to 2000 Hz. The test time is 15 minutes per plane. Upon completion, the device must meet the electrical specifications and have no visual defects

## **Mechanical Shock**

Subject samples to mechanical shock consisting of 6 impacts in each of three mutually perpendicular planes, three in each direction of each plane, a shock of 3000 G's half sine wave (0.3 ms duration). Upon completion, the device must meet the electrical specifications and have no visual defects.