

# Fluid Susceptibility Testing

A full range of cost-effective environmental testing services



Fluid Susceptibility and Water Proofness testing of materials determines the effects and resistance of exposure to fluids.

These tests expose the test article to various scenarios of dripping water or pooled water, including fuels, lubricating oils, solvents, cleaning fluids, and many others to verify the unit will fully operate in the given condition.

Product manufacturers subject raw material to fluid susceptibility testing because there is a high probability that fluids will contaminate the product during its life cycle. The fluids mentioned above (fuels, oils, etc) commonly contaminate material either intermittently or over long periods. Physical, chemical, and electrical properties are inspected during and after testing. For example, the product should not show any cracking or swelling when exposed to fluids.

The fluid susceptibility testing procedure depends on some variables such as fluid used and standard. Its fluid solution or chemical can be immersed, sprayed, brushed,

etc. The test laboratory should typically have a device to measure fluid temperature, pre-test/pre-soak equipment, and appropriate post-measurement equipment. Each fluid or chemical's datasheet and product specification must be reviewed for safety and health hazard reasons.

Raw material and component manufacturers test for fluid susceptibility and contamination effects. Fluid resistance is important for products used in different environments such as low/high temperature, indoor/outdoor, and land/air. Electrical qualification testing also tests for fluids like alcohol cleaner.

An example of a fluid susceptibility test method standard is FED-STD-791 which is the federal standard for testing lubricants, liquid fuels, and related products. The document covers a wide range of subjects from cloud intensity to dirt deposits. MIL-PRF-28876, which is a qualification test program for fiber optic connectors, also calls out fluid testing. The requirements are that the connector shall not reveal swelling or softening of the material. Also, the sealing capability of the connector and other detrimental effects shall occur.

Experior Labs stocks common contaminants of interest include cleaning agents, lubricants, insecticides, and fuels. Experior also stocks some of the more exotic fluids used for military and aerospace applications as detailed in MIL-STD-810, RTCA/DO 160, EIA-455-12, EN3909 and has the ability to expose components and assess their reactions in accordance with standardized industry test methods. Our laboratory has the equipment and measurement devices to test many different products. As always, Experior engineers and technicians take the necessary safety precautions before, during and after the test.

## Climatic

- Temperature
- Temperature shock, air-air, liquid-liquid
- Humidity, 5% to 98% RH
- Walk-in temperature and humidity chambers
- Altitude
- Icing
- Thermal vacuum
- Hydrostatic and pressure cycling

## Mechanical

- Vibration
- SRS and classical shock
- Impact and drop
- Tensile and compression
- Cable elongation and tensile
- Fiber micro/macro bending and coating strip force
- Various flex, twist and stress tests
- Custom mechanical setups for various applications

## Materials

- Salt fog and cyclic corrosion
- UV and weathering
- Chemical and fungus resistance
- Fluid and ground water immersion
- Sand and dust
- Rain (wind driven)
- Flammability and fire wall
- Rockwell hardness

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