

Environmental Simulation

The environmental test center of cetecom advanced is accredited according to DIN EN ISO/IEC 17025 and offers a wide range of state-of-the-art test equipment to assess the resistance, long-term behaviour and aging effects of a product under various simulated conditions. cetecom advanced tests according to international standards or customized standards which include also those of many automotive manufacturers.



TEMPERATURE & CLIMATIC TESTS

During temperature and climatic testing, a product is subjected to a variety of real load scenarios - from heat to cold, from humidity to pressure.

Through the cyclical and thermal load, conclusions can be drawn about the resistance of the test item.

Test facility features:

- Test chambers up to 2,500 x 2,600 x 2,100 mm
- Temperature range: -80 °C up to 300 °C
- Thermal shock testing: -80 °C up to 200 °C
- Temperature changing rates up to 5 K/min normal, more than 10 K/min under shock conditions
- Humidity < 10% r.H.; > 95% r.H. and in between
- Tests under inerting gas atmosphere
- Dewing test

Testing according to the following standards:

- DIN EN IEC 60068-2-1, -2, -14, -30, -38, -41, -48, -78
- DIN ISO 16750-4
- ISO 19453-4

MECHANICAL CRASH TEST

The mechanical crash test bench is integrated in a protected area and can be used universally. We can perform with defined acceleration/deceleration and pulse duration (positive and negative direction).

Test facility features:

- High velocity shock up to 70 km/h
- Testing mass up to 600 kg
- Mounting surface on the sled: 1,200 x 1,200 mm, extension plates can be used
- Max. force: 900 kN
- Max. acceleration: 60 g
- Max. stroke: 1,100 mm
- Crash block: 8 t

MECHANICAL VIBRATION & SHOCK

Various shakers with forces up to 300 kN and a climatic chamber size of 2,500 x 2,600 x 2,100 mm and even more for climate-independent shaker tests.

Test scope:

- sine, random, sine on random, random on random
- mechanical shock
- shock response spectrum (SRS shock)
- resonance analysis
- real time profiles

Test facility features vibration:

- Displacement up to 3 inches
- Testing mass of max 2,500 kg
- Sinus up to 220 g (pk)
- Random Vibration up to 180 grms (effective)

Test facility features shock:

- max. shock acceleration: up to 500 g
- max. testing mass: up to 17,600 kg

Testing according the following standards:

- DIN EN IEC 60068-2-6/-27, -29, -47, -57, 64, -80
- DIN ISO 16750-3
- ISO 19453-3

CORROSION TESTS

In the walk-in salt spray chamber and in our cyclic corrosion test chamber with air conditioner the corrosion behavior due to the exposure of salt fog or salt shower combined with adjustable climatic conditions can be simulated in fast motion.

Test facility features:

- Chamber base area: 3,000 x 2,000 mm
- Floor load: up to 1,000 kg/m²

Testing scope:

- Corrosion tests according to DIN EN ISO 9227, DIN EN IEC 60068-2-11, -52 and ASTM B 117
- Condensing water atmospheres acc. ISO 6270-2

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IP-CLASSIFICATION

A method to classify the degrees of protection provided by the housings of electrical devices. This means the ingress of moisture or dust.

Testing of the protection against several kinds of water according to the following standards:

- IP code testing acc. DIN EN/IEC 60529 and ISO 20653
- IPX1 until X8, X6K and IPX9K / IP1X-6X

Water test facility features:

- Space in water test chamber 2,500 x 6,000 mm
- Turntable diameter: 1,500 mm
- samples up to 300 kg can be handled

Dust test facility features:

- internal dimensions: 2,500 x 3,500 x 1,900 mm
- max load 5,000 kg

Testing of the protection against dust according to current standards with several types of dust:

- Talcum dust
- Arizona dust (fine or coarse)

ALTITUDE & LOW PRESSURE TESTS

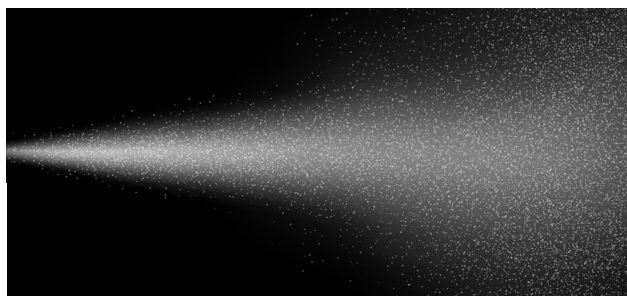
This test procedure enables the simulation of aircraft transportations under negative pressure conditions. Aerospace applications can be tested as well.

- Generating low pressure up to 100 mbar (absolute)
- Appropriate for sample sizes up to 2,000 x 1,500 x 500 mm and a testing mass of up to 500 kg
- Altitude tests / Low Pressure tests according to DIN EN IEC 60068-2-13, DIN EN EC 60068-2-41 etc

CHEMICAL RESISTANCE

In general, the term 'chemical resistance' refers to a material's resistance to the action of chemicals without the removal of material, as is the case in corrosion tests.

- Chemical tests according to DIN EN 60068-2-74 / DIN ISO 16750-5 / VW 80000 / ISO 19453-5 etc.
- Application methods: Spraying / Brushing / Wiping / Pouring / Dipping / Immersing



SUN SIMULATION (ARTIFICIAL WEATHERING)

Almost all products are exposed to the solar spectrum during their lifetime and have to withstand them. Sun simulation is used to determine the aging behavior of devices and materials under different weather conditions.

Testing according to the following standards:

- DIN EN IEC 60068-2-5 and DIN 75220
- ISO 4892-1, -2, -3
- VW PV 3929, -3930
- SAE J2527, -J2412
- ASTM G155 etc.

Test scope:

- Outdoor and indoor exposure
- Temperature range: -40 °C to 100 °C
- Load capacity: 100 kg
- max. relative humidity: 90 %
- Front- & backspray (if needed)

ICE WATER SHOCK TEST

This test simulates a thermal shock induced by ice water and applies to products in the splash areas of the vehicle. The purpose of this test is to simulate ice water splashing over a hot system/component.

Test scope:

- Ice Water Splash Test
- Submersion Test

Test facility features:

- Test samples up to a size of 240 x 260 x 380 mm
- Water Temperature range: -2 °C up to RT
- Chamber Temperature range 0 °C up to 110 °C
- Transfer Time < 30 sec
- Splash water up to 60 l/min

Testing according to the following standard:

- ISO 16750-4

HIGH-SPEED RECORDING

We record the test and the changes of the test item during the test procedure.

- 10.000 fps (frames per second) in 640 x 480
- 5.300 fps in HD Ready (1280 x 720)
- 2.500 fps in Full HD (1920 x 1080)

Measurements can be taken up to 100 kSa/s, image-synchronized as well.

TEST TAILORING

- Tailoring according to DIN EN 60068-1
- Consulting in life time, functional tests, etc.
- Development of individual test plans and specifications