With vibration and high speed to top quality

Vibration test chambers WT/V and WK/V
Additional safety...

...to temperature/humidity testing vibration test – for safety.

High product reliability is a basic requirement for today’s competitive market and is often the only difference between the products of various manufacturers.

The reliability of electronic products can be substantially improved by the use of environmental stress screening (ESS) techniques. ESS is a process that accelerates the occurrence of latent defects before delivery. This will minimize the risk of errors and failures of products and simultaneously improve the reputation of a company.

Where thermal/climate tests are not sufficient the test severity can be increased by the addition of a dynamic parameter vibration.
... convincing product advantages by ESS-tests

- Improvement of product reliability. The products do not simply function, they operate correctly for a long period of time.

- The quality itself is substantially improved, customer satisfaction increases and the sale of reliable products likewise. Reliable products ensure that the reputation of the manufacturer on the market remains a good one.

- ESS means reduced costs as product failures do not occur during the warranty period when they are already in the possession of the customer.

- ESS reduces the risks connected with the launching of a new product or a new technology.

- ESS means quick “feedback”. Weak points of products are detected in the manufacturer’s plant at an early point of time and can be remedied immediately.
During the ESS test, the products are subject to a precisely defined stress.

In practice, the following ESS methods have prevailed:
- Temperature stress
- Vibration stress
- Humidity stress in conjunction with electrical stress.

Test tailoring is essential so as to ensure that sufficient stress is applied so as to precipitate early failures, but should not be so severe as to cause undue damage to good products.

**Effectiveness of environmental screens**

1. Temperature cycling
2. Vibration, Random
3. High temperature
4. Electrical stress
5. Temperature shock
6. Vibration, sinus
7. Low temperature
8. Vibration sinus, sweep
9. Combined test
10. Mechanical shock
11. Humidity
12. Acceleration
13. Low pressure

A = Weighted rank
Our stress screening test chamber series was specially designed for temperature stress. The WK series of climate test chambers is available for humidity stress. Additionally, WT/V and WK/V chambers are available for combination of the above parameters with vibration.

Environmental stress screening on PCBs (or other products) is achieved by thermal stress with quickly changing temperatures. ESS is the most effective method of detecting poor soldering joints as well as manufacturing errors before delivery.

Typical ESS test profiles have a temperature ramping rate of 5...15 K/min over a wide temperature range (see technical data on page 10/11).

Weiss Umwelttechnik has developed a range of systems especially for this purpose which does more than justice to the above mentioned requirements.
Vibration test chamber configuration . . .

The test systems based on the well-tried modules of the WT and WK series with increased power for heating, cooling and circulating air and test chamber volumes of 600 to 2200 litres are capable of meeting virtually all requirements. The WK/V series also complies with customary climatic test standards.

The technology of the systems, as is to be expected from the ergonomic design, provides optimum operation and reliable functioning:

- Powerful, homogeneous temperature and/or climate conditioning of the test chamber.
- The specimens are protected by an independent temperature measurement and monitoring.
- Optimized air ductwork for all test chamber volumes.
- No obstruction from struts or legs below test space.
- Colour touch panel with simple, menu-guided operation.
- 32 bit measuring and control system.
- Easily accessible maintenance elements ensure minimum service times.

- Automatic water replenishment without interrupting operation with large storage tank for the WK/V series.
- Environmentally friendly, high-quality insulation.
- Precise adjustment of system height to accommodate standard shakers.
- Optimal, compact external dimensions.
- Minimal installation work on site.
- Embossed stainless steel test space with integral shelf support.
- Easy-to-clean test chambers thanks to special welding and molded racks.
- Tightly sealed and easy-to-clean surfaces thanks to powder coating.
- Simple integration of all standard shakers.
- Networking of chamber control software and shaker control software possible (TCP/IP-Protocol).
... and functional design
Construction features and function principle

The beautifully designed outer casing is made of corrosion-resistant, galvanized sheet steel with an environmentally friendly coating. The test chamber door is hinged on the left and has optimum contact pressure when closed.

The machine unit with the large cooling units is located underneath the test chamber in a maintenance-friendly position.

The entire power electronics is located in a switch cabinet at the back of the test chamber.

Every electronic function circuit has its own safety mechanism which switches off the relevant function circuit and/or the entire test chamber when faults occur.

The test space is made of high-gloss polished, high-quality stainless steel and is vapor-tight welded. The evaporator, heating elements and the large ventilation equipment with external drive motors are installed behind the conduit which is at the back of the test space.

A special air ductwork system together with the enhanced temperature conditioning systems ensures quick and even temperature conditioning of the specimens.

The test chamber is equipped with separate sensors to protect the specimens irrespective of the temperature control system. Additional ducts in the side panels are provided for the electrical connections of the specimens from the outside.

The temperature conditioning system of the WK series is also equipped with humidification and dehumidification equipment with a humidity sensor. The humidity sensor is located in front of the specimens in the air stream together with the control sensor for the temperature.

Standard version

- Chamber height adaptable to shaker system.
- Low/high temperature safety cutout as per EN 60519-2 (1993) with separate sensor, thermal safety class 2.
- Serial interface RS 232 C, 4 potential-free switching inputs and outputs each.
- Contactless switching of heating elements.
- 50 mm Ø entry port in the left and 125 mm Ø in the right side panel.
- Water-cooled condensers.
- Control system SIMCON/32*-NET with colour touch panel.

Additional features for WK/V series

- Capacitive humidity sensor.
- Special temperature conditioning system in the climate working range for optimum temperature and humidity constancy.
- Low water indicator.

Options

- Mobile version.
- Electro-mechanical height adjustment.
- Test chamber floor without vibrator port.
- Test chamber floor with rectangular port for slip table.
- Ethernet/LAN interface.
- Software package SIMPAT.
- Additional potential-free switching inputs and outputs.
- Measured data recording system for Pt 100 and voltage signals ± 10 V.
- Configuration modules for interface standards e.g. RS 422, RS 485, IEEE 488.2 and optical waveguide.
- Analog outputs for set and actual values.
- Additional Pt 100-sensor/thermal elements.
- Door with window.
- Door with window and reach-through openings.
- Fresh air purge system.
- Adjustable air speed.
- Entry ports 50 mm, 80 mm, 125 mm Ø.
- Other mains supplies and frequencies.
- Air-cooled condenser.
- GN₂-purge.
- LN₂-shock cooling.
- Compressed air drying for protection against condensation.
- Sound insulation.
- Notches.
- DKD-calibration.

For WK/V series

- Water demineraliser.
- Dewpoint extension in the climate range.

Further options and special accessories on request.
... Operation and documentation

... convenient and stress-free operation

The Vibration Test Chambers are equipped with the self-monitoring, digital 32-bit measuring and control system SIMCON/32®-NET. This system coordinates all control functions. Integration of the test unit into your computer network is easily possible via Ethernet/LAN interface (RJ 45). Input functions and display of the operating parameters are effected via the graphic colour touch panel.

Additional features:
- High-resolution colour display (VGA).
- Operating and error display in clear text.
- Operation by simply touching the function symbols.
- Program editor and program storage for up to 100 programs.
- Password protection.
- Menu-guidance.

... the right software as an optimum extension


This means controlling the test sequence, storing measured data, creating comfortable test programs with the graphics editor and printing the measured data in the form of a graph and copying in other programs for evaluation purposes. Max. 99 systems can be networked.

Thanks to an internal interface, the software is compatible with Microsoft Word, Microsoft Paint, Microsoft Excel, National Instruments Labview and special user software.

Symbolic editor

Graphic display
Technical data...

### Vibration test chambers

<table>
<thead>
<tr>
<th>Type</th>
<th>WT/V - WK/V</th>
<th>WT/V – WK/V 5 K/min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>600 /40/5/V</td>
<td>600 /70/5/V</td>
</tr>
<tr>
<td>Test space contents</td>
<td>Liter</td>
<td>600</td>
</tr>
<tr>
<td>Test space dimensions</td>
<td>Height mm</td>
<td>950</td>
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<tr>
<td></td>
<td>Width mm</td>
<td>800</td>
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<tr>
<td></td>
<td>Depth mm</td>
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<tr>
<td>Outside dimensions</td>
<td>Height mm</td>
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<td></td>
<td>Width mm</td>
<td>1225</td>
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<tr>
<td></td>
<td>Depth mm</td>
<td>2860</td>
</tr>
<tr>
<td>Chamber width (incl. colour touch panel)</td>
<td>mm</td>
<td>1500</td>
</tr>
<tr>
<td>Height (up to bottom side test space floor min/max)</td>
<td>mm</td>
<td>660/1380</td>
</tr>
<tr>
<td>Largest shaker port diameter</td>
<td>mm</td>
<td>680</td>
</tr>
<tr>
<td>Largest slip-table port</td>
<td>mm</td>
<td>600*600</td>
</tr>
</tbody>
</table>

#### Performance for temperature tests

| Temperature range | °C | -40…+180 | -70…+180 | -40…+180 | -70…+180 | -40…+180 | -70…+180 |
| Change rate (1) Cooling K/min | 5.5 | 5.0 | 5.5 | 4.5 | 6.5 | 6.0 |
| Heating K/min | 5.0 | 5.0 | 5.5 | 5.5 | 6.0 | 6.0 |
| Heat compensation at +20 °C W | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 |
| Temperature fluctuation K | ±0.1 to ±0.5 in time, ±0.5 bis ±2.0 spatial |
| Climate calibration values | +23 °C and +80 °C |

#### Performance for climate tests

| Temperature range | °C | +10 … +95 |
| Dewpoint range (5) °C | +4 … +94 |
| Humidity range | % r.F. | 10 … 95 |
| Humidity fluctuation | % r.F. | ±1 to 3 in time |
| Temperature fluctuation K | ±0.1 to ±0.3 in time, ±0.5 to ±1.0 spatial |
| Heat compensation (2) W | 500 |
| Climate calibration values | +23 °C / 50 % r.h. and +95 °C / 50 % r.h. |
| Electrical connection | 3/N/PE AC, 400 V ± 10 %, 50 Hz |
| Max. connected load kW | 11 | 14 | 21 | 24 | 26 | 34 |
| Max. current consumption A | 18 | 26 | 39 | 41 | 41 | 50 |
| Sound pressure level – 1 m from the front (3) dB (A) | 68 | 71 | 75 | 76 | 76 | 77 |
| Cooling water consumption (4) max. m³/h | 2.2 | 2.7 | 3.3 | 3.8 | 4.1 | 6.6 |
| Weight kg | 1000 | 1075 | 1450 | 1600 | 2100 | 2500 |

Performance data refer to +25 °C ambient temperature
(1) Change rate as per IEC 60068-3-5, measured in the supply air stream
(2) At +25 °C to +90 °C, humidity to max. 90 % r.h.
(3) Free field measurement as per DIN 45635, Part 1, accuracy class 2
(4) At a cooling water temperature of +28 °C and temperature difference of 5 K, water temperature +12 °C to +28 °C
(5) Data only valid with blank floor element
We reserve the right to make any technical alterations.
Some equipment photos show chambers with optional accessories.
A complete line of systems is available offering test space volumes ranging from approx. 34 l to 2,160 litres, a working range from –75...+180 °C and relative humidity values ranging from 10...98 % r.h.

We also offer an extensive line of field-proven test systems specially for simulating exposure to weather, temperature shock, corrosion and long-time tests for application in research, development, quality control and production.

Of course, Weiss – as one of the leading producers of environmental simulation systems world-wide – offers the entire spectrum of high-tech test systems starting from a series of cost-effective test systems up to customized walk-in chambers and in-line systems.

If it’s know-how, service and reliability that you are looking for – contact Weiss Umwelttechnik.