

Lightning Speed ...

Vötsch
Industrietechnik



... superb acceleration rates with
temperature shock test chambers

Systems for Rapid Temperature Cycling ...

ESS - Environmental Stress Screening ... tested for absolute reliability!

When performing qualification tests on materials and components, the application of tests applying high and low temperatures do not always bring about satisfactory results. For rating the reliability of materials and components, additional stressing applying rapid temperature changes often offers better results.

Environmental Stress Screening (ESS) is a process to provoke latent flaws in a product before it leaves the factory. Hence, ESS is always applied if the reliability of a product must be enhanced.

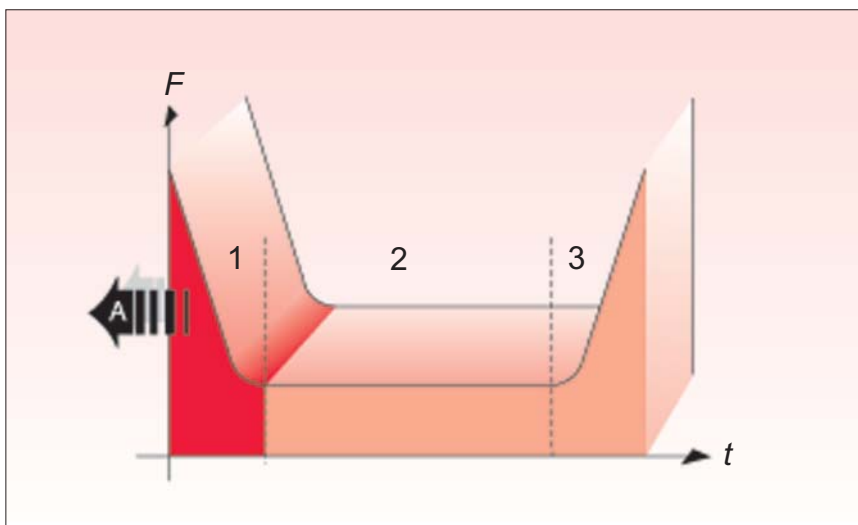
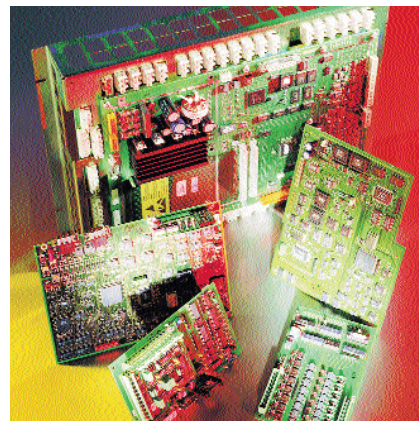
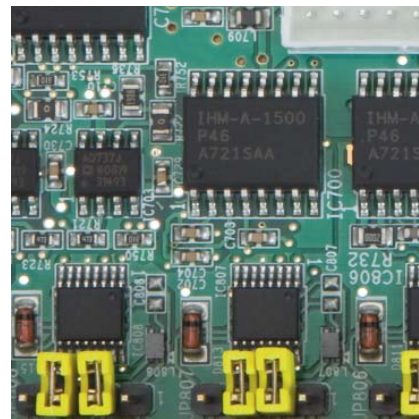
Our shock test systems for ESS allow the realisation of this process.

We can simulate all natural temperatures which, when considering the fields of aviation and aerospace, range between -65°C and $+180^{\circ}\text{C}$.

Rating with regard to stressing caused by changes of temperature is possible by applying the methods stipulated in IEC 60068-2-14, Test Na (rapid change of temperature).

However, one must consider that the selection of extreme temperatures must be optimized (test tailoring).

The application of rapid temperature cycling is the most effective manner of creating premature failures of products in the production phase. This means that ESS is a process for screening out passed/ failed components.



Life time graph of electronic components

A = ESS moves these failures from field to factory, F = Failures
 t = Time, 1 = Infant mortality, 2 = Operational lifetime, 3 = Wear out phase

... Temperature Shock Test Chambers

... VT³ 7006 S2 and VT³ 7012 S2 Temperature shock test chambers with new modern design and many innovative extras

The modern appearance of this new systems and technical optimizations position Vötsch, once again, a step ahead of the rest.

The result are systems offering performance features that are far above standard.

Particularly for tests with either small test specimens or only a small number of test specimens our powerful little „shocky“ with 60 l test space volume is available.

With new modern design now also our Temperature Shock Test Chamber VT³ 7012 S2 is available.

- Cradle load 20 resp. 50 kg
- Systems that not only offer high performance but that are also extremely quiet, a sound level of 58 dB(A)
- High temperature changing rate for fulfilling the most crucial standards
- Large port for the supply/ measurement of specimens
- Temperature conditioning of the hot zone from +50 °C to 220 °C (optional to +250 °C) Temperature conditioning of the cold zone from -80 °C to +70 °C
- Volume compensation system for long-term operation integrated in the machine compartment
- High resolution colour touch-panel with graphical display for the easy processing of environmental simulation programs
- Additional features and equipment such as air-cooled resp. water-cooled refrigeration cycle and larger-sized ports are available upon request



Shock test-systems - 2-zone design ...



Temperature shock test chambers VT³ 7006 S2, VT³ 7012 S2 & VT 7030 S2

In addition to temperature stressing, extremely rapid temperature cycling rates in the range of -80 °C to +220 °C result in the extremely high mechanical stressing of test specimens. If electronic components are exposed to this severe temperature cycling, weak points are revealed rapidly.

By assigning our shock test chamber, you not only reduce the number of premature failures but also increase the reliability of your products. It goes without saying that our systems fulfil the requirements of international testing standards such as DIN, IEC and MIL.

The principle of the vertical arrangement of the test zones of our shock test chamber has proved to be highly successful. A ball spindle drive ensures reliable guidance of the cradle.

Air guidance facilities, designed according to experience gained from the field, combined with high air circulating rates result in rapid temperature cycles and a uniform distribution of temperature in the test space.

1000 cycles are possible **without defrosting**. This means we can guarantee virtually constant availability of the system.

The specimens in the cradle with removable guards on all sides are as well protected as in a safe. The integrated safety systems wrap up the image of this application-oriented shock test system (e.g. only 1.9 m² storage area etc.).

Thanks to appropriate design techniques (water cooling, sound insulation), a relatively low noise level for this type of system has been achieved.

Besides the 60 l and 120 l test system we also supply (especially for the screening of assemblies) a 300 l system - a unique system offering a most favourable cost-benefit ratio.

Our test systems allow you to expose 100 kg test specimens to thermal stress.

Other Features:

- Minimum energy consumption
- No compressed air required
- Chloride-free refrigerant
- Multifunctional application:
The hot chamber may also be utilized as temperature storage chamber and **the cold chamber** utilized as chamber for rapid temperature changing tests.

... 3 -zone design



Temperature shock test chamber VT 7012 S3



So as to employ former test results, as in the past, tests in accordance with MIL-STD 883 C, method 1010.5 are performed.

Our test system type VT 7012 S3 offers you many favourable advantages. Our positive experience gained from the 2-zone design has been integrated into this system e.g. the well-proved vertical arrangement of the test zones.



Contactless sensors ensure exact limit positions and guarantee perfect tightness between the individual zones and thus very low energy consumption.

All test zones may be operated as individual systems. The middle zone allows the preconditioning and post conditioning of specimens.

Comfortable and practicable operation ...

The control and communication system provides the highest level of operating convenience, and the bus is also already included.

A high-performance 32 bit control system provides the basis for the monitoring and control of the test systems.

The control system opens the possibility to shorten test duration considerably. The dwell time required by test regulations at the desired specified temperatures are, naturally enough, adhered to.

The control system offers three operating modes with a comfortable, self-explanatory editor:

- Normal mode
- Optimized time mode
- Economy mode

Process cycles, system states and other process diagrams can be represented as graphs thanks to self-explanatory pictograms and can be designed and operated intuitively in a manner so far not possible.

Extensive test programs can be easily and reliably created, safeguarded and reactivated.

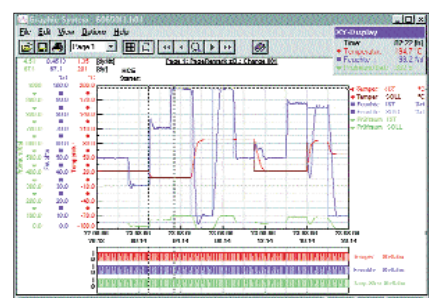
A touch is sufficient and the desired functions are actuated.

The communication link to the unit contains the basic functions emergency OFF, test specimen protection (min/max), serial and parallel interface and analogue and digital port for I/O signals.

SIMPATI*

What would a highly developed, high-performance system be without software which is clear and easy to operate, enabling you to master the flow of information. It is called SIMPATI* and determines the optional operating parameters for system and test specimens. In addition to the well-known Windows standards, the software can also be integrated into networks.

Operation of test systems becomes simple and time-saving. System operating reliability is assured, thanks to the integrated monitoring routines. Evaluation and documenting of test cycles and the integration of special measuring data guarantees an improved standard.



Standard equipment

- Highly efficient 32 bit control and monitoring system
- 8" Colour touchpanel (for VT 7030 S2 & VT 7012 S3)
- PC terminal with 12" colour touch and software **SIMCONTROL*** for comfortable operation (for VT³ 7006 S2 & VT³ 7012 S2)
- **CONTROLPAD*** for indication of actual values (only for VT³ 7006 S2 & VT³ 7012 S2)
- Temperature control using movable sensor in cradle or alternatively fixed sensor in warm or hot zone
- Digital I/O, 4 inputs/outputs
- Stored programmes
- Independent adjustable temperature limiter t_{min} / t_{max} for hot zone and cold zone (for S3 also for middle zone)
- Adjustable software temperature limiter min./max.
- Door with window in hot zone, (for S3 in the middle door)
- Test space illumination
- Hermetically sealed CFC-free refrigeration circuits
- 1 ultra-lightweight shelf incl. rails
- Entry port
- Serial interface RS 232 (for VT 7030 S2 & VT 7012 S3)
- Interfaces USB / Ethernet (for VT³ 7006 S2 & VT³ 7012 S2)
- Potential-free contact for switching-off of test specimens
- Air-cooled resp. water-cooled refrigeration unit
- Status display
- Cradle in loading position locked
- Defrosting cycles automatic and programmable
- Dwell time start programmable
- Operating our counter
- Cycle counter / total no. of cycles/remaining run time
- Mobile version (only VT³ 7006 S2)
- WKD Calibration of 2 temperature values (resp. 3 temperature values for VT³ 7012 S3)

Technical data

Temperature shock test chamber		Type	VT ³ 7006 S2	VT ³ 7012 S2	VT 7030 S2	VT 7012 S3
Test space volume		Litre	60	125	300	120
Amount of zones			2	2	2	3
Temperature range hot zone		°C	+50 to +220	+50 to +220	+50 to +220	+50 to +220
Temperature range middle zone		°C	--	--	--	-10 to +90
Temperature range cold zone		°C	-80 to +70	-80 to +70	-75 to +70	-80 to +70
Temperature deviation in time ¹⁾		K	±0.3 to ±1.0		±0.3 to ±1.0	
Temperature homogeneity relative to the set value ²⁾		K	±0.5 to ±2.0		±1.0 to ±2.0	
Calibrated values	cold zone	°C	-40	-40	-40	-40
	hot zone	°C	+125	+125	+125	+125
	middle zone	°C	--	--	--	+25
Test space dimensions	Width	mm	380	470	770	470
	Depth	mm	430	650	650	630
	Height	mm	370	410	610	400
External dimensions	Width	mm	875	970	1290	960
	Depth	mm	1970	2350	1800	2150
	Height	mm	1895	1985	2220	2130
	(...) ³⁾	mm	(2330)	(2450)	(2895)	(2625)
Machine unit	Width	mm	--	--	800	--
	Depth	mm	--	--	1920	--
	Height	mm	--	--	1920	--
Loading capacity max.		kg	20	50	100	20
Sound pressure level ⁴⁾		dB(A)	58	56	58	70
Refrigeration unit			air-cooled		water-cooled	
Control system			SIMPAC*		SIMCON/32*-NET	
Electrical connection			3/N/PE AC 400 V ± 10 %, 50 Hz			
Rated power		kW	8.5	10	30	13.5

Standards - VT³ 7006 S2 + VT³ 7012 S2 + VT 7030 S2

MIL STD 883 E, meth. 1010.7, severity of test A, B, C, D ⁵⁾, F - MIL STD 810 E, meth. 503, MIL STD 202 F, meth. 107 G - IEC 60068-2-14, test Na - BS 2011 - DIN 40046, test Na, JESD22 - A104-C

Standards - VT 7012 S3

MIL STD 883 C, meth. 1010.5, severity of test A, B, C, D, G - MIL STD 202 E, meth. 107 D

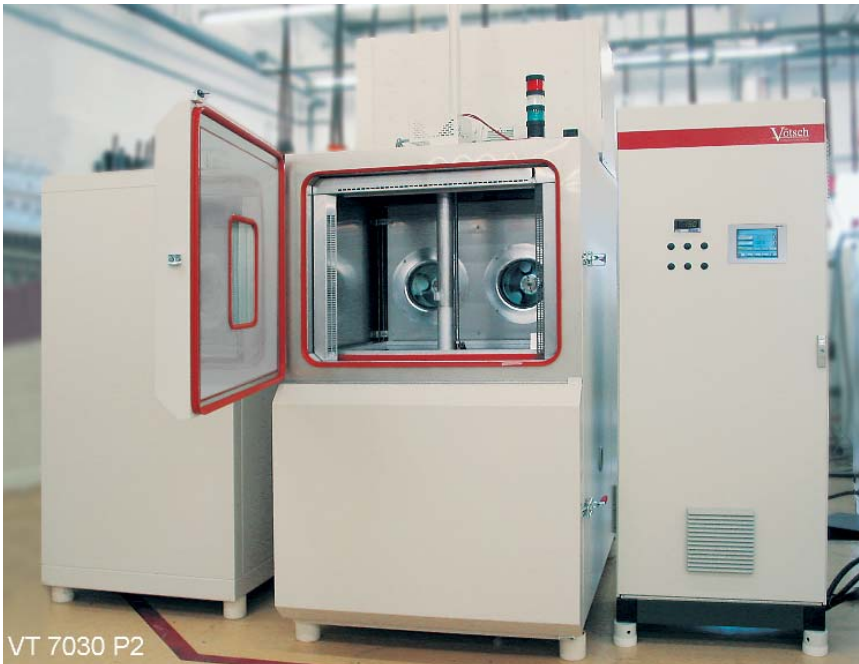
Of course as well all standards of two-chamber versions are met.

¹⁾ in middle of working space, ²⁾ for the hot zone in temperature range from +50 °C to +200 °C, for the middle zone in temperature range from -10 °C to +90 °C and for the cold zone in temperature range from -65 °C to +70 °C, ³⁾ height of installation room necessary for operation of chamber, ⁴⁾ measured in 1 m distance from the front and in 1.6 m height at free field measurement according to EN ISO 11201, ⁵⁾ only for VT³ 7006 S2 + VT³ 7012 S2

Options

- Software **SIMPATI***
- Analogue transducer I/O
- Temp. measuring on test specimen
- Temperature range extension to +250 °C (only VT³ 7006 S2 & VT³ 7012 S2)
- Interface RS 232 <--> IEEE 488 or RS 232 <--> RS 422/485
- Interface RS 422/485 (network card for test cabinet)
- Wire mesh and insert shelves
- Additional entry ports (only S2)
- Ethernet interface (only together with Option **SIMPATI*** - for VT 7030 S2 & VT 7012 S3)
- Connection for nitrogen-inertisation/compressed air dryer
- Shock cooling with LN₂
- Compressed air unit (for S3)
- Refrigeration unit water-cooled resp. external air-cooled
- European socket
- Special voltages
- WKD or DKD calibrations

Special designs ...



VT 7030 P2



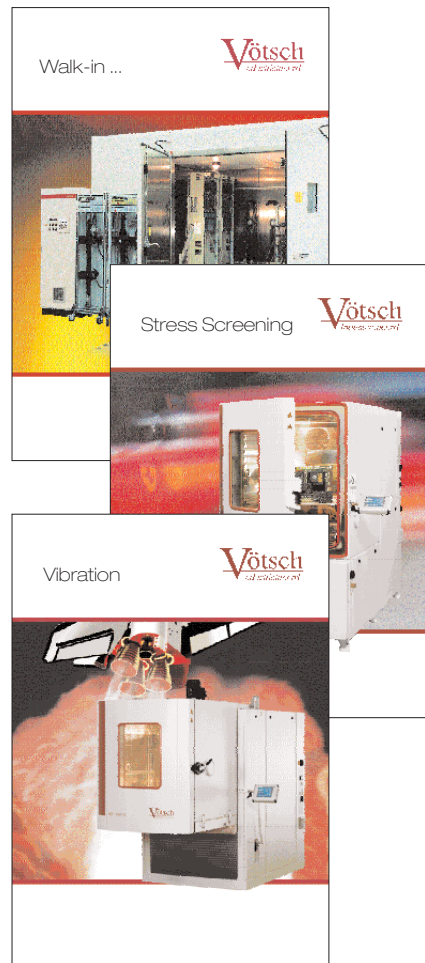
VT 7012 P2

Power-Versions VT 7030 P2 & VT 7012 P2

... efficient shock test chambers with high capability to maintain temperature stability of the specimen

We plan and manufacture tailor-made solutions to meet all requirements.

For all requirements in environmental test technology we are your partner.



We reserve the right of changes in construction resulting from technical progress.

Some of the illustrated systems contain optional extras.

Vötsch

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