Temperature Shock Test Chambers

Vötsch Industrietechnik

Systems for Extreme Temperature Cycling

Competence in temperature and climate

Vötsch was founded in Berlin in 1929 and has produced at today's location in Balingen-Frommern since 1944.
We at Vötsch develop and build test systems for quality assurance at the state-of-the-art of technology and taking the future into account.
With our products, we also take on responsibility for the safety and quality of products in many branches of industry.

Since 1995, Vötsch has been a member of the Schunk Group. Combined know-how is the basis for trendsetting developments.

Temperature Shock Test Chambers. Systems for Extreme Temperature Cycling

The application of rapid temperature cycling is the most effective manner of creating premature failures of products in the production phase. We can simulate all natural temperatures which, when considering the fields of aviation and aerospace, range between -80 °C and +220 °C.

ESS - 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.

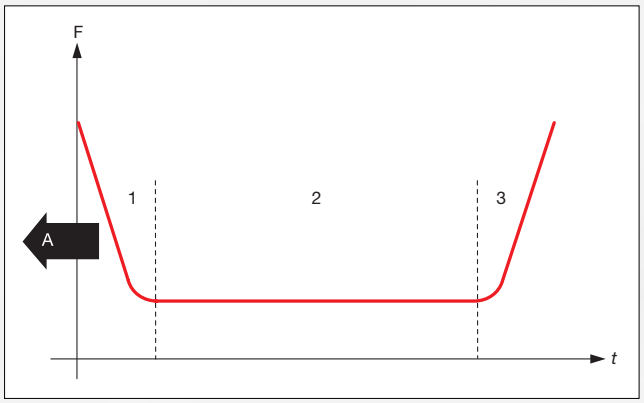
In addition to temperature stressing, extremely rapid temperature cycling rates in the range of -80 °C to +220 °C result in the extremely high mechanical stressing of test specimens. If electronic components are exposed to this severe temperature cycling, weak points are revealed rapidly.

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.

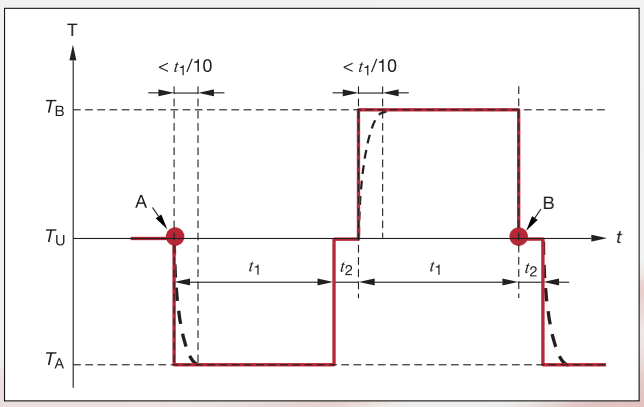
Air guidance facilities, designed according to experience gained from the field, combined with high air circulating rates result in rapid temperature cycles and a uniform distribution of temperature in the test space.

1000 cycles are possible without defrosting.



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

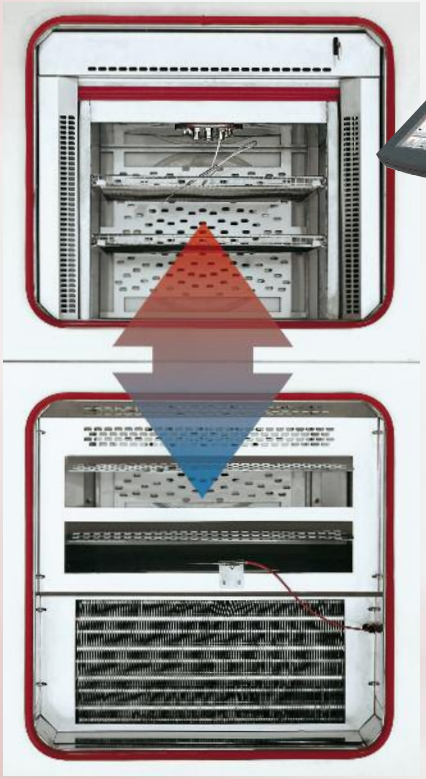


Changing temperature according IEC 60068-2-14, Test Na

T = Temperature, t = Time, T_A = Lower temperature, T_u = Ambient temperature, T_B = Upper temperature, A = Start of first cycle,
B = End of first cycle and start of second cycle, t_1 = Exposure time,
t_2 = Transfer time

Temperature Shock Test Chambers of the latest generation: VT³ 7006 / 7012 / 7030 S2

- Test space volumes 60 l, 120 l and 300 l
- Vertical arrangement of the test zones
- Ball spindle drive ensures reliable guidance of the cradle
- Cradle load 20 kg for VT³ 7006 S2, 50 kg for VT³ 7012 S2 and 100 kg for VT³ 7030 S2
- Removable guards on all sides of the cradle protect the 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
- High air circulation rate, short temperature change rates and even temperature distribution in the test space
- Volume compensation system for long-term operation integrated in the machine compartment
- Large port for the supply/ measurement of specimens
- Hot chamber may also be utilized as temperature storage chamber and cold chamber as chamber for rapid temperature changing tests
- High resolution colour touchpanel with graphical display for the easy processing of environmental simulation programs
- Minimum energy consumption
- No compressed air required



Operation sequence

Comfortable operation

The temperature shock test chambers of series VT3 7006 / 7012 / 7030 S2 are equipped standard with a 12” colour touchpanel. The 12” panel contains an industrial PC including the Windows software package for maximum user comfort.

In addition, an easily readable CONTROLPAD* is integrated into the glass panel of the door. The CONTROLPAD* allows to start and stop test cycles, and to display temperature values of hot chamber and cold chamber. With the integrated process visualisation, the device function is explained in a way that is easy to understand.

Fully developed software

With the optionally available SIMPATI* software, you have the optimal system for operation and control of the test system. The software not only permits evaluation and documentation of the test sequences, but also allows problem-free integration of the system into a PC network. Archiving of the data and parameters is always ensured with the SIMPATI* software.

Power-Versions

For extra powerful test requirements the test chamber types VT3 7012 S2 and VT3 7030 S2 are also available as Power-Versions with increased performance (types VT3 7012 P2 and VT3 7030 P2).

VT 7012 S3

VT 7012 S3 with three chambers

The VT 7012 S3, an innovative three-chamber system has been developed for demanding screening processes, which require more than two temperature chambers. All test zones may be operated as individual systems. The middle zone allows the preconditioning and post conditioning of specimens. Contactless sensors ensure exact limit positions and guarantee perfect tightness between the individual zones and thus very low energy consumption.

The VT 7012 S3 is equipped with an 8" colour touch panel (800 x 600 px).

Standard equipment

CONTROLPAD*

Colour touchpanel

- Highly efficient 32 bit control and monitoring system
- 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
- 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 programable
- Operating hour counter
- Cycle counter / total no. of cycles / remaining run time

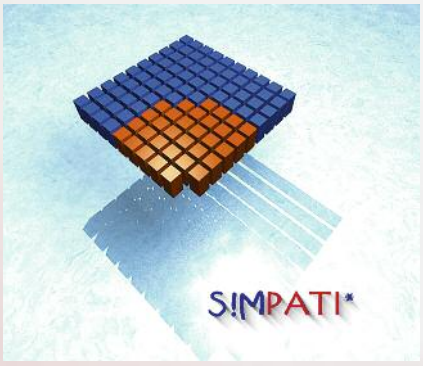
VT³ 7006 / 7012 / 7030 S2

- PC terminal with 12” colour touch and software SIMCONTROL* for comfortable operation
- CONTROLPAD* for indication of actual values
- Interfaces USB / Ethernet
- Mobile version (only VT³ 7006 S2)
- WKD Calibration of 2 temperature values

VT 7012 S3

- 8” Colour touchpanel
- Serial interface RS 232
- WKD Calibration of 2 temperature values

Options



Control software

- Software SIMPATI*
- Analogue transducer I/O
- Temperature measuring on test specimen
- 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)
- Connection for nitrogen-inertisation/compressed air dryer
- Shock cooling with LN_2
- Compressed air unit (for S3)
- Refrigeration unit water-cooled resp. external air-cooled
- European socket
- Special voltages
- WKD or DKD calibrations

VT³ 7006 / 7012 / 7030 S2

- Temperature range extension to +250 °C

VT 7012 S3

- Ethernet interface (only together with Option SIMPATI*)

Technical data

Temperature shock test chamber		Type	VT³ 7006 S2	VT³ 7012 S2	VT³ 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	-80 to +70	-80 to +70
Temperature deviation in time [1]		K	±0.3 to ±1.0		±0.3 to ±1.0	
Temperature homogeneity in space 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
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 + VT³ 7030 S2
MIL STD 883 F, meth. 1010.8, severity of test A, B, C, D [5], F - MIL STD 810 E, meth. 503 - 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 G, meth. 107. 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

We reserve the right of changes in construction resulting from technical progress. Some of the illustrated systems contain optional extras.

Environmentally conscious design

We are convinced that our environment should be burdened as little as possible. This attitude shows up in design and production with a solvent-free powder-coating, an asbestos- and CFC-free mineral-fibre insulation, chloride-free refrigerant and a guaranteed recycling system.

Environmental Simulation

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Quality without limits

DKD-K-19501
ISO/IEC 17025

We are the competent partner in environmental test technology. Besides our comprehensive standard program we plan, design and build tailor-made solutions for you in every desired version, and we do this worldwide.

You can find further information and representatives worldwide at
www.voetsch.info



VIT-E 5/15 11.11 N WD