

Thermo[®] TEC



Expertise in Environmental Test Technology

ENVIRONMENTAL SIMULATION

Expertise in Environmental Test Technology

ThermoTEC has been specialising in selling and servicing environmental test technology for more than 30 years. With innovative technology and in-depth expertise, we inspire our customers and also help you to successfully implement projects with tailor-made solutions.



Since 1991 ThermoTEC, with head office in the Central Hessian Weilburg, has looked back on steady growth. ThermoTEC In 2022 has more than 90 employees that enabled the company to realise a nationwide service organisation with close customer contact and fast service response times.

ThermoTEC is active in the following countries: Germany, Austria, Switzerland, Slovakia, Hungary and Romania, as well as in cooperation with other partner companies, in Poland and the Czech Republic.



ThermoTEC attaches great importance to close cooperation with the nearby Weilburg Technical Academy to counter the ever growing demands of the market. Internal training courses as well as external further education, such as at the Bundesfachschule Kälte-Klima-Technik (Federal College of Refrigeration and Air Conditioning Technology) in Maintal, form the cornerstone in meeting our quality standards.



The in-depth expertise of our employees is enhanced by high-quality products, such as the temperature and humidity testing chambers of ESPEC Corp. in Japan, one of the world's leading providers of environmental simulation equipment.

Test chambers from ESPEC are used in many branches of industry, such as the automotive, electronics and semiconductor sectors as well as in the aerospace industry – wherever material and function tests in reproducible environmental conditions are performed.

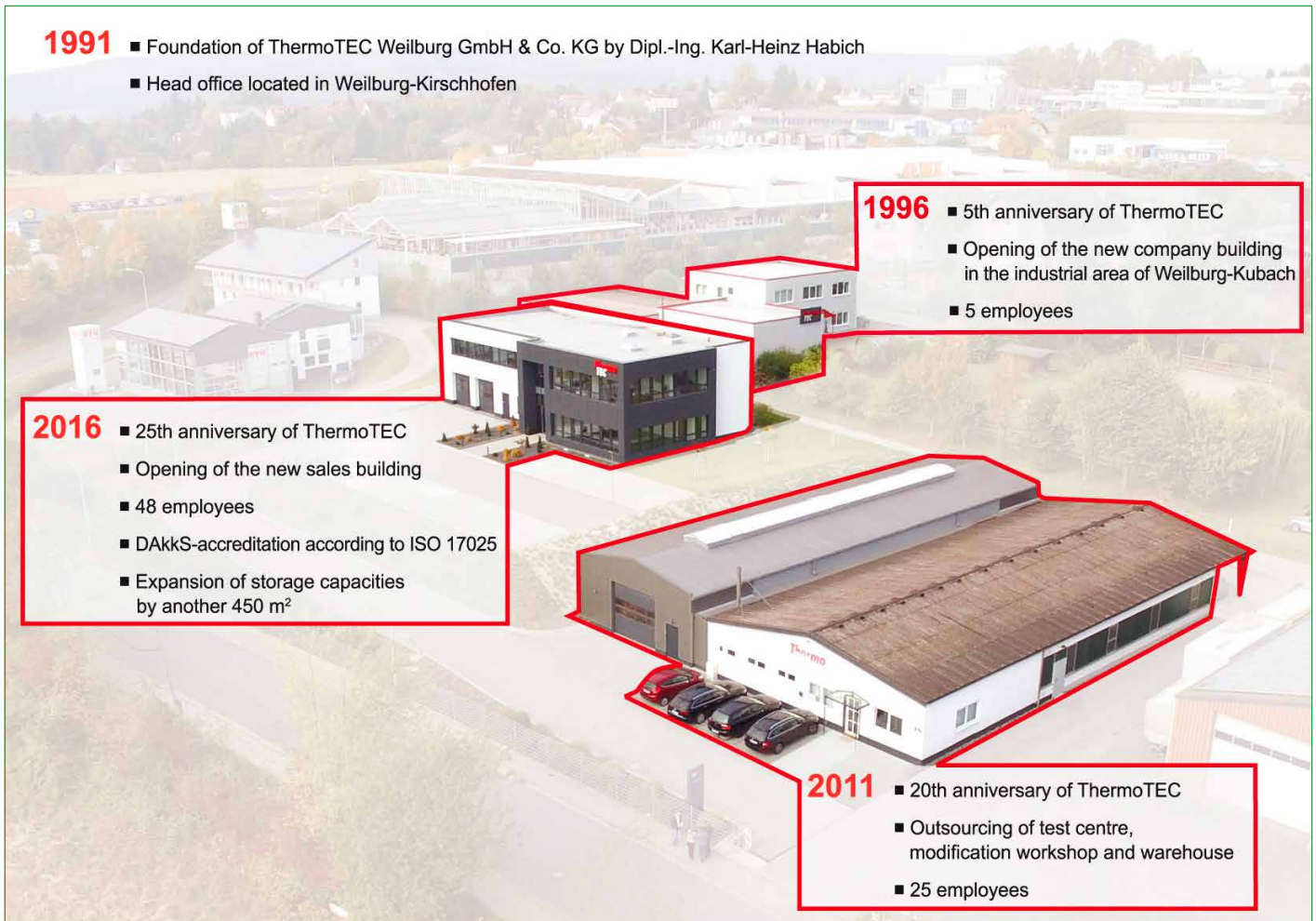


We focus on the highest quality – not only in our products. ThermoTEC has been certified in accordance with ISO 9001 since 2003.

In order to always also meet the current demands of the market as a calibration service provider, since 2015 we have maintained an accredited calibration laboratory in accordance with ISO 17025 for the physical parameters of temperature and relative humidity. This permits ThermoTEC to calibrate temperature test chambers and climate test chambers, thermal shock test chambers, ovens as well as other environmental simulation systems, independent of the manufacturer, on site.

ThermoTEC Milestones

30 Years of solid Growth



We gladly invite you to visit us at our headquarter in Weilburg an der Lahn. Here you will gain an insight into our accredited calibration laboratory, as well as the in-house test centre. Get to know our test chambers or carry out comparative measurements.

Please contact us, we look forward to your visit.

Expertise in Environmental Test Technology

Our products and services



Environmental Simulation

Temperature test chambers, temperature and humidity test chambers, thermal shock test chambers and much more for reliable product testing.

During production, storage, transport and use, a product is exposed to a number of thermal and climatic influences. They affect the properties, function and finally the lifetime of a product. Temperature and humidity test chambers simulate the environmental conditions and reliably check the product durability and safety.

ThermoTEC offers a comprehensive portfolio of temperature and humidity test chambers, thermal shock test chambers, HAST-systems, walk-in climate chambers and screening chambers, which cover all application areas of the environmental simulation.

For a detailed description of our product range for the field of environmental simulation please refer to the following pages.



Botany

Climate chambers with light and plant growth walk-in chambers for biological applications.

Growth conditions have to be simulated perfectly in biological research and production to cultivate plants and seeds and examine insects. Plant growth chambers, climate chambers with light, temperature chambers with light as well as walk-in plant growth chambers reliably simulate the global climate in a reproducible manner through individually controlled temperature, humidity and day and night cycles.

For further information on our product range for the above-mentioned areas of application please refer to our product overview "Botany".



Stability Testing

Chambers and walk-in chambers for safety in pharmaceutical production.

Pharmaceutical, chemical and cosmetic products are subject to strict safety requirements. Since improper storage and unfavorable climatic influences can, for example, cause drugs to lose their effectiveness. Stability tests are therefore mandatory for drugs and active ingredients. Among other things, the range of ThermoTEC products includes climate chambers, refrigerators, freezers, walk-in climate chambers, refrigeration and freezer cells as well as incubators specifically for stability tests according to the ICH guideline and GMP.

For further information on our product range for the above-mentioned areas of application please refer to our product overview "Stability testing".



Environmental Testing

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Temperature and Humidity Chambers

Bench-Top-series



- Temperature range
-60 °C / -40 °C to
+150 °C / +180 °C
- Available with a test area
volume of 22.5 l and 64 l
- Compact design –
optimal use of space, due
to stackability
- 230 V connection plug
- LCD color-touch-display
with program function for an
easy and user-friendly
handling
- Remote access for program-
ming and data logging via Eth-
ernet interface as a standard

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Bench-Top Type Temperature (& Humidity) Chamber SH-SU".

Temperature Chambers

| Type | Temperature range | Humidity range | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
|--------|--------------------------|----------------|-----------------|------------------------------------|-------------------------------------|
| SU-222 | -20 to +150 °C (+180 °C) | -- | 22,5 l | 300 x 300 x 250 | 440 x 625 x 696 |
| SU-242 | -40 to +150 °C (+180 °C) | -- | 22,5 l | 300 x 300 x 250 | 440 x 625 x 696 |
| SU-262 | -60 to +150 °C (+180 °C) | -- | 22,5 l | 300 x 300 x 250 | 440 x 625 x 786 |
| SU-642 | -40 to +150 °C (+180 °C) | -- | 64,0 l | 400 x 400 x 400 | 540 x 665 x 920 |
| SU-662 | -60 to +150 °C (+180 °C) | -- | 64,0 l | 400 x 400 x 400 | 540 x 665 x 920 |

Temperature and Humidity Chambers

| Type | Temperature range | Humidity range | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
|--------|--------------------------|------------------|-----------------|------------------------------------|-------------------------------------|
| SH-222 | -20 to +150 °C (+180 °C) | 30 to 95 % r. h. | 22,5 l | 300 x 300 x 250 | 440 x 690 x 696 |
| SH-242 | -40 to +150 °C (+180 °C) | 30 to 95 % r. h. | 22,5 l | 300 x 300 x 250 | 440 x 690 x 696 |
| SH-262 | -60 to +150 °C (+180 °C) | 30 to 95 % r. h. | 22,5 l | 300 x 300 x 250 | 440 x 690 x 786 |
| SH-642 | -40 to +150 °C (+180 °C) | 30 to 95 % r. h. | 64,0 l | 400 x 400 x 400 | 540 x 730 x 921 |
| SH-662 | -60 to +150 °C (+180 °C) | 30 to 95 % r. h. | 64,0 l | 400 x 400 x 400 | 540 x 730 x 921 |

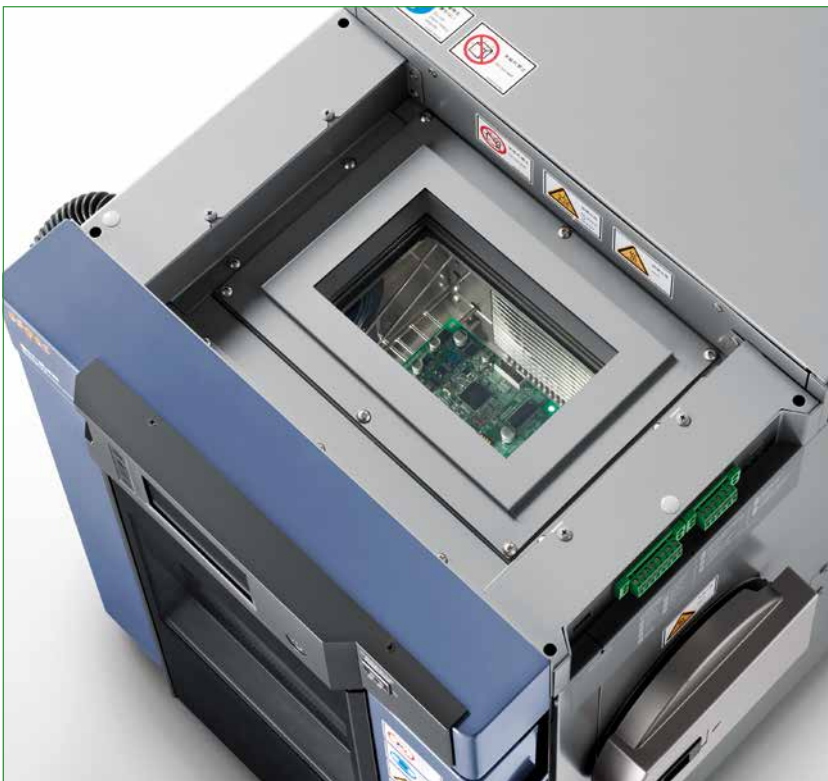


Viewing window inside the test chambers door (option)



Hand-in port in different sizes available (option)

Roof top viewing window (option)



Tensile testing machine combined with a temperature chamber, type SU



Compact Ultra Low Temperature Chambers

BTZ-series / MC-series



- BTZ-175E ■ Temperature range -70 °C to +180 °C
- BTZ-4200E ■ Temperature change rate up to 13 K/min
- Available with a test area volume of 42 l / 113 l
- Compact design
- 230 V connection plug
- Ethernet interface

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Bench-Top Test Chambers Temperature and Humidity".



- MC-712R ■ Temperature range
- MC-812R -85 °C / -75 °C to +100 °C / +180 °C
- Available with a test area volume of 64 l
- Compact design
- LCD color-touch-display with program function for an easy and user-friendly handling
- Remote access for programming and data logging via Ethernet interface as a standard
- Energy-efficient

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Compact Ultra Low Temperature Chamber MC-712R / 812R".

| Temperature Chambers | | | | | | | |
|----------------------|-------------------|----------------|-------------------------|-----------------|---------------------------------|----------------------------------|--|
| Type | Temperature range | Humidity range | Temperature change rate | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) | |
| BTZ-175E | -70 to +180 °C | -- | to 5 K/min | 42 l | 500 x 300 x 280 | 770 x 865 x 850 | |
| BTZ-4200E | -70 to +180 °C | -- | to 13 K/min | 113 l | 498 x 600 x 381 | 788 x 1880 x 1055 | |
| MC-712R | -75 to +100 °C | -- | to 7 K/min | 64 l | 400 x 400 x 400 | 900 x 1200 x 610 | |
| MC-812R | -85 to +180 °C | -- | to 5,5 K/min | 64 l | 400 x 400 x 400 | 900 x 1200 x 610 | |

Constant Temperature and Climatic Chambers

LH-/LU-series



- Temperature range -20 °C / +5 °C / RT +10 K to +85 °C
- Available with a test area volume of 105 l and 206 l
- Compact design
- LCD color-touch-display with program function for an easy and user-friendly handling
- Remote access for programming and data logging via Ethernet interface as a standard
- Energy-saving mode
- 230 V connection plug
- Low noise level

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Constant Climate Cabinet LH/LHL/LHU/LU".

| Temperature Chambers | | | | | |
|----------------------|-------------------|----------------|-----------------|---------------------------------|----------------------------------|
| Type | Temperature range | Humidity range | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
| LU-114 | -20 to +85 °C | -- | 105 l | 500 x 600 x 390 | 680 x 1090 x 826 |
| LU-124 | -20 to +85 °C | -- | 206 l | 500 x 750 x 590 | 680 x 1240 x 1026 |

| Temperature and Humidity Chambers | | | | | |
|-----------------------------------|-------------------|------------------|-----------------|---------------------------------|----------------------------------|
| Type | Temperature range | Humidity range | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
| LH-114 | RT +10 to +85 °C | 45 to 95 % r. h. | 105 l | 500 x 600 x 390 | 680 x 1090 x 826 |
| LHL-114 | +5 to +85 °C | 40 to 95 % r. h. | 105 l | 500 x 600 x 390 | 680 x 1090 x 826 |
| LHU-114 | -20 to +85 °C | 40 to 95 % r. h. | 105 l | 500 x 600 x 390 | 680 x 1090 x 826 |
| LHU-124 | -20 to +85 °C | 40 to 95 % r. h. | 206 l | 500 x 750 x 590 | 680 x 1240 x 1026 |

Laboratory Temperature and Humidity Chambers

Platinous J-series



- Temperature range -70 °C / -40 °C / -20 °C to +100 °C / +150 °C / +180 °C
- Available with a test area volume of 120 l / 225 l / 408 l and 800 l
- LCD color-touch-display with program function for an easy and user-friendly handling
- Remote access for programming and data logging via Ethernet interface as a standard
- High energy efficiency and low noise level
- Unique PHP-Model without conventional compressor. Suitable for applications with high temperature and high humidity, for example +85 °C / 85 % r. h.
- Test area and housing made of stainless steel
- Viewing window as standard (larger viewing window available on request)
- Movable design as standard
- Very homogeneous air distribution caused by cross flow fans

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Platinous J Series".

| Temperature Chambers | | | | | | | | |
|----------------------|--------------------------|----------------|-------------------------|---------|-----------------|---------------------------------|----------------------------------|--|
| Type | Temperature range | Humidity range | Temperature change rate | | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) | |
| | | | heating | cooling | | | | |
| PU-1 J | -40 to +100/+150/+180 °C | -- | 3 K/min | 2 K/min | 120 l | 500 x 600 x 400 | 910 x 1440 x 873 | |
| PU-2 J | -40 to +100/+150/+180 °C | -- | 3 K/min | 2 K/min | 225 l | 500 x 750 x 600 | 910 x 1590 x 1073 | |
| PU-3 J | -40 to +100/+150/+180 °C | -- | 3 K/min | 2 K/min | 408 l | 600 x 850 x 800 | 1010 x 1690 x 1273 | |
| PU-4 J | -40 to +100/+150/+180 °C | -- | 3 K/min | 2 K/min | 800 l | 1000 x 1000 x 800 | 1410 x 1970 x 1273 | |
| PG-2 J | -70 to +100/+150/+180 °C | -- | 5 K/min | 2 K/min | 306 l | 600 x 850 x 600 | 1010 x 1690 x 1273 | |
| PG-4 J | -70 to +100/+150/+180 °C | -- | 5 K/min | 1 K/min | 800 l | 1000 x 1000 x 800 | 1410 x 1983 x 1593 | |



Test area with two shelves



Test chamber with wide-view door (option)

Climate Chambers

| Type | Temperature range | Humidity range | Temp. change rate | | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
|--------|--------------------------|------------------|-------------------|---------|-----------------|---------------------------------|----------------------------------|
| | | | heating | cooling | | | |
| PR-1 J | -20 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 120 l | 500 x 600 x 400 | 910 x 1440 x 873 |
| PR-2 J | -20 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 225 l | 500 x 750 x 600 | 910 x 1590 x 1073 |
| PR-3 J | -20 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 408 l | 600 x 850 x 800 | 1010 x 1690 x 1273 |
| PR-4 J | -20 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 1 K/min | 800 l | 1000 x 1000 x 800 | 1410 x 1970 x 1273 |
| PL-1 J | -40 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 120 l | 500 x 600 x 400 | 910 x 1440 x 873 |
| PL-2 J | -40 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 225 l | 500 x 750 x 600 | 910 x 1590 x 1073 |
| PL-3 J | -40 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 408 l | 600 x 850 x 800 | 1010 x 1690 x 1273 |
| PL-4 J | -40 to +100/+150/+180 °C | 10 to 98 % r. h. | 3 K/min | 2 K/min | 800 l | 1000 x 1000 x 800 | 1410 x 1970 x 1273 |

Climate Chambers without Compressor for Applications, such as 85 °C / 85 % r. h.

| Type | Temperature range | Humidity range | Temp. change rate | | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
|---------|-------------------|------------------|-------------------|---------|-----------------|---------------------------------|----------------------------------|
| | | | heating | cooling | | | |
| PHP-2 J | RT +10 to +100 °C | 40 to 98 % r. h. | -- | -- | 219 l | 500 x 730 x 600 | 910 x 1590 x 1073 |
| PHP-3 J | RT +10 to +100 °C | 40 to 98 % r. h. | -- | -- | 398 l | 600 x 830 x 800 | 1010 x 1690 x 1273 |
| PHP-4 J | RT +10 to +100 °C | 40 to 98 % r. h. | -- | -- | 784 l | 1000 x 980 x 800 | 1410 x 1970 x 1273 |

Automotive Temperature and Climate Chambers

AR-series



- Temperature range -75 °C / -70 °C / -42 °C to +180 °C
- Temperature change rate from 5 K/min to 18 K/min
- Available with a test area volume from 220 l to 1760 l
- LCD color-touch-display with program function for an easy and user-friendly handling
- Remote access for programming and data logging via Ethernet interface as standard
- Test area and housing made of stainless steel
- Automatic water supply as standard
- Movable design as standard
- Flexible arrangement of cable ports at both chamber sides possible

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Environmental Stress Chamber AR series".

| Temperature Chambers | | | | | | | |
|----------------------|-------------------|----------------|-------------------------|------------|-------------------------------|---------------------------------|----------------------------------|
| Type | Temperature range | Humidity range | Temperature change rate | | Inside capacity ¹⁾ | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
| | | | heating | cooling | | | |
| ARU-0680 | -42 to +180 °C | -- | 6,3 K/min | 4,8 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 1805 |
| ARU-1100 | -42 to +180 °C | -- | 4,7 K/min | 4,4 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2005 |
| ARG-0220 | -75 to +180 °C | -- | 6,0 K/min | 5,2 K/min | 220 l | 700 x 800 x 400 | 900 x 1742 x 1455 |
| ARG-0390 | -75 to +180 °C | -- | 5,0 K/min | 4,0 K/min | 390 l | 700 x 800 x 700 | 900 x 1742 x 1705 |
| ARG-0680 | -75 to +180 °C | -- | 6,0 K/min | 4,2 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 1805 |
| ARG-0680-5 | -70 to +180 °C | -- | 6,0 K/min | 6,0 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 2255 |
| ARG-0680-15 | -70 to +180 °C | -- | 15,0 K/min | 15,0 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 2255 |
| ARG-1100 | -75 to +180 °C | -- | 4,7 K/min | 4,1 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2005 |
| ARG-1100-5 | -70 to +180 °C | -- | 6,0 K/min | 6,0 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2455 |
| ARG-1100-10 | -70 to +180 °C | -- | 10,0 K/min | 10,0 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2455 |
| ARG-1430-15 | -70 to +180 °C | -- | 15,0 K/min | 15,0 K/min | 1430 l | 1100 x 1000 x 1300 | 1300 x 1980 x 3395 |
| ARGF-0250-10 | -70 to +180 °C | -- | 10,0 K/min | 10,0 K/min | 249 l | 600 x 830 x 500 | 800 x 1703 x 1900 |
| ARGF-0250-15 | -70 to +180 °C | -- | 18,0 K/min | 18,0 K/min | 249 l | 600 x 830 x 500 | 800 x 1703 x 1900 |
| ARGF-0400-10 | -70 to +180 °C | -- | 10,0 K/min | 10,0 K/min | 398 l | 600 x 830 x 800 | 800 x 1703 x 2200 |
| ARGF-0400-15 | -70 to +180 °C | -- | 15,0 K/min | 15,0 K/min | 398 l | 600 x 830 x 800 | 800 x 1703 x 2200 |
| ARGF-0800-10 | -70 to +180 °C | -- | 10,0 K/min | 10,0 K/min | 784 l | 1000 x 980 x 800 | 1200 x 1853 x 2200 |
| ARGF-0800-15 | -70 to +180 °C | -- | 15,0 K/min | 15,0 K/min | 784 l | 1000 x 980 x 800 | 1200 x 1853 x 2200 |

¹⁾The test space can be changed in depth and height on request, up to 1,760 l usable space volume.



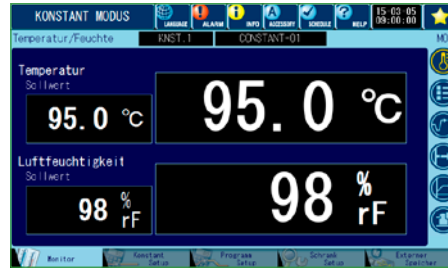
Test area with one shelf



Large water tanks (manually or automatically supplied)



Accurate measurement and control system using a psychrometer



Precise control even under demanding test conditions

Temperature Chambers

| Type | Temperature range | Humidity range | Temperature change rate | | Inside capacity ¹⁾ | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
|---------------------|-------------------|-----------------|-------------------------|------------|-------------------------------|---------------------------------|----------------------------------|
| | | | heating | cooling | | | |
| ARL-0680 | -42 to +180 °C | 10 to 98 % r.h. | 6,3 K/min | 4,8 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 1805 |
| ARL-1100 | -42 to +180 °C | 10 to 98 % r.h. | 4,7 K/min | 4,4 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2005 |
| ARS-0220 | -75 to +180 °C | 10 to 98 % r.h. | 6,0 K/min | 5,2 K/min | 220 l | 700 x 800 x 400 | 900 x 1742 x 1455 |
| ARS-0390 | -75 to +180 °C | 10 to 98 % r.h. | 5,0 K/min | 4,0 K/min | 390 l | 700 x 800 x 700 | 900 x 1742 x 1705 |
| ARS-0680 | -75 to +180 °C | 10 to 98 % r.h. | 6,0 K/min | 4,2 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 1805 |
| ARS-0680-5 | -70 to +180 °C | 10 to 98 % r.h. | 6,0 K/min | 6,0 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 2255 |
| ARS-0680-15 | -70 to +180 °C | 10 to 98 % r.h. | 15,0 K/min | 15,0 K/min | 680 l | 850 x 1000 x 800 | 1050 x 1955 x 2255 |
| ARS-1100 | -75 to +180 °C | 10 to 98 % r.h. | 4,7 K/min | 4,1 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2005 |
| ARS-1100-5 | -70 to +180 °C | 10 to 98 % r.h. | 6,0 K/min | 6,0 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2455 |
| ARS-1100-10 | -70 to +180 °C | 10 to 98 % r.h. | 10,0 K/min | 10,0 K/min | 1100 l | 1100 x 1000 x 1000 | 1300 x 1955 x 2455 |
| ARS-1430-15 | -70 to +180 °C | 10 to 98 % r.h. | 15,0 K/min | 15,0 K/min | 1430 l | 1100 x 1000 x 1300 | 1300 x 1980 x 3395 |
| ARSF-0250-10 | -70 to +180 °C | 10 to 98 % r.h. | 10,0 K/min | 10,0 K/min | 249 l | 600 x 830 x 500 | 800 x 1703 x 1900 |
| ARSF-0250-15 | -70 to +180 °C | 10 to 98 % r.h. | 18,0 K/min | 18,0 K/min | 249 l | 600 x 830 x 500 | 800 x 1703 x 1900 |
| ARSF-0400-10 | -70 to +180 °C | 10 to 98 % r.h. | 10,0 K/min | 10,0 K/min | 398 l | 600 x 830 x 800 | 800 x 1703 x 2200 |
| ARSF-0400-15 | -70 to +180 °C | 10 to 98 % r.h. | 15,0 K/min | 15,0 K/min | 398 l | 600 x 830 x 800 | 800 x 1703 x 2200 |
| ARSF-0800-10 | -70 to +180 °C | 10 to 98 % r.h. | 10,0 K/min | 10,0 K/min | 784 l | 1000 x 980 x 800 | 1200 x 1853 x 2200 |
| ARSF-0800-15 | -70 to +180 °C | 10 to 98 % r.h. | 15,0 K/min | 15,0 K/min | 784 l | 1000 x 980 x 800 | 1200 x 1853 x 2200 |

¹⁾The test space can be changed in depth and height on request, up to 1,760 l usable space volume.

Large capacity Temperature and Humidity Chambers

FDS-series

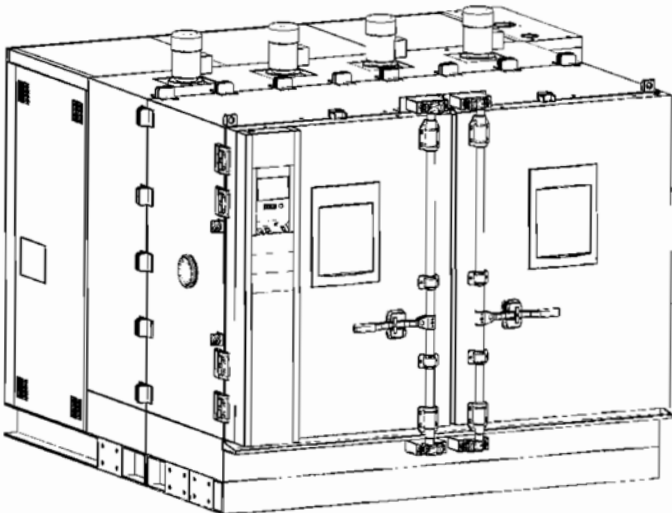
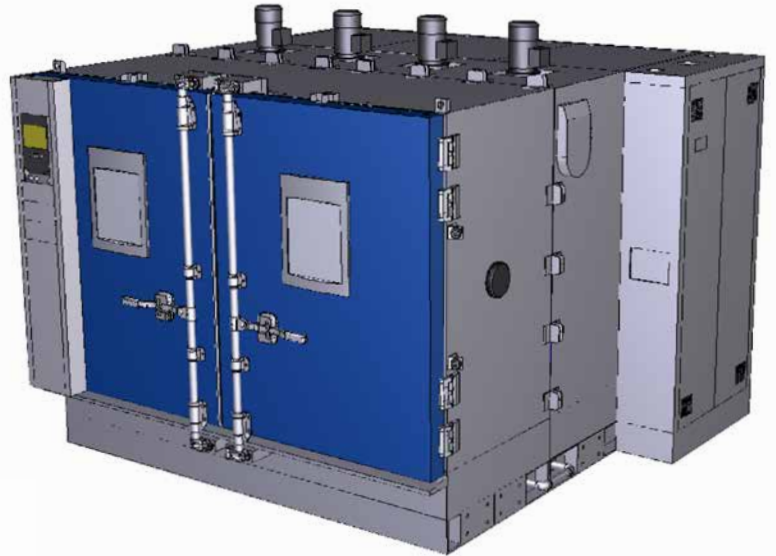


Flexible
like your applications

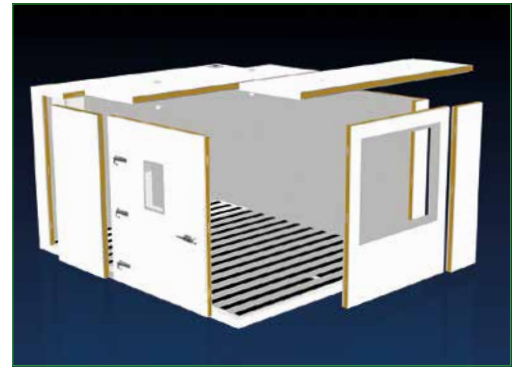
Reliable
in continuous operation

Performance
customized

- Test area volume from 1000 l to 8000 l
- Temperature range -70°C to +180°C
- Temperature change rate from 0,5 K/min to 10 K/min
- Proven technology designed according to your requirements
- High loading weight possible
- Remote access for programming and data recording via Ethernet interface in standard equipment



Walk-in Temperature and Humidity Chambers



Based on our high flexibility and our extensive experience in the field of environmental simulation we design and plan customized devices and special test systems in close cooperation with our customers, in accordance with their requirements and wishes.

- Walk-in Temperature and Humidity Chambers
- Custom-made design and size
- Performance according to customers' requirements
- Well-tried components are chosen from our engineers depending on the specific test applications
- Contact us to develop a solution appropriate for your project!

Additional information about the chambers and available options as well as the full technical data are included in our catalogues "Walk-in Type Temperature (& Humidity) Chambers E-Series" and "Walk-In Test Chambers Panelized & Solid Constructions".

HAST-Systems for accelerated Climate Testing

EHS-series



- Temperature range +50 °C / +105 °C to +142.9 °C / +162.2 °C
- Available with a test area volume of 21 l / 2 x 21 l / 51 l and 2 x 51 l
- Compact design
- Double-chamber HAST-system enables to perform two tests at the same time
- Saturated tests (pressure cooker) as well as unsaturated tests (no condensation) possible
- Contacting of specimen for active testing possible
- Forced air circulation for an homogeneous temperature and humidity distribution
- Constant- and program-mode available
- Performing of +85 °C / 85 % r. h. optional

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Highly Accelerated Stress Test System (HAST Chamber)".

| HAST-Systems | | | | | | |
|-------------------|-------------------|------------------|----------------------------------|-----------------|---|--|
| Type | Temperature range | Humidity range | Pressure range <i>(Gauge)</i> | Inside capacity | Inside dimensions <i>(Ø x D in mm)</i> | Outside dimensions <i>(W x H x D in mm)</i> |
| EHS-212 | 105 to 142,9 °C | 75 to 100% r. h. | 0,020 to 0,196 MPa | 21 l | 294 x 318 | 640 x 1483 x 850 |
| EHS-212 M | 50 to 142,9 °C | 75 to 100% r. h. | 0,020 to 0,196 MPa | 21 l | 294 x 318 | 640 x 1483 x 850 |
| EHS-212 MD | 50 to 142,9 °C | 75 to 100% r. h. | 0,020 to 0,196 MPa | 2 x 21 l | resp. 294 x 318 | 760 x 1796 x 1000 |
| EHS-222 | 105 to 142,9 °C | 75 to 100% r. h. | 0,020 to 0,196 MPa | 51 l | 394 x 426 | 740 x 1553 x 1000 |
| EHS-222 M | 50 to 142,9 °C | 75 to 100% r. h. | 0,020 to 0,196 MPa | 51 l | 394 x 426 | 740 x 1553 x 1000 |
| EHS-222 MD | 50 to 142,9 °C | 75 to 100% r. h. | 0,020 to 0,196 MPa | 2 x 51 l | resp. 394 x 426 | 860 x 1796 x 1000 |
| EHS-412 | 105 to 162,2 °C | 75 to 100% r. h. | 0,020 to 0,392 MPa | 21 l | 294 x 318 | 640 x 1483 x 850 |
| EHS-412 M | 50 to 162,2 °C | 75 to 100% r. h. | 0,020 to 0,392 MPa | 21 l | 294 x 318 | 640 x 1483 x 850 |
| EHS-412 MD | 50 to 162,2 °C | 75 to 100% r. h. | 0,020 to 0,392 MPa | 2 x 21 l | resp. 294 x 318 | 760 x 1796 x 1000 |

Individual solutions

Special applications

The use of critical media places additional requirements for the material and function of temperature and climate test chambers.

Safe system operation and long-term product reliability are the main objectives that are achieved with the aid of various (safety) components and the experience gained from experimental trials.

For standard equipment, critical media are substances that are, for example, highly corrosive, explosive, flammable or toxic. Among others, this includes the hydraulic oils often used in the automotive industry, pollutant-reducing injection media, fuels or various antifreeze mixtures.

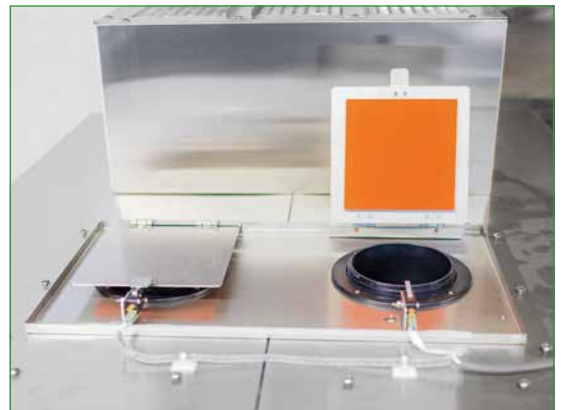
We consider it our task to advise clients accordingly on conducting risk analyses and conceptualising, as well as ultimately implementing, safety precautions derived from this process.

The detailed images that appear opposite show some of the safety components that are used in the following applications, for example:

- Applications with **hydraulic fluids**
- Applications with **brake fluids**
- Applications with **AdBlue** (diesel exhaust fluid)
- Applications with **(lithium-ion) batteries**
- Applications with **glycol**



Safety door lock



Pressure relieve ports



Fin heater with surface temperature measuring and limitation

Individual solutions

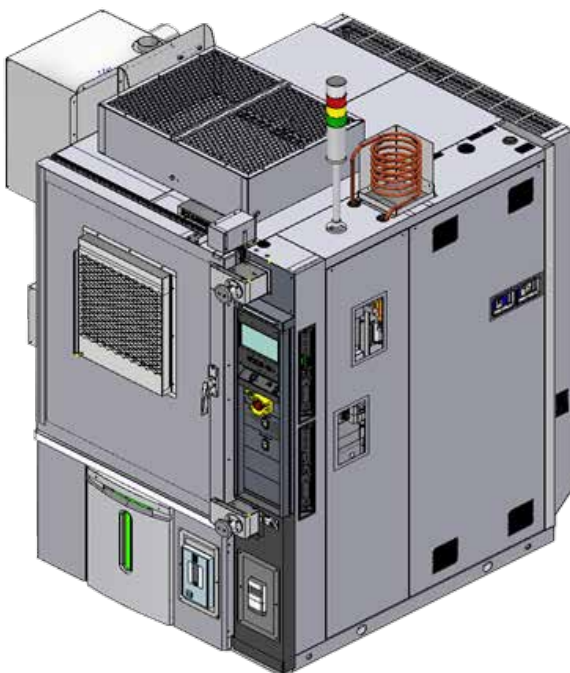
Battery testing systems

Reliable battery test systems from ESPEC for testing energy storage systems under a wide range of environmental conditions.

The ESPEC devices are particularly suitable for testing the performance of Li-ion batteries under changing temperatures as well as for storage and charge/discharge tests under precisely specified ambient temperatures.

In this way, all important performance parameters can be checked with regard to storage capacity, service life and battery performance.

- More than 20 years of experience in close cooperation with leading manufacturers and research institutions
- Safety options according to Hazard Level 0 - 6 available for all test chamber models
- Customer-oriented and customized solutions – Your ideal configuration for maximum safety
- Test chamber models can be easily integrated into external battery management systems, for example for the simulation of charging and discharging processes, and controlled via them
- Highest quality and reliability for reproducible conditions



Test chamber with various safety devices for applications with batteries

Regardless of whether cell, module or battery pack test – the Safety options can be individually configured for different sizes.

Individual solutions

Customer-specific modifications

In addition to the showroom, test centre, DAkkS-accredited calibration laboratory and spare parts warehouse, we also operate a separate workshop at the ThermoTEC headquarters in Weilburg. Here, our experienced and qualified technicians modify our standard test chambers according to individual customer requirements. In addition, we can also work together with you to develop and implement custom designs.

We have already implemented the following modifications to the satisfaction of our customers:

- Installation of various drying units, also for small-volume climatic test chambers
- Equipment with various irradiation units (for tests according to DIN 75220)
- Equipment with heavy-duty telescopic extensions
- Equipment with safety institutions for battery testing
- Modification for the temperature control of external testing boxes
- Test chamber extension
- Explosion-proof temperature test chamber



Temperature chamber according to ATEX Zone 2



Temperature control of an external box (connected to a standard temperature chamber)



Individual solutions

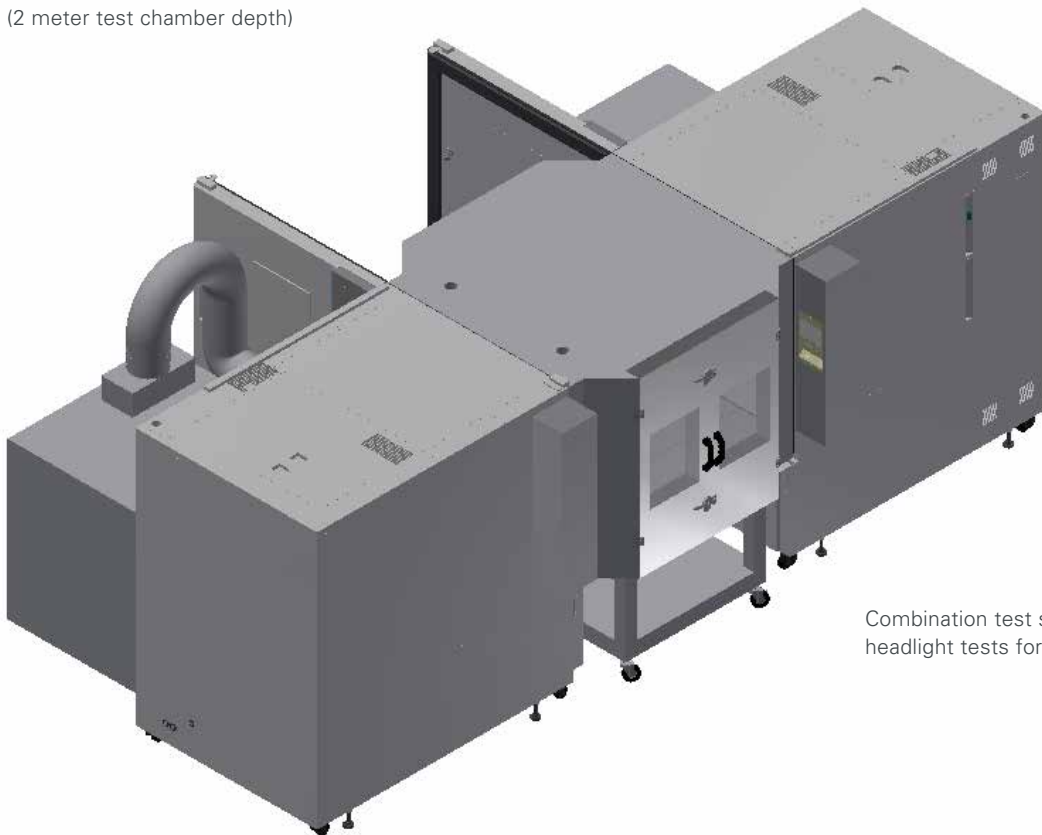
Customer-specific modifications



AR series test chamber
with test chamber extension
(2 meter test chamber depth)



Example of an
external test box



Combination test stand
headlight tests for example



800-liter climatic test chamber with sun simulators, suitable for tests according to DIN 75220



Stainless steel pull-outs for user-friendly loading of the test chamber



Customized ports



Customized design in 3D model



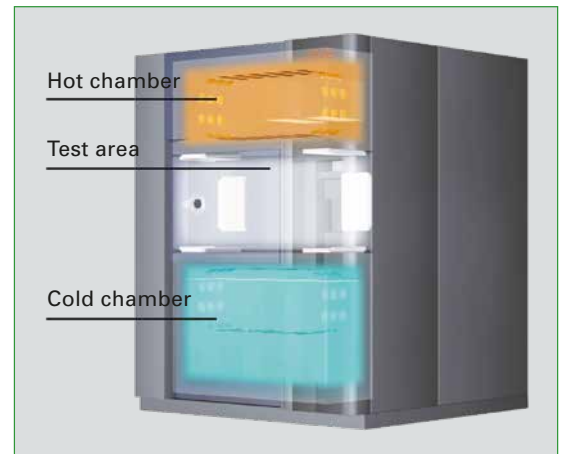
Tumble tester with rotating shaft

Thermal Shock Chambers with fixed Test Area

TSA-series

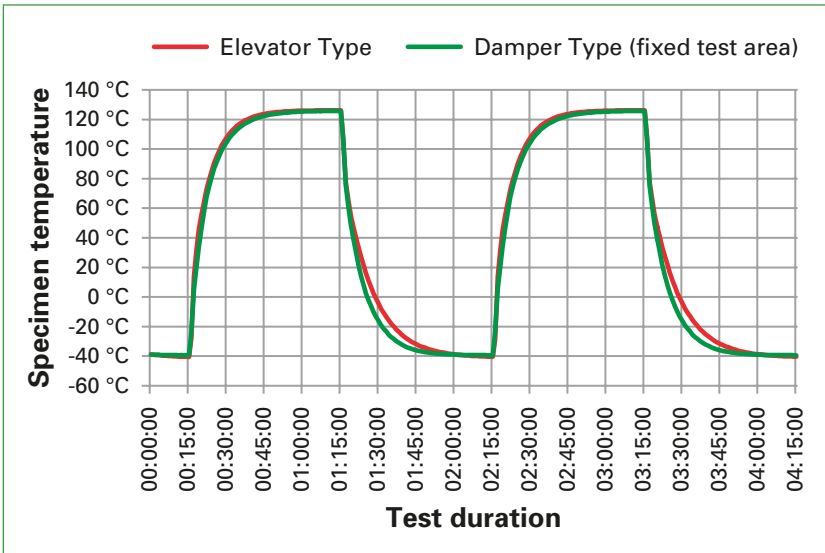


- Temperature range -70 °C / -65 °C to +200 °C (+300 °C)
- Available with a test area volume of 40 l / 70 l / 110 l / 200 l and 300 l, 600 l and 1650 l (further sizes on request)
- Performing of 2- and 3-zone-shock-tests possible
- High energy efficiency due to ECO mode
- LCD color-touch-display with program function for an easy and user-friendly handling
- Remote access for programming and data logging via Ethernet interface as standard
- Cable ports on the left chamber side – enable an user-friendly wiring
- Cable ports up to 65 x 125 mm available
- No mechanical movement and vibration affecting the DUT
- Appropriate for large and heavy products
- Chamber door opens downwards
- Low noise level
- Very maintenance friendly
- Movable design as standard
- Appropriate for tests according to IEC 60068-2-14 Na for example



TSA two-zone test

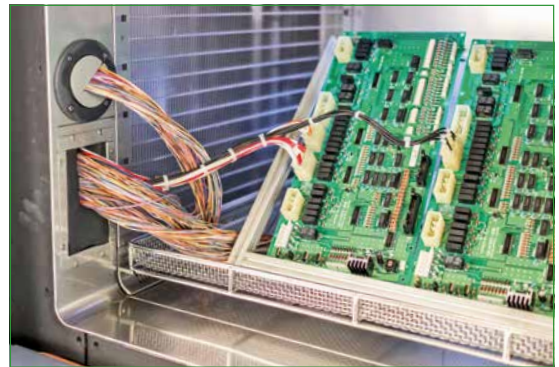
Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Air to air Thermal Shock Chambers TSA Series".



Comparison between damper type and conventional elevator type thermal shock chambers. Both chamber types have a 100 liters test area loaded with 5 kg metallic parts. The shown temperature graphs have been measured on the products surface.



Vertical doorway for a space-saving installation



Easy contacting from the side with cable port e. g. 65 x 125 mm

| Thermal Shock Chambers | | | | | |
|------------------------|--------------------------------|-----------------|-------------------------------|---------------------------------|----------------------------------|
| Type | High temperature ¹⁾ | Low temperature | Inside capacity ²⁾ | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) |
| TSA-43 EL-A | RT+50 to +200 °C | -65 to 0 °C | 40 l | 240 x 460 x 370 | 1140 x 1900 x 1270 |
| TSA-73 EL-A | RT+50 to +200 °C | -65 to 0 °C | 70 l | 410 x 460 x 370 | 1310 x 1900 x 1470 |
| TSA-73 ES-A | +60 to +200 °C | -70 to 0 °C | 70 l | 410 x 460 x 370 | 1310 x 1900 x 1470 |
| TSA-73 ES-W | +60 to +200 °C | -70 to 0 °C | 70 l | 410 x 460 x 370 | 1310 x 1900 x 1470 |
| TSA-73 EH-W | +60 to +200 °C | -70 to 0 °C | 70 l | 410 x 460 x 370 | 1310 x 1900 x 1770 |
| TSA-103 EL-A | RT+50 to +200 °C | -65 to 0 °C | 110 l | 650 x 460 x 370 | 1550 x 1900 x 1470 |
| TSA-103 ES-W | +60 to +200 °C | -70 to 0 °C | 110 l | 650 x 460 x 370 | 1550 x 1900 x 1470 |
| TSA-203 EL-W | RT+50 to +200 °C | -65 to 0 °C | 200 l | 650 x 460 x 670 | 1550 x 1900 x 1770 |
| TSA-203 ES-W | +60 to +200 °C | -70 to 0 °C | 200 l | 650 x 460 x 670 | 1550 x 1900 x 1770 |
| TSA-303 EL-W | RT+50 to +200 °C | -65 to 0 °C | 300 l | 970 x 460 x 670 | 1870 x 1900 x 1770 |
| TSA-403 EL-W | RT+50 to +200 °C | -65 to 0 °C | 390 l | 970 x 600 x 670 | 1870 x 2040 x 1770 |
| TSA-603 EL-W | RT+65 to +150 °C | -50 to 0 °C | 600 l | 1200 x 670 x 750 | 2100 x 2215 x 1892 |
| TSA-1650 H-W | +60 to +180 °C | -65 to -10 °C | 1650 l | 1500 x 1100 x 1000 | 2620 x 1990 x 2972 |

¹⁾Temperature range up to +300 °C possible on request

²⁾Test chamber volume up to 11,000 l possible, see also following page

Thermal Shock Chambers with fixed Test Area

TSA-series



Temperature shock test chamber up to 11,000 l



Customized ports in the door

Thermal Shock Chambers – Elevator Type

TSD-series and TSE-series



- Temperature range -77 °C / -65 °C to +200 °C / +220 °C / +300 °C
- Available with a test chamber volume of 100 l respectively 11 l and 22 l
- Remote access for programming and data logging via Ethernet interface as standard
- LCD color-touch-display with program function for an easy and user-friendly handling
- Cable port on the right chamber side enables an user-friendly wiring (TSD available on both sides)
- Low vibration level during elevator movement
- Less thermal stress on the spindle drive due to the placement outside of the test area
- Movable design as standard
- Low noise level
- 2 product sensors as standard
- Appropriate for tests according to IEC 60068-2-14 Na for example



Additional Information about the chambers and available options as well as the full technical data are included in our catalogue "Thermal Shock Chamber TSD-101-W / TSE-12-A"

| Thermal Shock Chambers | | | | | | |
|--------------------------|----------------------------------|--------------------------------|-----------------|---------------------------------|----------------------------------|--|
| Type | High temperature exposure range* | Low temperature exposure range | Inside capacity | Inside dimensions (WxHxD in mm) | Outside dimensions (WxHxD in mm) | |
| TSE-12-A | +60 to +200 °C | -65 to 0 °C | 11 l | 320 x 148 x 230 | 680 x 1745 x 1050 | |
| TSE-12-A enlarged | +60 to +200 °C | -65 to 0 °C | 22 l | 320 x 300 x 230 | 680 x 1775 x 1050 | |
| TSD-101 W | +60 to +205 °C | -77 to 0 °C | 100 l | 710 x 345 x 410 | 1100 x 1885 x 1965 | |

* extended high temperature exposure range up to +300 °C on request

Thermal Shock Chambers – Liquid-to-Liquid

TSB-series



- Temperature range -65 °C to +200 °C
- Available with a test area volume of 40 l and 55 l
- LCD color-touch-display with program function for an easy and user-friendly handling
- Remote access for programming and data logging via Ethernet interface as a standard
- Pneumatic driven specimen basket
- Movable design as standard
- Low noise level
- 1000 cycles +150 °C / -65 °C without the need to refill the Golden-liquid
- Appropriate for tests according to IEC 60068-2-14 Nc for example

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Liquid to liquid Thermal Shock Chamber TSB-21 / TSB-51".



| Thermal Shock Chambers | | | | | |
|------------------------|------------------------------|------------------------------|--------------|---------------------------------------|--|
| Type | Temperature range warm bath: | Temperature range cold bath: | Bath volume | Size of specimen basket (WxHxD in mm) | |
| TSB-22 | +70 to +200 °C | -65 to 0 °C | approx. 40 l | 120 x 150 x 120 | |
| TSB-52 | +70 to +200 °C | -65 to 0 °C | approx. 55 l | 150 x 150 x 200 | |

Temperature Shock Test Chambers Diving according to LV.

EWS-series

- Flushing (flooding of a fixed test tank with saline or fully demineralized (deionized) ice water
- Temperature control of the surrounding test area with circulating air
- Siemens S7 control and 7" color touch panel
- Integrated PID control for temperature
- Recording and graphical display of the temperature curve
- Plain text display of the fault message



- 1) Program control with color touch panel
- 2) Fixed test chamber
- 3) Door notch and
- 4) Cable ports for easy test item contacting
- 5) Four freely movable temperature sensors for test sample monitoring
- 6) Air- or water-cooled cooling unit
- 7) Salt water resistant feed pump up to 5 sec. flooding time

Ice water shock chambers (air-to-liquid)

| Type | Circulating air temperature Water bath temperature | Outside dimensions ¹⁾ (WxHxD in mm) | Water bath volume | Test room dimensions ¹⁾ (WxHxD in mm) |
|----------------|---|---|-------------------|---|
| EWS-2-L | +60°C to +180°C 0°C to +10°C | 1100 x 2100 x 2250 | 105 l | 500 x 150 x 500 |

Salt water shock chambers (liquid-to-liquid)

| Type | Temperature range warm bath: | Temperature range cold bath: | Bath volume | Outside dimensions (WxHxD in mm) |
|---------------------------------|---------------------------------|---------------------------------|-------------|-------------------------------------|
| L2L (customized chamber) | +40°C to +90°C | 0°C to 15°C | 150 l | 1850 x 2085 x 1750 |

¹⁾other sizes possible on request

Evaluation Systems

AMI

Ion Migration Evaluation System



The ESPEC AMI-system measures a change of the specimens insulation resistance due to dendritic growth and migration of ions. The measurements are made on the surface (SIR) or between the layers (CAF).

The AMI-system simulates test profiles with individual stress- and measurement-voltages between 1 V and 2500 V. The documentation and analysis is done via software installed on a separate PC that is connected to a multiplexer.

- Stable and uninterruptible test and measurement voltage of up to 2500 V Wide measurement range from 2×10^3 up to 1×10^{14} Ohm
- Real-time measurement of insulation resistance, temperature and humidity Continuous measurement with sampling rates of up to 100 μ S
- Real-time fault detection: detection of ion migration in the μ S range by leakage current monitoring including single channel shutdown (shutdown can be immediate or at a later time depending on the set test parameters)
- Separate power supply for each channel / from 1000V for 5 channels (thus no influence of individual measuring channels among each other)
- Constant current source to avoid high currents in case of short circuits
- A measurement with up to 300 measuring channels is possible
- The measurement is performed with high accuracy and efficiency
- Alarm / fault monitoring of the connected test chamber via the measuring system
- Simultaneous control of up to 4 ESPEC devices possible
- Data processing also possible during the test
- Extensive evaluation software is included
- Network capability

Additional information about the chambers and available options as well as the full technical data are included in our catalogue

AMR

Conductor Resistance Evaluation System



The ESPEC AMR-system monitors the transition resistances during temperature changes.

Operators are able to create test profiles that are synchronous to the temperature cycling of a thermal shock test chamber.

The system detects microcracks at connections. These microcracks often occur only temporary during thermal changes and are difficult to detect afterwards.

- Real-time measurement of resistance and temperature (continuous measurement with high accuracy)
- Large measuring range from 1×10^{-3} to $1 \times 10^6 \Omega$
- Up to 280 measurement channels available
- Available as DC or AC version
- Simultaneous control of 3 ESPEC chambers
- Data processing during test run (network-compatible)
- Monitoring of alarms and failures of the test chamber

Additional information about the chambers and available options as well as the full technical data are included in our catalogue "Conductor Resistance Evaluation System AMR".

Software

Web Manager and Online Converter

- Already included as standard in the Platinous, AR-, Bench-Top-, LH-, TSA-, TSD-, TSE-, EHS- and FDS-series
- Free Lab-View drivers available
- Connection via Ethernet interface for easy integration into your network
- Remote control, programming and data recording via PC (included free of charge)
- International standards already available as ready-to-use program for free download
- Notifications via E-Mail in cases alarms or failures occur

PGM NAME PGM_# TOTAL LIST PLOT

MEMO PRINT SAVE QUIT

LIST EDITOR

| STEP | SP | | | | RAMP | | | | DETAILS | | | | | | | | |
|------|------|------|---------|-----|--------|--------|------|-----|---------|-------|---------|-----|-------|-------|---------|-----|----|
| | TEMP | HUM | TIME | PTC | UP DEV | LO DEV | TEMP | HUM | SOAK | PAUSE | AIRFLOW | REF | W HTR | DEHUM | AUX HUM | DRN | TS |
| 1 | 23.0 | NONE | 0002 00 | | | | OFF | ON | OFF | OFF | | | | | | | |
| 2 | 85.0 | 50 | 0001 00 | | | | ON | OFF | OFF | OFF | | | | | | | |
| 3 | 85.0 | 85 | 0001 00 | | | | OFF | ON | OFF | OFF | | | | | | | |
| 4 | 85.0 | 85 | 0002 00 | | | | ON | OFF | OFF | OFF | | | | | | | |
| 5 | 85.0 | 50 | 0001 00 | | | | ON | ON | OFF | OFF | | | | | | | |
| 6 | 20.0 | 50 | 0001 00 | | | | ON | OFF | OFF | OFF | | | | | | | |
| 7 | 20.0 | NONE | 0001 30 | | | | ON | OFF | OFF | OFF | | | | | | | |

PROGRAM START: TEMP[C] OFF 0.0, HUM[%h] OFF 0

PROGRAM END: END MODE HOLD, PGM_# 1, CONST_# 1

COUNTER: CNTR A 1 X, CNTR B 0 X

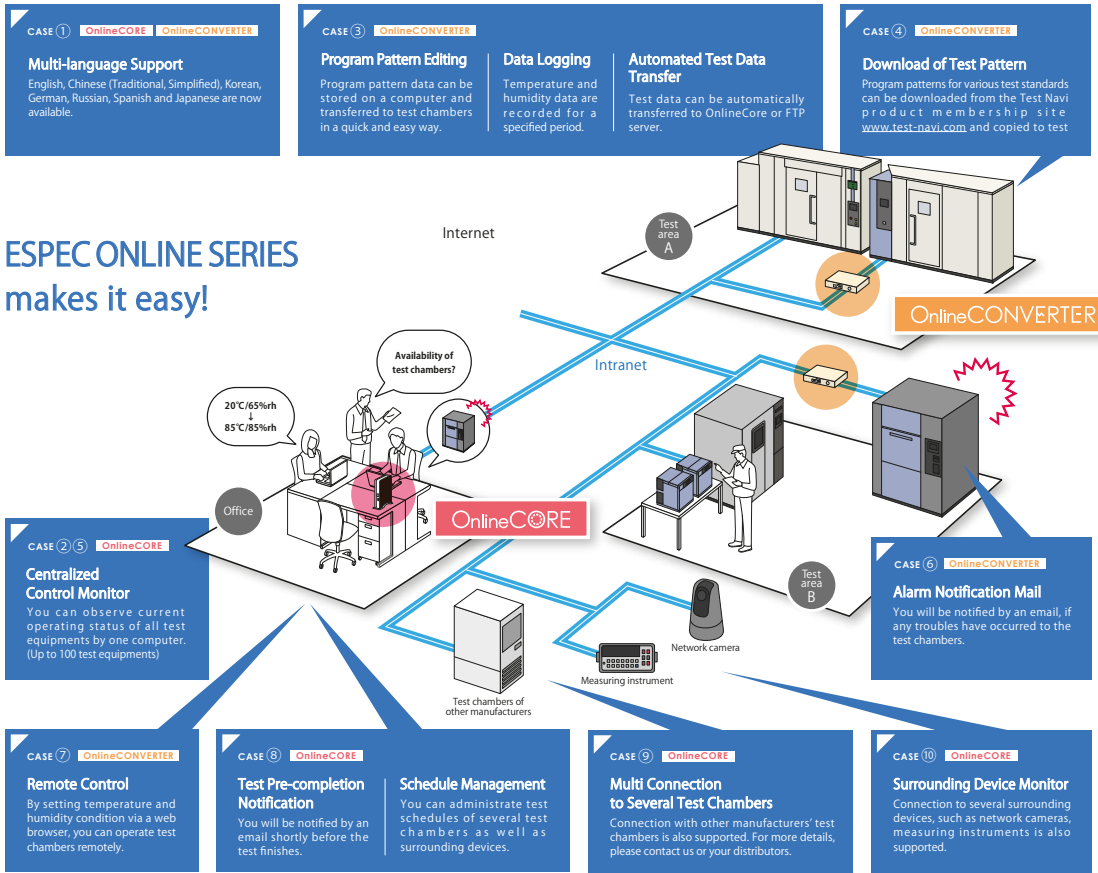
SET ABS ALM: TEMP L_LMT -50.0, H_LMT 110.0; HUM L_LMT 0, H_LMT 100

SET DEV ALM: TEMP L_LMT, H_LMT 10.0; HUM L_LMT, H_LMT

SIMULATION GRAPH

TEMP AXIS[C] to OK Navigation icons

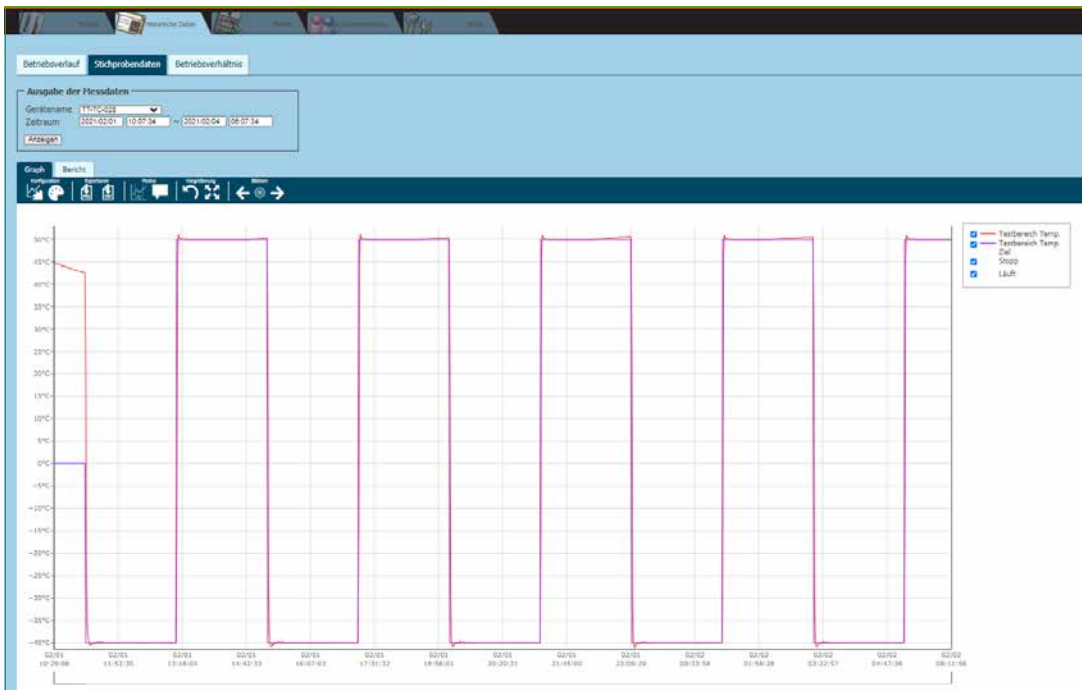
Online Core



ESPEC ONLINE SERIES makes it easy!

- Connection of up to 100 devices simultaneously possible
- Individual laboratory interface designable
- No individual licenses necessary
- Redundant auto-save function on separate drive or server
- Clear presentation by arranging the systems in your lab-layout and creatign different labs
- Monitoring of operating modes through color assignment
- Display of actual test parameters (temperature, humidity)
- Real-time reporting
- Comment function
- Calculation of rampen speed
- Storage function as image
- Planning via calendar function
- Automatic storage on company server

Additional information, options and the complete technical data can be found in our catalogue "Network Solutions".



ThermoTEC at a Glance



Distribution of chambers for environmental simulation

Since 1991 ThermoTEC has been specialising in selling and servicing temperature and humidity test chambers, thermal shock test chambers, HAST-systems, walk-in chambers as well as other systems for environmental simulation.

Starting with the very first contact, our experienced specialists are there for you. After all, apart from our sophisticated technology, our experience is our most important asset.

Stock chambers and equipment for hire

Over 150 standard temperature, climate and thermal shock test chambers are available in our Weilburg warehouse within 2 weeks.

We are happy to support you on a project-specific basis with our extensive rental concept. Simply contact us for further information or the preparation of an offer.

We offer the following services:

■ Commissioning and instructions

Support in installing the device, connecting it to the on-site media, introduction on how the devices function and how to operate and program the controller.

■ Maintenance

Regular functional inspections and cleaning of your equipment to maintain its value and ensure economic operation.

■ Qualifications

IQ, OQ, PQ, door open test, power failure and recovery test. The scope of the qualification is realised in consultation with you.





Calibrations

The calibration laboratory of ThermoTEC Weilburg GmbH & Co. KG has been accredited since 2015 by the German Accreditation Body (DAkkS) acc. to DIN EN ISO IEC 17025-2005 for the measurement parameters of temperature and humidity as well as for on-site calibrations.

To ensure the accuracy and validity of test results, measuring and test equipment as well as testing facilities must be calibrated regularly. Through our calibration procedure accredited in accordance with ISO 17025, safe and traceable measurements are obtained for your measurement and test equipment. The latest reference devices and devices for temperature generation and climate generation ensure minimum measurement uncertainties.

Our services

- Accredited for the measurement parameters of temperature and humidity
- Calibration of temperature and climate chambers in accordance with the DAkkS-DKD-R 5-7 directive on site acc. to methods A, B and C
- Calibration of direct reading temperature and humidity measuring instruments in the calibration laboratory accredited in accordance with ISO 17025
- You will receive a DAkkS calibration certificate
- Direct adjustment possible on the device

Product training

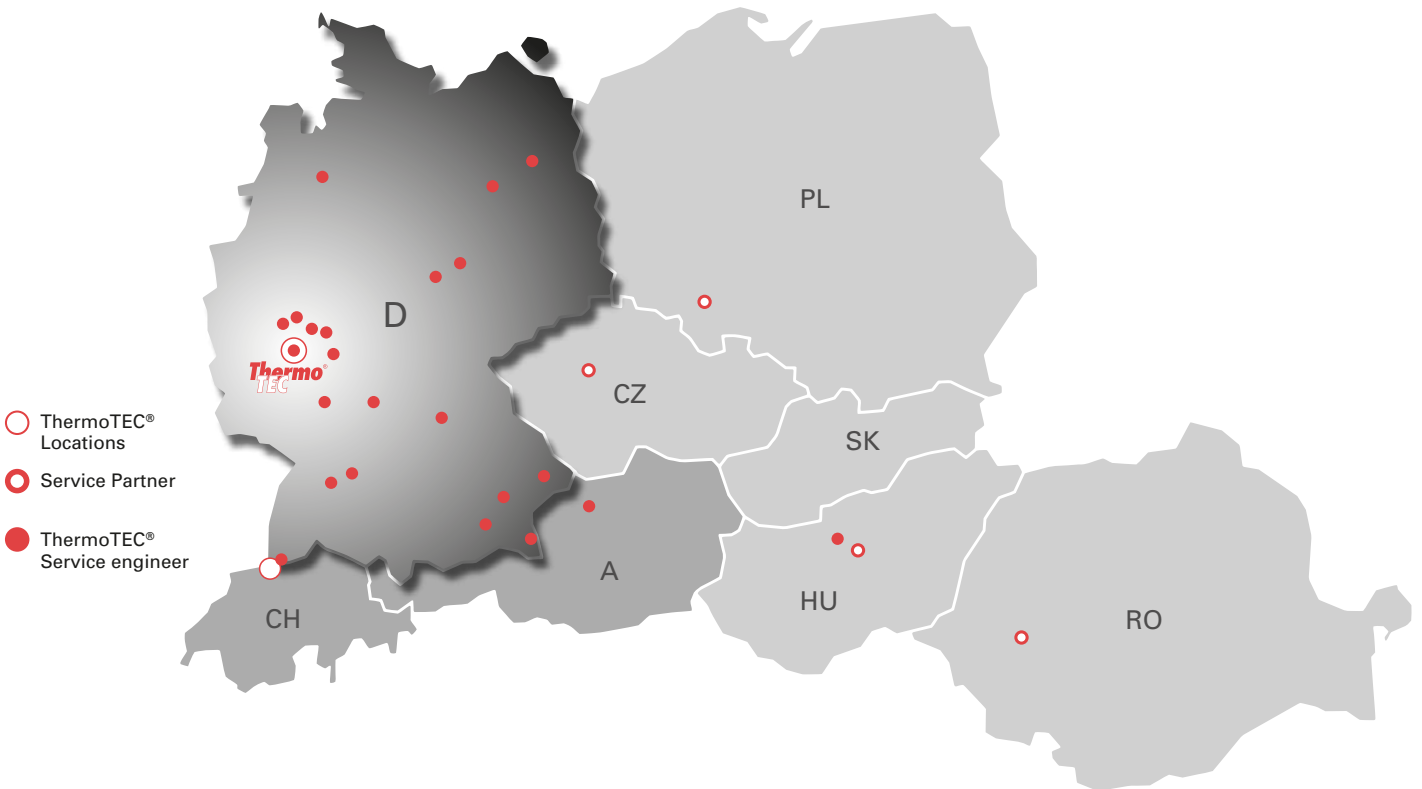
Of course, we also offer training courses for the personnel using our chambers. Our experienced technicians give you an understanding of the equipment functions and properties, explain the controller and are available for questions concerning use and for exchanging experiences.

We will also be happy to prepare an individual training concept with you that is tailored to your requirements for practical training at your company.



Our services

Nationwide service-net



Our service centre with its large spare parts warehouse is located in Weilburg in the middle of Germany. Our technicians are stationed here as well as at various other locations throughout Germany. This ensures short travel distances and times, as well as short response times to service calls, and an outstanding spare parts supply.

Our service support is available by telephone during the usual opening hours and also on weekends. In addition, there is the possibility to conclude a 24-hour service.

Our Locations



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info@climatec.hu
www.climatec.hu

Our Partner ESPEC Corporation

ESPEC is one of the leading international manufacturers in the field of environmental test cabinets and chambers that support the advancement of state-of-the-art technologies.

Founded in 1947, the company is headquartered in Osaka, Japan, and employs approximately 1,500 people in 45 countries worldwide.

As a technology leader, ESPEC offers complete solutions for environmental testing as well as customized services and attaches great importance to the continuous development and consistently high quality and reliability of its test chambers.



ESPEC production site in Japan





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