

Automated Thermal Stress System



THERMOTRON

Versatile Multiple-Use Chamber

Thermotron's ATSS-30 is a versatile chamber designed to accelerate Thermal Stress Testing. The ATSS-30 facilitates extremely rapid product temperature change rate performance in a space-saving, self-contained design – maximizing throughput while minimizing footprint. Set-point margining software optimizes product temperature recovery performance via controlled temperature offset. The ATSS-30 meets the latest MIL-STD 883E & 202F thermal shock specs as well as IEC, JEDEC, and IPC test methods. Rapid thermal shocking, accelerated product stressing, and controlled thermal cycling are all possible with this chamber. The ATSS-30 meets the demanding test needs of many industries such as: Automotive, Military, Aerospace, Electronics, Telecommunications, and Computers & Peripherals.

Airflow Designed to Meet the Test

High volume airflow is delivered to each zone via powerful circulator motors and blower wheels. Finned cooling coils in both zones draw the airflow directly over the area occupied by the product under test. Intensely washing the product with conditioned air results in very rapid product temperature recovery upon transfer. This airflow configuration is ideal for meeting 15-minute product temperature recovery specifications required by current thermal shock standards. This distribution also provides excellent control, tight gradients, and repeatability required by a thermal stress testing system.

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Two-Zone Multi-Purpose Test Chamber

Bi-Directional Zone Control

Bi-directional cooling and heating is incorporated in both the hot and cold zones. This feature allows air temperature overshoots or offsets to be closely controlled in an effort to maximize product temperature change rates or recovery. Heating in the cold zone provides an efficient means for automatic defrost. It also allows this portion of the chamber to be used as a conventional thermal cycling chamber.

Convenient Product Loading Offers Performance and Throughput Advantages

The convenient “door-within-a-door” design provides access to the hot zone without disturbing the conditions in the cold zone. Test articles in the hot zone can be cooled back down to ambient conditions and unloaded. Reloading the next batch of test articles and resuming the heat cycle will limit the build-up of moisture and frost during cold zone transfers.



Retractable Transfer Mechanism: Efficient and Safe

The patent-pending retractable transfer mechanism makes full use of the available working volume in each zone. This feature increases product loading and throughput potential while reducing overall height requirements. The transfer carrier basket is designed to withstand rigorous temperature changes, yet be as light as possible to minimize thermal loading restraints. Safety interlocks are built-in to detect transfer basket jams and to prevent the doors from being opened during transfer.

ATSS-30 PERFORMANCE SPECIFICATIONS

Temperature Range

Cold Zone	-73°C to 180°C (-100°F to 356°F)
Hot Zone	25°C to 215°C (77°F to 419°F)

Temperature Control Tolerance	±1°C (±2°F)
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Maximum Weight Capacity In Basket	20 lbs (9.1 kg)
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Transfer Time Between Zones	Approximately 8 seconds
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Noise level at 1 meter in front of unit	75 dBA
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Cooling Change Rate

Product Temperature	
125°C to -55°C	12°C/min with 9 lbs (4 kg) ICs
85°C to -40°C	25°C/min with 7 lbs (3 kg) ICs
Air Temperature	
125°C to -55°C	25°C/min with empty chamber
85°C to -40°C	35°C/min with empty chamber

Heating Change Rate

Product Temperature	
-55°C to 125°C	18°C/min with 9 lbs (4 kg) ICs
-40°C to 85°C	30°C/min with 7 lbs (3 kg) ICs
Air Temperature	
-55°C to 125°C	40°C/min with empty chamber
-40°C to 85°C	40°C/min with empty chamber

Performance to Mil Std 883E, section 1010.7, Test Condition A	13 lbs (6 kgs) ICs
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Performance to Mil Std 883E, section 1010.7, Test Condition B	9 lbs (4 kgs) ICs
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Performance to Mil Std 883E, section 1010.7, Test Condition C	2 lbs (1 kg) ICs
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Performance to Mil Std 883E, section 1010.7, Test Condition D and F	Attainable only with liquid nitrogen boost
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Transfer Basket Size	12" W x 14" D x 12" H (30 cm x 35 cm x 30 cm)
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Actual Test Zone Size	18" W x 23" D x 13" H (45 cm x 58 cm x 33 cm)
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Exterior Dimensions	34" W x 70" D x 80" H (87 cm x 178 cm x 204 cm)
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Compressors	Two @ 2 1/2 HP
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Interior Airflow	400 scfm (11.3 cubic meters/min)
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Shipping Weight	1400 Pounds (637 kg)
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Electrical Voltage	230v/3PH/60Hz 80 Amps Full Load, 100 Amp Minimum Service
	460v/3PH/60Hz 40 Amps Full Load, 50 Amp Minimum Service
	400v/3PH/50Hz 33 Amps Full Load, 40 Amp Minimum Service

Specifications subject to change.

ATSS-30 Features and Benefits

- Fits easily through a 36" wide door opening.
- Covers a wide range of MIL-STD and other industrial test specifications with temperature conditions from -73°C to +215°C.
- Enhanced high volume air distribution allows for improved product temperature change rates and better uniformity.
- Self-contained compact design – on-board air-cooled condenser and hydraulic transfer pump save floor space and require fewer utility connections.
- Heating and cooling capabilities in both zones enhance performance and control.
- 7825 Programmer Controller including:
 - A 3½" disk drive for convenient storage and transfer of test data
 - 5" LCD display accommodates lots of easy-to-read information
 - Graphing of test profiles
 - Display of transfer basket location
 - Programmed automatic defrost cycle
 - Product temperature control, programmable off-set, and selectable transfer soak software algorithms
 - Built-in system status, monitor, and alarm functions
 - Pre-programmed thermal shock and stress profiles