ATSK

King Son ATSK Air to Air Thermal Shock Test Chamber
(for stationary specimens testing)

ADVANCED SERIES

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Advanced

King Son ATSK Air to Air Thermal Shock Test Chamber (for stationary specimens testing)

King Son ATSK Air to Air Thermal Shock Test Chamber is designed to test the material structure or composite material of the product, in which the material can in an instant withstand the continuous environmental extremely high temperature and extremely low temperature change.

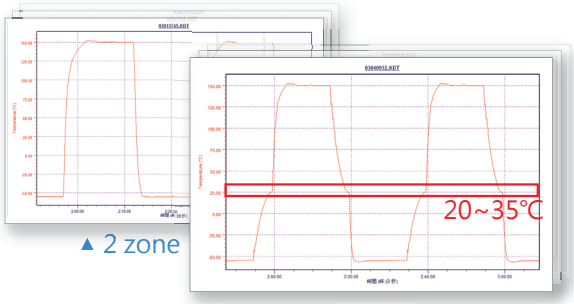
King Son ATSK Air to Air Thermal Shock Test Chamber is used to test the chemical changes or physical damages of the material caused by thermal expansion and contraction in the shortest time, the applicable test objects include metal, plastic, rubber, electronics and other materials, which can be used as the basis and reference for product improvement.

Laboratory class

Advanced specification, professional design, complying with international testing standards.

Ultra-Premium Class design

Meet the thermal shock test requirements with 3 testing zones design in which the ambient room air temperature in 3rd zone is 20~35℃ to avoid frost and condensation on the surface of the specimens during testing.

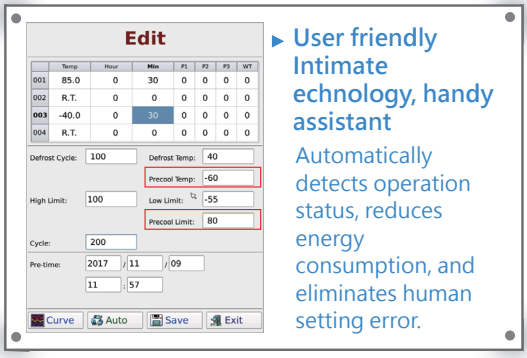


▲ 2 zone

▲ 3 zone

Smart specimens loading adjustment

Pre-cooling and pre-heating adjustment with smart design by the specimens loading volume.
According to the loading volume of the specimens (DUT, Device Under Test), the Chamber automatically adjust the setting for pre-cooling and pre-heating parameters instead of traditional manual setting.



▶ **User friendly Intimate echnology, handy assistant**

Automatically detects operation status, reduces energy consumption, and eliminates human setting error.

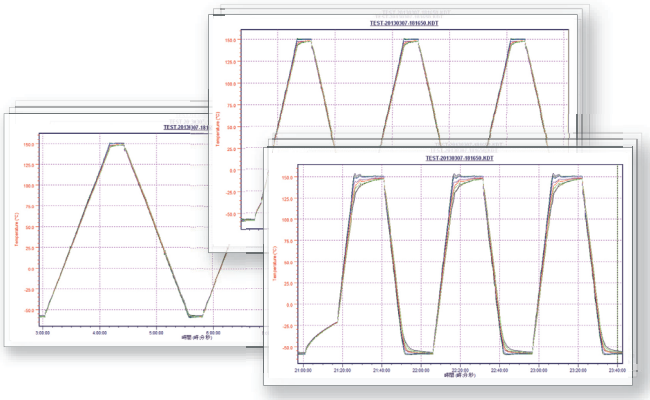
Ultra-less number of defrosting

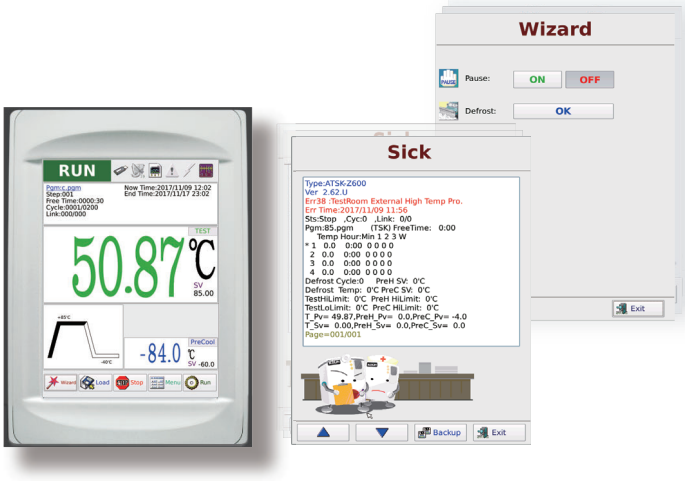
High, low, and ambient room temperature thermal shock test (in 3 zones) for 100 cycles; high and low temperature thermal shock test (in 2 zones) for Model A/B 1000 cycles, Model C/D 700 cycles, free from defrosting, shorten testing time and energy consumption.

Perfect scalable option

Can be upgradable to King Son Thermal Stress Complex Test Chamber (TSC LR/HR).

King Son LabTech Controller, configured with full-color touch panel LCD display





▲ The actual testing curve diagram illustrated the temperature change rate 3 - 30 °C/minute (that is adjustable by demands) and thermal shock testing functions can be conducted in either 2 Zones or 3 Zones.

King Son ATSK Air to Air Thermal Shock Test Chamber is designed with 8 channels of temperature sensors for temperature control and detection application.

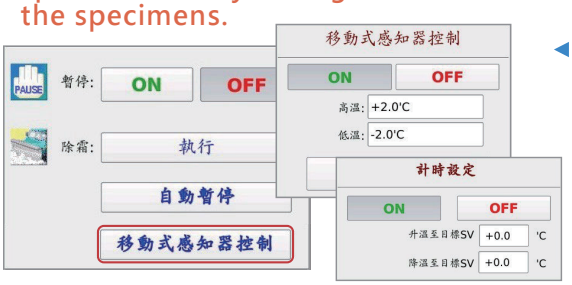
King Son ATSK Air to Air Thermal Shock Test Chamber is designed with 8 channels of temperature sensors attached to the surface of the testing specimens for thermal shock testing.

During thermal shock testing, the dwell time starts counting down when the surface temperature of specimens reached the setting temperature.

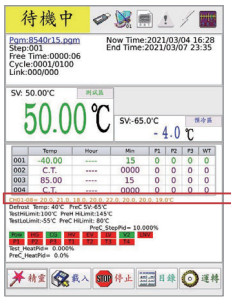
During thermal shock testing, the setting conditions, testing temperature, and surface temperature of the test specimens are measured and recorded together that constitute a synchronous testing curve.

The 8 channels temperature detection application by dual modes

The dwell time is determined by two modes either by the surface temperature control of the specimens or by during thermal shock testing process, the surface temperature measured records of the specimens.



◀ The dwell time for thermal shock testing
The screen on King Son LabTech Controller displays the surface temperature control of the specimens.



◀ King Son LabTech Controller Displays and records 8 channels temperature measurement data during thermal shock testing process.

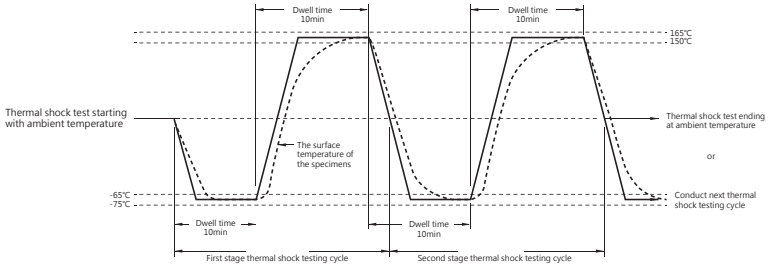
The surface temperature control features for the dwell time required for thermal shock testing:

The dwell time required for thermal shock testing can be determined by two modes either by the air temperature above the specimens or by the surface temperature control of the specimens.

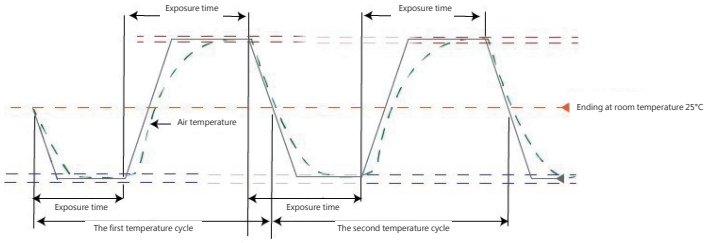
Use 2 channels for surface temperature control of the specimen, and the remaining 6 channels used for multi-sensors temperature recording during thermal shock testing process.

The dwell time is based on the surface temperature control specification of the specimens by testing standards:

MIL-STD-883K, MIL-STD-202H (the air temperature above testing specimens)



▲ The diagram for the dwell time, mapped by the surface temperature control of the specimens. Thermal shock testing was conducted by the surface temperature control of the specimens.



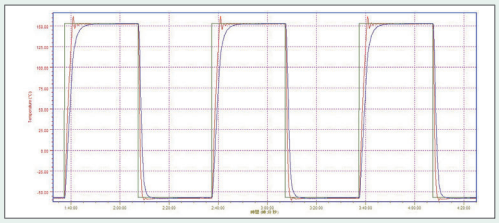
▲ The diagram for the dwell time, mapped by the air temperature above the surface of specimens.

※The actual measurement testing case done by the surface temperature control of the specimens to validate the dwell time：

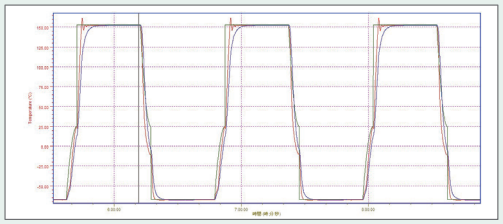
Testing Measurement definition

- PCB board (15×13cm) 19 pieces in each group, in 2 layers (in upper and lower layer racking), 76 pieces in total (total weight: 4.46 kg).
- Fixture racking: eight groups with a total weight of 3.04 kgs (two groups each in upper and lower layer racking), total loading: 7.5 kg.
- The control for the dwell time required for thermal shock testing is done by the surface temperature control wire attached to the central point of the PCB specimens to measure and control the surface temperature of the specimens.

Setting temperature Air temperature Surface temperature of the specimens



▲ The dwell time for high and low temperature 2 zones thermal shock testing method, the diagram is mapped by the actual testing curve of the surface temperature control of the specimens.



▲ The dwell time for high, low and ambient room temperature 3 zones thermal shock test method, the diagram is mapped by the actual testing curve of the surface temperature control of the specimens.

The testing standards for King Son ATSK Air to Air Thermal Shock Test Chamber

Testing standards	Exposure Temperature (°C)			Exposure Time (Min.)		Recovery Time	Cycle or number of times	Starting temperature to test	Note	Applicable models ATSK-(A/B/C/D/G)		
	High temperature	Room temperature	Low temperature	High temperature/ low temperature	Room temperature					5T	4T	3T
MIL-STD-883E (Method No.1010.7)	+85 0	----	-55 0 -10	≧10min ≦15min	----	Includes exposure and transfer times ≦ 15min	Minimum of 10 cycles	Low temperature or High temperature	Temperature Cycling (transfer time <1min) Tests must be re-performed if more than 1/10 of the cycles are interrupted	◎	----	----
	+15 +125 0									◎	----	----
	+15 +150 0									◎	----	----
	+15 +150 0		-65 0 -10							◎	----	----
MIL-STD-202F (Method No.107G)	+3 +85 0	+10 25 -5	-55 0 -3	Under 28g 15～30min 28～136g 30Min 136g～1.36Kg 60Min 1.36～13.6Kg 120Min 13.6～136Kg 240Min	Max. 5min	Within 5min	5 cycles 25 50 100	Low temperature	Transfer time ≦ 5min	◎	◎	◎
	+3 +125 0		-65 0 -5							◎	◎	----
	+3 +150 0		-65 0 -5							◎	◎	----
JIS C 0025 IEC 68-2-14 GB 2423.22	±2 +70	---	-5 ±3	3hr 2hr 1hr 30min Default of 3 hours for undefined exposure time	----	1/10 of exposure time	5 cycles Unless otherwise specified	Low temperature	Auto-transfer time ≦ 30 sec Small specimen transfer time ≦ 10 sec	◎	◎	◎
	±2 +85		-10 ±3							◎	◎	◎
	±2 +100		-25 ±3							◎	◎	◎
	±2 +125		-40 ±3							◎	◎	◎
			-55 ±3							◎	◎	----
			-65 ±3							◎	----	----
IPC 2.6.6	+3 +85 -0	+10 -25 -5	-55 +0 -5	30min	10-15 min		5 cycles			◎	◎	◎
	+3 +125 -0		-65 +0 -5							◎	◎	----
Bellcore GR-1221-CORE	±2 +70	----	-40 ±2	≧15min	----		500 cycles OR 1000 cycles			◎	◎	◎
	±2 +85		-40 ±2							◎	◎	◎
JESD22 A104-A	+10 +85 -0	----	-40 +0 -10	≧10min ≦15min	----	Includes exposure and transfer times ≦ 15min	10 cycles are acceptable; qualify after 1000 cycles		Temperature cycling (transfer time <1min) Tests must be re-performed if more than 1/10 of the cycles are interrupted	◎	◎	◎
	+10 +125 -0		-55 +0 -10							◎	----	----
	+10 +150 -0											
	+10 +150 -0		-65 +0 -10							◎	----	----

High Efficiency Swep Heat Exchanger

Semi-hermetical professional compressor

King Son ATSK Air to Air Thermal Shock Test Chamber Specification

Model		ATSK-B3	ATSK-C3	ATSK-D3	ATSK-G3	ATSK-A4	ATSK-B4	ATSK-C4	ATSK-D4	ATSK-G4	ATSK-A5	ATSK-B5	ATSK-C5
Structure		Precooling Zone, Heating Zone, Testing Zone Selectable 2-Zone or 3-Zone Testing methods for stationary object testing											
Damper Device		Forced Air Damper											
Interior Material		Stainless Steel #304											
Exterior Material		SECC + 9493 powder coating (3B Surface Treatment)											
Testing mesh shelf		Stainless Steel mesh shelf											
Refrigeration		Cascade Refrigeration System											
Cooling Method		Water Cooling											
Ambient Temperature		5°C～30°C											
Temperature range	H.T. Shocking	+60°C～ +150°C				+60°C～ +150°C					+60°C～ +150°C		
	L.T. Shocking	0°C～ -55°C				0°C～ -65°C					0°C～ -65°C		
	Precooling Temperature	-10°C～-70°C				-10°C～-70°C					-10°C～-70°C		
Temperature Uniformity		Under±2.00°C											
Simulated Load IC (kg)		5.0	7.5	10	15.0	2.5	5.0	7.5	10	15	2.5	5.0	7.5
Transition time		<10 Sec											
Recovery time	HT IN 3-Zone	RT°C～+150°C/5min				RT°C～+150°C/5min					RT°C～+150°C/5min		
	HT IN 3-Zone	RT°C～-55°C/5min				RT°C～-65°C/5min					RT°C～-65°C/5min		
	HT IN 2-Zone	-40°C～+150°C/5min				-55°C～+150°C/5min					-65°C～+150°C/5min		
	HT IN 2-Zone	+150°C～-40°C/5min				+150°C～-55°C/5min					+150°C～-65°C/5min		
Dwell time		30min				30min					30min ; 15min *Note 1		
Precooling Time (min)		65	65	65	80	65	65	65	65	80	55	55	55
Control system	Sensor	PT 100×2											
	Controller	IPC-based King Son LabTech Controller, configured with full-color touch panel LCD display.											
	Setting Range	Temperature: -70.00~+150.00℃ / Time:0h1m～9999h59m / Cycles:1~9999cycles											
	Resolution	Temperature: 0.01℃ / Time:1min											
	Output Mode	PID+PWM+SSR Control Method											
	Scalable option	Detection control for outlet and inlet sensor / RS-485 CM Bus / AI CM Remote Monitoring and Management System / LN2 liquid nitrogen rapid cooling controlling device											

*Note 1: Under these conditions, the load of the specimen must be controlled at up to 50% of the specifications.

King Son ATSK Air to Air Thermal Shock Test Chamber Specification

Model	(W*D*H)cm	Full load current MAX.	Power KW	Water tank	Water pipe diameter Inflow water pressure range 1~3.5Kg/cm²)
ATSK-A4	Interior: 40x40x40cm Exterior: 129x221x200cm	220V 3Phase 81A 380V 3Phase 47A	31KW	10 tons	1 1/2 inches
ATSK-A5	Interior: 40x40x40cm Exterior: 129x236x200cm	220V 3Phase 86A 380V 3Phase 50A	33KW	15 tons	2 inches
ATSK-B3	Interior: 50x40x40cm Exterior: 139x194x200cm	220V 3Phase 73A 380V 3Phase 42A	27.8KW	10 tons	1 1/2 inches
ATSK-B4	Interior: 50x40x40cm Exterior: 139x220x200cm	220V 3Phase 109A 380V 3Phase 63A	41.5KW	15 tons	2 inches
ATSK-B5	Interior: 50x40x40cm Exterior: 139x244x200cm	220V 3Phase 122A 380V 3Phase 71A	46.4KW	20 tons	2 inches
ATSK-C3	Interior: 60x55x50cm Exterior: 149x205x208cm	220V 3Phase 89A 380V 3Phase 52A	34KW	10 tons	1 1/2 inches
ATSK-C4	Interior: 60x55x50cm Exterior: 149x231x208cm	220V 3Phase 129A 380V 3Phase 75A	49.1KW	20 tons	2 inches
ATSK-C5	Interior: 60x55x50cm Exterior: 149x250x208cm	220V 3Phase 148A 380V 3Phase 86A	56.4KW	25 tons	2 1/2 inches
ATSK-D3	Interior: 70x60x60cm Exterior: 159x213x208cm	220V 3Phase 117A 380V 3Phase 68A	44.5KW	15 tons	2 inches
ATSK-D4	Interior: 70x60x60cm Exterior: 159x230x208cm	220V 3Phase 147A 380V 3Phase 85A	56KW	25 tons	2 1/2 inches
ATSK-G3	Interior: 80x70x60 cm Exterior: 169x238x208cm	220V 3Phase 143A 380V 3Phase 83A	54.4KW	20 tons	2 inches
ATSK-G4	Interior: 80x70x60 cm Exterior: 169x244x208cm	220V 3Phase 176A 380V 3Phase 102A	67KW	30 tons	2 1/2 inches

※The actual specifications may vary, Please refer to the actual price quotation for the above specifications

Model Coding

ATSK - A 4 T - 150 - OPTION

- BS=Special specification
- High Temperature =150℃
- Touch panel
- Low Temperature
  - #3=-55℃
  - #4=-65℃
  - #5=-65℃
- Inner dimension (W x D x H)
  - A= 40x40x40cm
  - B= 50x40x40cm
  - C= 60x55x50cm
  - D= 70x60x60cm
  - G= 80x70x60cm
  - E= Customer size
- Air to Air Thermal Shock Test Chamber

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ISO 9001 : 2015

Quality Management Systems
King Son Instrument Tech. Co., Ltd.
has established and applies
a Quality Management System for
Development, Production and Distribution of Temperature & Humidity Chamber, Walk-In Chamber, Thermal Shock Tester, Oxidation-Free Oven, HAST (Highly Accelerated Stress Tester), High Pressure Accelerating Life Tester and Convertible IFP (Initial Freezing Point) Food-Tech Chamber.

*Certification Body of TÜV SÜD Asia Ltd. Taiwan Branch Management Service Department

ISO 14001 : 2015

Environmental management systems
King Son Instrument Tech. Co., Ltd.
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*The Certification Body of TÜV SÜD Asia Pacific TÜV SÜD Group

LOW GWP REFRIGERANT
R448A
R448A refrigerant an excellent replacement for R404A

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