



TORONTECH

ESS ENVIRONMENTAL STRESS SCREENING CHAMBER



Environmental Stress Screening (ESS) chambers are advanced testing systems designed to detect early-life failures and manufacturing defects in products by exposing them to accelerated environmental conditions. These chambers simulate rapid temperature changes, vibration, humidity, and other stressors that products may encounter during their lifecycle. By replicating extreme operational environments, ESS chambers help manufacturers identify weaknesses or design flaws, ensuring only high-quality, reliable products reach the market. This process is particularly valuable for industries that demand rigorous quality control, such as aerospace, automotive, defense, and electronics.

APPLICATIONS

Applications of ESS Chambers

ESS chambers are used to screen a wide variety of products, including circuit boards, electronic assemblies, mechanical components, and battery systems. These chambers simulate real-world stress conditions that could lead to failures, such as rapid temperature cycling, high humidity, and mechanical vibrations. In the electronics industry, ESS testing helps ensure that sensitive components can endure the stress of assembly, shipping, and operational environments. Aerospace and defense industries rely heavily on ESS testing to guarantee the reliability of mission-critical components, while automotive manufacturers use ESS chambers to validate the performance of safety-critical systems like sensors, control units, and electrical subsystems.

ESS Testing Standards

To ensure consistency and accuracy, ESS chambers are designed to meet various international standards, including MIL-STD-810 for environmental engineering considerations, MIL-STD-2164 for ESS procedures for electronic equipment, and IEC 60068-2 for environmental testing methods. For vibration testing, standards like ISO 16750 and ASTM D4728 may apply, depending on the industry and product. These standards define the parameters for stress screening, including the rates of temperature change, vibration frequencies, and humidity levels, ensuring that tests accurately mimic real-world conditions.

Torontech's ESS chambers are engineered to comply with these global standards, offering precise control, customizable testing options, and reliable results to meet the diverse needs of quality-driven industries.

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TECHNICAL SPECIFICATIONS

Model No.	ToronESS-150S F/X	ToronESS-225S F/X	ToronESS-370S F/X	ToronESS-504S F/X	ToronESS-720S F/X	ToronESS-1000S F/X
Test Space Volume Liters	150	225	370	504	720	1000
Inner chamber size W×H×D(mm)	600×600×460	700×700×480	800×900×510	800×900×700	900×1000×800	1000×1000×1000

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Exterior chamber size W×H×D(mm)	800×1780×1480	900×1750×1910	1000×1930×1940	1000×1900×2050	1100×2000×2250	1200×2070×2630
Temperature range	-70°C to +150°C (180°C optional)					
Temperature fluctuation	±0.5°C					
Temperature uniformity	≤ 2.0°C					
Temperature deviation	≤ ±2.0°C					
Temperature change rate acc. IEC 60068-3-5	Heating rate 5°C/min, 10°C/min, 15°C/min, cooling rate 5°C/min, 10°C/min, 15°C/min (empty load) F: non-linear control X: linear control					
Exterior chamber material	High-quality carbon steel with painting					
Interior chamber material	SUS304 matte stainless steel plate					
Insulation material	Rigid polyurethane foam insulation					
Refrigeration system	Water cooled					
	Semi-hermetic compressor					
Heater	High-quality nickel-chromium alloy heater					
Blower	Centrifugal blower					
Observation window	Heating film insulating glass					
Controller	Touch Screen Controller with PID control					

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Safety protection device	NFB(No fuse breaker), over pressure, over heat and over current protectors for compressor, over temperature protectors, over load protector of fan, dry heat protector, short of water protector					
Standard accessory	Sight window*1, Cable port(port Φ50mm*2), Shelves*2, LED Lighting device*1 Mobile Casters with foot cups					
Ambient temperature	+5 to +35°C					
Voltage	380V AC 3Ø 50Hz					
Customization service	Non-standard or special requirements can be customized.					



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