

Climatic & Environmental Test Chambers

CAPABILITY SHEET · -70 TO +150 DEG C · ENGINEERED TO ORDER

THE SYSTEM

WHAT	An insulated, vapour-tight test space whose air temperature and relative humidity are driven along a programmed profile while the specimen sits inside - so a product can be made to experience a winter night, a tropical monsoon or a desert afternoon on demand, repeatedly, indoors.
WHY IT IS HARD	Not the set-point. Holding uniformity at nine points across a large space is an air-distribution problem; a powered specimen adds 5-10 kW of its own heat; and the same box must reach 98 %RH and then -70 degC without icing its own evaporator.
STATUS	Engineered to order. Reference configuration, not yet built - engineered against repeated Indian test-laboratory requirements; no order followed, so no delivered chamber is claimed.

ENVELOPE

TEMPERATURE	-70 degC to +150 degC at atmospheric pressure; typical qualification work -40 to +85 degC. Control accuracy +/-1 to +/-2 degC, uniformity within +/-2 degC measured at nine points per IEC 60068-3-5, resolution 0.1 degC, Pt-100 sensing.
HUMIDITY	10-98 %RH over roughly +10 to +90 degC, control and uniformity +/-3 %RH, dew point about +4 to +89 degC, capacitive sensing.
RAMP & SIZE	Up to 5 degC/min unloaded and about 1-3 degC/min under load - both quoted, because they describe different machines. Test space from a 50-70 litre reach-in, through a walk-in of about 4.0 x 2.0 x 2.2 m, to drive-in halls for a complete vehicle.

HOW IT IS BUILT

REFRIGERATION	Two-stage cascade - stage 1 cools the condenser of stage 2, which is how -70 degC is reached. Semi-hermetic compressors on anti-vibration mounts, non-CFC refrigerant, finned-tube evaporator, water-cooled condenser with matched chiller, high/low pressure cut-outs.
HEAT & MOISTURE	Indirect heating by stainless sheathed elements placed so no heater radiates onto the specimen. Droplet-free vapour humidification from demineralised water, stainless reservoir for about 72 h continuous running, refrigeration dehumidification and condensate drain for the down-ramp.
THE WALL	Polished SS 304 liner hermetically welded vapour-tight, then a double vapour barrier, then multi-layer mineral-fibre or elastomeric insulation, then galvanised double-coated steel. The barrier is the critical layer: moisture in the insulation condenses, then freezes, and the chamber quietly loses its low end.

SAFETY, CONTROL & ENGAGEMENT

SAFETY	
CONTROL	PLC with colour touch HMI operating standalone - running, logging and calibration must not need a PC. About 50 programs x 50 segments nested to 50 loops, USB and Ethernet, CSV export, live and historical curves, fault pages, remote monitoring over LAN or VPN.
ENGAGEMENT	Send the profile you need to run, the specimen size and its heat dissipation, and the standard being executed, to sales@neometrixgroup.com - compliance matrix within two working days.

PROJECTS DESK

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