

# CTS

# Climatic Testing Systems

Bringing the Desired Climate to Your Doorstep



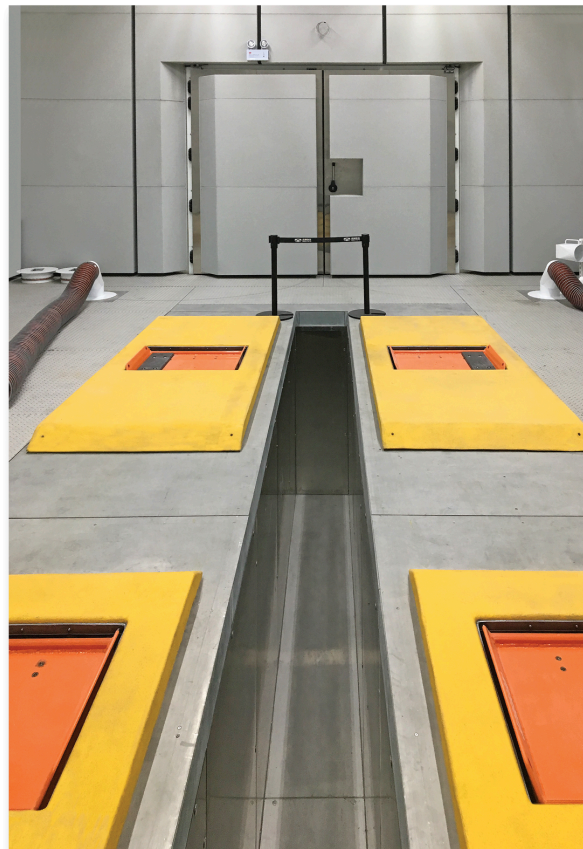
## 4-POST TEST CHAMBER



The 4-Post Test Chamber is designed to provide road durability testing at various environmental conditions in the laboratory. In addition, this facility is designed to duplicate in the lab the actual stresses produced while driven on a road course. This not only allows for direct correlation of road durability test conditions, but has proven to be of help in identifying precise causes of squeak and rattles. The ability of this type of facility to change from one vehicle to another quickly and produce the actual field conditions caused by road stresses, temperature, humidity and solar loads has been instrumental in development of higher vehicle quality levels.

### System Design & Features

Parameter	Specifications
Outside Dimensions	9.05 m (L) X 8.05m (W) X 5.254m (H)
Inside Dimensions	8.8 m (L) X 7.8m (W) X 5m (H)
Walls and ceiling panel insulation	127mm thick Polyurethane Density > 45 kg/m
Walls and ceiling interior finish	Stainless Steel
Walls and ceiling exterior finish	White Galvanized Steel
Floor interior finish	Stainless Steel, Anti-Slip surface
Floor Load	1000 kg/wheel
Floor Interface with four	CTS to design, supply and install
Vehicle Entry Door	3.2m (W) X 3.1m (H), 101mm thick, Qty. 1, Double leaf swing door with heated door frame.
Personnel Door	1.1m (W) X 2.2m (H), Qty. 1, Single swing door with heated door frame.
Temperature Range	-40°C to +70°C
Relative Humidity	No condensation in whole temperature range



*(Over for more information)*

### Chamber Airflow Specifications

Supply Airflow Control Range 20,000 m3/hr.  
Control Method Variable Speed Control  
Control Type Automatic through VFD

### Makeup Air

Fresh air flow to chamber  $\geq 900$  kg/hr  
Pre-Cool DX Coil  
Pre-Heat Electric Heater  
Dehumidification Desiccant Wheel  
Pressure in the chamber -50 to 0 Pa  
Intake air location Outside the building, -10 to +40°C  
Air Supply Min. dew point  $\leq -40^\circ\text{C}$   
Air Supply Max. Temperature  $\leq 25^\circ\text{C}$

### Vehicle Exhaust System

Vehicle Airflow Control Range  $\geq 1000$  kg/hr  
Inlet Positions Either side of vehicle  
Duct Size 300mm or direct sealed connection to the vehicle exhaust  
Duct Materials SS inside chamber, galvanized outside  
Control Method Variable Speed Drive  
Make Up Air Inlet Conditions Dry Bulb: 20°C, Relative Humidity 10 to 90%  
Vehicle Conditioning System Requirements  
1. Vibration test Condition: The vehicle will be test on the 4-Post system. The engine will not be started, no heat load from the vehicle.  
2. Road Running Condition: The engine runs at highest speed without load, without climatic control.

### Air Temperature & Humidity Specifications

Dry Bulb Temperature Range  $-40^\circ\text{C}$  to  $+70^\circ\text{C}$   
Humidity control range No condensation in whole temperature range  
Temperature Control Stability  $\pm 1^\circ\text{C}$  during Steady State  
Control Type Single Point PID  
Cooling Control Method Direct Evaporation  
Heating Control Method Electric Heater Power Modulation  
Temperature sensor RTD  
Cooling Transition Rate  $\geq 0.3^\circ\text{C}/\text{min}$  average over temperature range  
Heating Transition Rate  $\geq 0.3^\circ\text{C}/\text{min}$  average over temperature range  
Measurement Accuracy  $\pm 2\%$  FS

### Air handling System Specifications

Supply Blower 11 kW (15 HP) Centrifugal  
Capacity Control VFD

### Refrigeration System Specifications

Compressor TWO (2) 37 kW (50 hp), Bitzer Screw Compressors  
Refrigerant R-404a  
Refrigeration System Capacity 50.5kW @  $-40^\circ\text{C}$  Chamber Temperature  
Capacity Control Compressor staging, Hot Gas Bypass and Liquid Injection  
Condenser Water Cooled  
Refrigeration Skid Dimensions 4.6 m (L) x 2 m (W) x 2.1m (H)

### Heating System Specifications

Heater Type 60 kW Low Watt density Sheathed  
Heater Control SCR

### Humidification System Specifications

Humidification Type Low Pressure Steam Generator  
Control Heater Power  
Dispersion Method Copper Tubes

### Sound Level Specifications

Noise at duct entering muffler  $\leq 55$  dB(A)  
When AHU running without compressor  $< 45$  dB(A)

- > Control System PLC Allen-Bradley Logix System
- > Operator Interface Windows
- > Application Software SpecView
- > Functions:
  - Operator Interface
  - Real-Time Monitoring,
  - Data logging,
  - Test Sequencing,
  - Alarm annunciation and logging.
- > Hardware: High End PC
- > High discharge Pressure, Low suction pressure, Low Oil Pressure, High Discharge Temperature Compressor Overload
- > Emergency Stop: Qty.2
- > Fire Sensor Location Provided by CTS at Heater
- > Hazardous Gas HC and CO detection inside chamber



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### Climatic Testing Systems

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