

GTR-G3 Gas Permeability Tester

(Differential pressure method)

GTR-G3 Gas Permeability Tester is based on the differential pressure method, and is professionally applicable to the determination of gas transmission rate (GTR) as well as solubility coefficient, diffusion coefficient and permeability coefficient of plastic films, composite films, high barrier materials, sheeting, aluminum foils, rubber, tire and permeable membrane.



Advanced Technology

- The three permeation cells are completely independent, and can test three identical specimens or distinct specimens simultaneously
 - Equipped with imported high-precision vacuum sensor and pressure sensor ensure the test accuracy
 - World's first advanced water circulated temperature control system, realized temperature auto control and wider temperature range
 - Independent temperature control for upper/lower chamber and electrolytic sensor, which ensures the accuracy of the test results
 - Self-developed airtight piping system reduces system errors and makes test results more accurate
 - Unique sample anti-leakage structure design, ensure the seal stability of samples
 - Automatic pressure holding function, which can adjust the pressure of the upper chamber in real time to ensure the constant pressure difference between the upper/lower chambers during the test
 - 7" color touch screen, with professional operating system, the test process is completed the results are displayed automatically
 - With high-speed vacuuming capability, more thorough degassing, short test cycle and high efficiency
-

High-end Configuration

- Two test modes: proportional mode and standard mode
- The system has self-checking capability to ensure that the equipment is in normal test state at any time
- Gas transmission rate, solubility coefficient, diffusion coefficient and permeability coefficient of the specimen could be obtained at one operation
- Test range could be extended based on requirements to test the materials with low permeability
- Imported components make the operation of the instrument more stable and reliable
- Reference film for fast calibration to ensure accurate and universal test data
- With automatic save function after power failure
- Standard RS232 port for convenient data transfer
- The whole testing process is monitored, automatically recorded, and can be reproduced in the whole process
- The software is equipped with data traceability, which can realize functions such as multi-level authority management, audit trail, electronic signature, etc., which meets the requirements of GMP (optional)

Test Principle

The pre-conditioned specimen is mounted in the gas diffusion cell as to form a sealed barrier between two chambers. The lower-pressure chamber is firstly evacuated, followed by the evacuation of the entire cell. A flow of gas is thereafter introduced into the evacuated higher-pressure chamber and a constant pressure difference is generated between two chambers. The gas permeates through the specimen from the higher pressure side into the lower side. The gas permeability and other barrier properties of the specimen can be obtained by monitoring the pressure changes in the lower chamber.

Applications

Basic Applications	Films	Including plastic films, plastic composite films, paper-plastic composite films, coextruded films, aluminized films, aluminum foils, aluminum foil composite films and many others
	Sheeting	Including engineering plastics, rubber and building materials, e.g. PP, PVC and PVDC
Extended Application	Petrochemical	Including transportation pipelines, such as MDPE plastic CO ₂ testing
	Various Gases	Test the permeability of various types of gases, e.g. O ₂ , CO ₂ , N ₂ , Air and He
	Inflammable, Explosive	Test the permeability of inflammable and explosive gases

Gases	
Biodegradable Films	Test gas permeability of various sorts of biodegradable films, e.g. starch-based biodegradable bags
Materials for Aerospace Usage	Test the Helium permeability of airship gas bags
Paper and Paper Board	Test gas permeability of paper and paper-plastic composite materials, e.g. aluminized paper for cigarette packages, Tetra Pak sheeting, paper bowls for instant noodles and disposable paper cups
Paint Films	Test gas permeability of substrates coated paint films
Glass Fiber Cloth and Paper	Including glass fiber cloth and paper materials, e.g. Teflon paint cloth, Teflon welding cloth and Teflon silicon rubber cloth
Soft Tube Materials for Cosmetics	Including various types of cosmetic tubes, aluminum-plastic tubes and toothpaste tubes
Rubber Sheeting	Including various sorts of rubber sheeting, e.g. car tires
Vacuum Packaging	Including vacuum packaging manufacturing sheets that are easily susceptible to gas oxidation and corrosion, such as electronic products, such as consumable sensors, etc.

Technical Specifications

Specifications	GTR-G3
Test Range	0.05 ~ 50,000 cm ³ /m ² ·24h·0.1MPa (standard volume) At least 500,000 cm ³ /m ² ·24h·0.1MPa (extended volume)
Number of Specimens	3
Number of Sensors	3
Test Mode	Three chambers independent
Vacuum Resolution	0.1 Pa
Vacuum Degree of Test Chamber	<20 Pa
Test Temperature	5°C ~ 95°C ±0.1°C (dry gas at standard atmospheric pressure)

Temperature Accuracy	±0.1°C
Test Pressure	-0.1 MPa ~ +0.1 MPa
Gas Supply Pressure	0.1 MPa ~ 0.8 MPa
Test Gas	O ₂ , N ₂ and CO ₂ (outside of supply scope)
Carrier Gas Interface	Φ6
Vacuum Pipe Diameter	1/4"
Correction Method	Standard film calibration, external calibration of vacuum sensor
Specimen Thickness	≤3mm
Specimen Size	Φ97 mm
Test Area	38.48 cm ²
Instrument Dimension	740 mm (L) x 415 mm (W) x 430 mm (H)
Power Supply	AC 220V 50Hz
Net Weight	50 kg

Standards

ASTM D1434, GB/T 1038, YBB 00082003, ISO 2556, ISO 15105-1, JIS K7126-A

Configuration

Standard configuration: Instrument, vacuum pump, vacuum pipe, gas tube, pressure regulator, sampler, vacuum grease, reference film, temperature controlling device.

Optional configuration: Computer, container testing fixture, sampler blades, vacuum grease, filter paper, humidity generator.

Note: Customer need to prepare testing gas.
