PERME® VAC-V1 (EX) Gas Permeability Tester

VAC-V1 (EX) Gas Permeability Tester is based on the differential-pressure method, and is professionally applicable to the determination of gas transmission rate of common gases as well as toxic, flammable or explosive gases. VAC-V1 (EX) is suitable for the determination of gas transmission rate, solubility coefficient, diffusion coefficient and permeability coefficient of plastic films, composite films, high barrier materials, sheeting and foils at varied temperatures.



Professional Technology

- The tester adopts Labthink's latest split control design, and complete separation between the mainframe and its control module is realized to ensure testing safety.
- It is suitable for the gas permeability tests of flammable, explosive or toxic gases.
- Gas transmission rate, permeability coefficient, solubility coefficient and diffusion coefficient can be determined simultaneously.
- Wide-range and high-precision liquid circulation temperature controller satisfies tests under different test conditions.
- Dual test process judgement modes are available: Proportional Mode and Fuzzy Mode.
- The test range could be extended based on needs to satisfy testing requirements for high permeability materials.
- Data fitting at any temperatures can be performed, and test results of extreme conditions could be easily obtained.
- PC-controlled, and the testing process can be accomplished automatically.
- Reference film is available for rapid calibration to ensure accuracy and versatility of test data.
- RS232 universal data port is equipped for convenient data transfer.
- The Tester is compatible with Lystem™ Lab Data Sharing System for uniform management of test results and test reports.

Test Principle

VAC-V1 (EX) Gas Permeability Tester is designed based on the differential-pressure method. The pre-conditioned sample is mounted in between the upper testing chamber and lower testing chamber and clamped. First, the lower-pressure chamber (i.e., lower testing chamber) is evacuated, followed by the evacuation of the entire system. When the desired vacuum degree is reached, close the lower testing chamber and test gas of a certain pressure is flushed to the higher

pressure chamber (upper testing chamber), and a constant pressure difference (adjustable) is formed between the two chambers. The gas permeates through the sample from the high pressure side into the low pressure side due to pressure gradient. The gas permeability properties of the sample can be obtained by monitoring the pressure changes in the lower pressure chamber.

The tester conforms to multiple national and international standards: ISO 15105-1, ISO 2556, GB/T 1038-2000, ASTM D1434, JIS K7126-1 and YBB 00082003.

Applications

Basic Applications	**Films**	It is applicable to gas transmission rate tests of various plastic films, plastic composite films, paper-plastic composite films, coextruded films, aluminized films, aluminum foils, aluminum foil composite films and other film materials.
	Sheeting	It is applicable to gas permeability tests of engineering plastics, rubber, building materials, and other sheeting materials, e.g. PP sheeting, PVC sheeting and PVDC sheeting, etc.
Extended Applications	**Various Gases**	It is applicable to gas permeability tests of various gases, e.g., O_2, CO_2, N_2, Air and He, etc.
	Flammable & Explosive Gases	It is applicable to gas permeability tests of flammable and/or explosive gases.
	Bio-degradable Films	It is applicable to gas permeability tests of bio-degradable films, such as starch-based bio-degradable pouches, etc.
	Materials for Aerospace Usages	It is applicable to gas permeability tests of materials used for aerospace applications, such as Helium permeability test of gasbags for airships.
	Paper and Cardboard	It is applicable to gas permeability tests of paper and paper-plastic composite materials, such as aluminized paper for cigarette packages, Tetra Pak sheeting, paper bowls for instant noodles and disposable paper cups, etc.
	Paint Films	It is applicable to gas permeability tests of paint coating on substrates.
	Glass Fiber Cloth and Glass Fiber Paper, etc.	It is applicable to gas permeability tests of glass fiber cloth and glass fiber paper materials, such as Teflon paint cloth, Teflon welding cloth and fluorosilicate cloth, etc.

Cosmetic Tube Materials	It is applicable to gas permeability tests of sheeting for various cosmetic tubes, aluminum-plastic tubes and toothpaste tubes, etc.
Rubber Sheeting	It is applicable to gas permeability tests of various rubber sheeting, such as gas permeability test for tires.

Technical Specifications

Item	Film Test
Test Range	0.05 ~ 50,000 cm^3/m^2·24h·0.1MPa (Common)
	Upper limit is no less than 500,000 cm^3/m^2·24h·0.1MPa (Extended Volume)
Number of Samples	1 piece
Vacuum Resolution	0.1 Pa
Vacuum Degree of Test Chamber	≤10 Pa
Temp. Control Range	5℃～95℃
Temp. Fluctuation	±0.1°C
Sample Size	Φ97mm
Test Area	38.48 cm^2
Test Gases	H_2, O_2, N_2, and CO_2, etc. (Gas sources are to be provided by the users)
Test Pressure	10kPa~200kPa (Common)
Gas Source Pressure	0.5 MPa ~ 0.6 MPa
Port Size	Φ6 mm Polyurethane tube
Dimensions	500 mm (L) x 575 mm (W) x 450 mm (H)
Power Supply	AC 220V 50Hz
Net Weight	50 kg

✧ For users with special needs, our company can carry out customized production for users within the scope of our capacity to meet their needs.

Configurations

Standard	Mainframe, Thermostatic Controller, Professional Software, Professional Sampler, Vacuum Grease, Fast Quantitative Filter Paper and Vacuum Pump

Configuration	
Optional Parts	Sampling Blades, Vacuum Grease, Vacuum Pump Oil and Fast Quantitative Filter Paper
Note	The gas source port of the tester is a Φ6 mm PU tube. Gas sources and distilled water are to be prepared by the user.

✧ Labthink is always dedicated to the innovation and improvement of product performance and function. Therefore, technical specifications are subject to change without further notice. Labthink reserves the rights of revision and final interpretation.