PERME® C390 Water Vapor Transmission Rate Test System

C390 Water Vapor Transmission Rate Test System, is designed and manufactured based on infrared sensor method and conforms to the requirements of ISO 15106-2/ASTM F1249. This instrument can be used to measure the water vapor transmission rate of barrier materials with high, medium and lower moisture barrier properties with a wide testing range and high testing efficiency. The instrument is featured with patented design of integrated block consisting of 3 test cells. Equipped with high precision sensors and professional computer-controlled system, the instrument can regulate and control the temperature, humidity and flow rate properly, which guarantee the testing sensitivity and repeatability of test results. C390 is applicable to determination of water vapor permeability of plastic films, sheeting, paper, packages and other relative packaging materials in food, pharmaceutical, medical apparatus, daily chemical, photovoltaic and electronic industries, etc.

Product Features Note3

Innovative Sensor Technology

The instrument uses Labthink's new generation water vapor analytical sensor, which is developed by Labthink Global Research & Development Center, collecting top class scientific and technical achievements in Chinese and American sensor technology fields. With core sensor technology, the precision and stability reach world advanced level.

Best Products Created by Mature Process

With 30 years' experience, Labthink has most mature and reliable manufacturing technology of water vapor permeability testing instruments. Labthink provides customers with high-end barrier property testing instruments with best design, best material, best performance and best sensor by continuously adjusting the details, completing the designs and improving the performance.

Complete Product Line for Various Standards

By studying various test methods of water vapor transmission rate, Labthink manufactures many water vapor permeability testing instruments based on ASTM E96/GB 1037 (gravimetric method), ISO 15106-2/ASTM F1249 (infrared sensor method), ISO15106-3 (electrolytic sensor method) and ISO15106-1/ASTME398 (humidity sensor method). Labthink has the most complete product line of water vapor permeability testing instruments in packaging industry worldwide.

All for Customers

Labthink is dedicated to providing customers with suitable products. From scientific tracing method to commercially applied method, from scientific research to quality control, you will finally find the products that are suitable for you. C390M Water Vapor Transmission Rate Test System is one of those products.

- Precise adjustment of temperature, humidity and flow rate of test gas[Note3]
- Short warm-up time. Test conditions can be achieved in a very short period
- Liquid cooling agent, catalyst or special mixture of gases are not needed
- Professional test mode and fast test mode can meet requirements for different applications or materials
- Reference films are available for system calibration use
- Core sensors and other key parts have self-protection features
- The instrument is equipped with internal computer, requiring no external computer
- Package testing is supported
- Intelligent gas saving feature can help reduce the consumption of test gas
- Net connection and USB ports are available
- Professional software is easy to use. Multiple levels are defined for users. Various forms of reports.
- Labthink exclusive DataShield™ [Note2] provides the users with safe and reliable management of test data and test reports.
- Computer system required by China GMP is available for medical industry.
- CFR21 PART11

Test Principle

The test specimen is mounted in the diffusion cell, which is subsequently divided into a dry chamber and a controlled-humidity chamber. The dry side of the specimen is swept by a flow of dry nitrogen, and the water vapor permeating through the specimen from the controlled-humidity chamber is carried by dry nitrogen to the infrared sensor where proportion electrical signals will be generated. The water vapor transmission rate is obtained by analyzing and calculating the electrical signals. For package specimen, the dry nitrogen flow inside the specimen while the outside of specimen is in high humidity environment.

Test Standards[Note3]

This test instrument conforms to the following standards:

ISO 15106-2, ASTM F1249, GB/T 26253, JIS K7129, YBB 00092003-2015

Applications[Note3]

This instrument is applicable to the determination of water vapor transmission rate of:

Basic Applications	**Films**	Including plastic films, plastic composite films, paper-plastic composite films, geomembranes, coextruded films, aluminized films, aluminum foil, aluminum composite films, glass fiber paper composite films and many other film materials
	Sheeting	Including PP, PVC, PVDC, metal foil, film and silicon wafers
	Paper and Paper Board	Including paper and paper board e.g. tobacco packaging paper, paper plastic composite film

	Packages	Plastic, rubber, paper, paper-plastic composite, glass and metal packages, e.g. Coke bottles, peanut oil packages, Tetra Pak materials, vacuum bags, metal three-piece cans, plastic packages for cosmetic, soft tubes for toothpaste, jelly and yogurt cups
Extended Applications	**Package Caps**	Test water vapor permeability of different package caps against water vapor
	Solar Back-sheets	Including solar back-sheets and related packaging material
	LCD Monitor	Including LCD monitor and films used for LCD monitor
	Pipes	Including various pipes e.g. PPR pipes
	Blister Pack	Test water vapor permeability of blister pack
	Aseptic Wound Protection Films	Including aseptic wound protecting films, and protective clothing materials
	Battery Plastic Shell	Test the water vapor permeability of battery plastic cell

Technical Specifications

Table 1: Test Parameters[Note1]

Parameter \ Model		**C390M**
Test Range	g/(m²·d) (Standard)	0.05 ~ 40
	g/(pkg·d) (Package)	0.00025 ~ 0.2
Resolution	g/(m²·d)	0.001
Repeatability	g/(m²·d)	Bigger one of 0.05 and 2%
Test Temperature	℃	10 ~ 55 ±0.2
Test Humidity	RH	5% ~ 90% ±1%, 100%
Additional Functions	Package Test (3L Max.)	Optional
	DataShield™ Note2	Optional
	Computer System required by GMP	Optional
	CFR21 Part11	Optional

Table 2: Technical Specifications

Test Chamber	3 test chambers
Specimen Size	108mm×108mm
Specimen Thickness	≤3mm

Standard Test Area	50cm^2
Carrier Gas	99.999% High-purity Nitrogen (outside of supply scope)
Carrier Gas Pressure	≥0.28MPa/40.6psi
Port Size	1/8 inch metal tubing

Note 1: The parameters in the table are measured by professional operator in Labthink laboratory according to relative requirements for laboratory standard conditions.

Note 2: DataShield™ provides safe and reliable data application support. Multiple Labthink instruments can share one single DataShield™ system which can be purchase as required.

Note3: The described product features and test standards should be in line with Table 1: Test Parameters.

Please Note: 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 final interpretation and revision.