C301H Water Vapor Transmission Rate Test System

C301H Water Vapor Transmission Rate Test System is based on the test principle of infrared water sensor, designed and manufactured according to ASTM F1249, ISO 15106-2, etc., providing high precision and high efficiency water vapor transmission rate test for high and medium barrier materials. It is suitable for the water vapor transmission performance tests of film, containers, sheet and related materials in the fields of pharmaceutical, food, medical devices, daily chemistry, photovoltaic, electronics, etc.

Product Characteristics [Note 1]

Infrared Moisture Sensor

- Labthink patented infrared moisture sensor achieving a lower test limit.
- Designed according to ASTM F1249.
- Super-long service life, non-consumption type.
- Equipped with over-limit alarm and automatic protection function.

Precise Data

- Using 360° airflow circulation constant temperature technology with better temperature stability.
- Automatic control of carrier gas flow and temperature in the test process with higher accuracy.
- Using universal humidity generating principle of NIST with constant humidity.
- Equipped with imported high-precision temperature and humidity sensors as well as control system for real-time monitoring and recording of temperature and humidity changes.
- Labthink independently developed gas purification device can remove trace moisture in nitrogen and provide dry carrier gas. (Optional)
- The system can achieve a higher test repeatability of 0.005 g / (m^2·day).

Dual-Testing for Film & Containers

- In the same test cabinet, film and container are tested respectively to ensure a consistent test environment.
- New patented dual-function test cell for quick switching between functions.

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- Automatic translation technology of test cell with widened operating spaces.
- Automatic clamping saves time and labor; clamping strength is consistent with better sealing and with no safety risk.

Smart Control

- Color industrial-grade touching screen and desktop operating system, simple and convenient.
- Fully automatic testing and data saving with no manual intervention.
- The system is equipped with various sensors for intelligent reminding and safer control.
- Built-in calendar, multi-language switch and multi-level authority management, etc.
- Can be connected to a needle micro printer for the output of test results with long-term storage. (Optional)
- The system is embedded with network port, convenient for external access, data transmission and remote upgrading.

Multi-System Connectable

- New generation platform computer software. (Optional)
- One computer can be interconnected to multiple system mainframes.
- The software can independently control each mainframe, and the test data is centrally managed by the platform.
- The software displays real-time water vapor transmission rate curve, water vapor transmission rate coefficient curve, temperature curve and humidity curve.
- Professional test mode provides flexible and rich control functions to meet the needs of scientific research.
- The system meets the requirements of GMP for data traceability and meets the needs of the pharmaceutical industry. (Optional)
- DataShield™ Data Shield System is convenient for centralized data management and connecting information system. (Optional)

Low-Carbon & Energy-Saving

- Intelligent frequency conversion control technology makes the system operate with low power consumption.
- Test can be completed without computer.
- No need for a professional constant temperature laboratory while stable test data can be obtained as well as costs of laboratory construction and daily energy consumption can be reduced.
- Select world famous brand low energy consumption components for stable and reliable performance.

Test Principle

The prepared sample is clamped between the test chambers. Nitrogen with stable relative humidity flows on one side of the film, and dry nitrogen flows on the other side of the film. Due to the humidity difference, water vapor diffuses through the film to the low humidity side from the high humidity side. On the low humidity side, the water vapor is carried by the flowing dry nitrogen to the infrared moisture sensor, and different water vapor concentrations generates different light signals. By analysis and calculation, the concentration value can be obtained and water vapor transmission rate of the sample can be further determined.

Reference Standards [Note 1]

ASTM F1249, ISO 15106-2, GB/T 26253, GB/T 31355, JIS K7129, YBB00092003

Test Applications [Note 1]

Basic Applications	**Film**	Water vapor transmission rate tests of various plastic film, plastic composite film, paper-plastic composite film, co-extrusion film, aluminum-plated film, aluminum foil composite film, glass fiber aluminum foil composite film and other film materials.
	Containers	Water vapor transmission rate tests of pharmaceutical packaging, wine bottles, coke bottles, peanut oil barrels, Tetra Pak packaging, vacuum pouches, three-piece cans, cosmetics packaging, toothpaste hose, jelly cups and yogurt cups and other bottles, pouches, cans, boxes and barrels that are made of plastics, rubber, paper, plastic composite, glass, metal, etc.

	Sheet	Water vapor transmission rate test of PP sheet, PVC sheet, PVDC sheet, metal foil sheet, rubber sheet and silicon sheet materials.
Extensive Application	**Container Closure**	Water vapor transmission performance tests of various container closures.
	LCD	Water vapor transmission performance tests of LCD display screen and related diaphragm plate.
	Solar Back Panel	Water vapor transmission performance tests of solar back panel and related materials.
	Tubing	Water vapor transmission performance tests of PPR pipe and pipes of other materials.
	Pharmaceutical Blister Packaging	integral water vapor transmission performance tests of pharmaceutical blisters.
	Sterile Protective Film and Medical Plaster	Water vapor transmission performance tests of sterile protective film, medical plaster patch, etc.
	Battery Covers & Separators	Water vapor transmission performance of battery covers and separators.

Technical Parameters

Table 1: Test Parameters [Note 2]

Parameter \ Model		**C301H**
Test Specifications	**g/(m²·Day) (Standard area is 50cm²)**	0.005～50
	g / (pkg·day) (Container)	0.00002～0.25
	g/(m²·Day) (MASK area is 5cm²)	0.2~500 (Optional)
Resolution Ratio	**g/(m²·day)**	0.0001
Repeatability	**g/(m²·day)**	0.005 or 2%, take the larger one
Temp. Range	**℃**	15～50

Temp. Fluctuation	**℃**	±0.2
Humidity Range	**%RH**	0%, 35-90% ± 2% (standard) 100% (optional)
Expandable Functions	**GP-02 Gas Purification Device**	Optional
	DataShield™ Data Shield Note 3	Optional
	GMP Computer System Requirements	Optional
	CFR21Part11	Optional

Table 2: Technical Specifications

Test Cells	1 set for film + 1 set for containers
Sample Size	4.2” x 4.2”（10.6cm×10.6cm）
Sample Thickness	≤120 Mil （3mm）
Container Size	≤Φ 100 mm 250mm; Φ15mm ≤ bottle mouth≤ Φ65mm
Test Area	50cm^2
Carrier Gas Specification	99.999% high purity nitrogen (Gas source is provided by the user)
Gas Source Pressure	≥ 40.6 PSI / 280 KPa
Port Size	1/8" metal pipe
Dimensions	26.7” H x 14.9” W x 22.8” D (68cm× 38cm× 58cm)
Power	120VAC ± 10% 60Hz / 220VAC ± 10% 50Hz (alternative)
Net Weight	150Lbs （68kg）

Table 3: Product Configuration

Standard Configuration	Mainframe, sampler, vacuum grease, Φ4 mm polyurethane tube
Optional Parts	Software, computer, GMP computer system requirements, CFR21Part11, air compressor, GP-02, DataShield™ Data Shield Note 3
Notes	The compressed air inlet of this system is Φ4 mm polyurethane tube (pressure 79.7 PSI / 550 KPa); the air source is provided by the users themselves.

Note 1: The described product characteristics are subject to the specific annotation in the "Technical Parameters".

Note 2: The parameters in the table are measured in Labthink laboratory by professional operators according to the requirements and conditions of relevant laboratory environmental standards.

Note 3: DataShield™ Data Shield System provides safe and reliable data application support, which can be shared by multiple Labthink products. Please purchase separately according to the usage situation.

✧ Labthink is always committed to the innovation and improvement of product performance and functions. For this reason, the product technical specifications will change accordingly. The above situation will not be notified separately. The company reserves the right to modify and final interpretation.