

C201H Oxygen Transmission Rate Test System is developed based on the Coulometric oxygen analysis sensor and equal pressure method test principle. It is designed and manufactured according to ASTM D3985 and other standards to provide high precision and high efficiency oxygen transmission rate tests for high and medium gas barrier materials. It is suitable for oxygen permeability performance tests of film, containers, sheet and related materials in pharmaceutical, food, medical devices, daily chemistry, photovoltaic, electronics and other fields.

## Product Characteristics <sup>Note 1</sup>

### Coulometric Oxygen Sensor

- Equipped with Labthink new technology achievement - ppb class coulometric oxygen sensor to achieve lower test limit.
- Conforming to ASTM D3985 with absolute value and no need for calibration.
- Super long service life - three times that of the traditional coulometric oxygen sensor.
- 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 test process with higher accuracy.
- Using the universal humidity generating principle of NIST with constant humidity.
- Equipped with imported high-precision temperature and humidity sensors as well as control system with real-time monitoring of temperature and humidity changes.
- Labthink independently developed gas purification device can remove trace oxygen from nitrogen and provide anaerobic carrier gas (Optional).
- The system can achieve a higher test repeatability of 0.01 cc/(m<sup>2</sup>·day).

### Dual-Testing for Film & Container

- 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.
- Automatic translation technology of test cell and the operating space is widened.
- Automatic clamping saves time and labor; clamping strength is consistent with better sealing and 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, multi-level authority management and other functions.
- Can be connected to needle micro printer for the output of test results, and the results can be stored for a long time (optional).
- The system is embedded network port, which is convenient for external access, data transmission and remote upgrading.

### **Multi-mainframe 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.
- Software displays real time oxygen transmission curve, oxygen transmission coefficient curve, temperature curve and humidity curve.
- Professional test mode provides flexible and rich control functions to meet the needs for scientific research.
- It 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.
- The system can test independently without computer.
- No need for professional constant temperature laboratory while stable test data can be obtained and costs of laboratory construction and daily energy consumption can be reduced.

- Select world famous brand low energy consumption components with stable and reliable performances.

## Test Principle

Prepared sample is clamped between the test chambers. Oxygen or air flows on one side of the film, and high pure nitrogen flows on the other side of the film. Oxygen molecule diffuses through the film to the other side with high purity nitrogen and is carried by the flowing nitrogen to the sensor. By analyzing the oxygen concentration measured by the sensor, oxygen transmission rate and other results can be calculated.

## Reference Standards <sup>Note 1</sup>

ASTM D3985, ASTM F1307, GB/T 19789, GB/T 31354, DIN 53380-3, JIS K7126-2-B, YBB 00082003

## Test Applications <sup>Note 1</sup>

<b>Basic Applications</b>	<b>Films</b>	Oxygen transmission rate tests of various film, paper-plastic composite film, co-extrusion film, aluminum-plated film, aluminum foil composite film and glass fiber aluminum foil composite film, .etc.
	<b>Containers</b>	Oxygen transmission rate tests of bottles, pouches, cans, boxes and barrels of plastic, rubber, paper, paper-plastic composite, glass and metal, such as pharmaceutical packaging, wine bottles, coke bottles, Tetra Pak packaging, vacuum bags, three-piece cans, cosmetic packaging, toothpaste hose, jelly cups, yogurt cups.
	<b>Sheet</b>	Oxygen transmission rate tests of PP, PVC, PVDC, metal foil, rubber, silicon, etc.
<b>Extensive Applications</b>	<b>Packaging Closure</b>	Oxygen transmission performance tests of various packaging closures.
	<b>Solar Backpanel</b>	Oxygen transmission performance tests of solar backpanel.
	<b>Tubing</b>	Oxygen transmission performance tests of PPR tube and other materials.
	<b>Pharmaceutical Blister</b>	Overall oxygen transmission performance tests of medical blister systems.
	<b>Car Fuel Tank</b>	Oxygen transmission performance tests of plastic fuel tank.
	<b>Battery Cover &amp; Separator</b>	Oxygen transmission performance test of battery covers and separators.

## Technical Parameters

Table 1: Test Parameters <sup>Note 2</sup>

	Parameter \ Model	C201H
Test Specifications	cc/(m <sup>2</sup> ·Day) (Standard area is 50cm <sup>2</sup> )	0.01~200
	cc/(pkg·day) (Containers)	0.00005~1
	cc/(m <sup>2</sup> ·day) (MASK area is 5cm <sup>2</sup> )	0.2~2000 (Optional)
Resolution Ratio	cc/(m <sup>2</sup> ·day)	0.0001
Repeatability	cc/(m <sup>2</sup> ·day)	0.01 or 1%, take the larger one
Temp. Range	°C	15~50
Temp. Fluctuation	°C	±0.2
Humidity Range	%RH	0%, 35-90% ± 2% (Standard) 100% (Optional)
Expandable Functions	GP-02 Gas Purification Device	Optional
	DataShield™ Data Shield <sup>Note 3</sup>	Optional
	The GMP Computer System Requirements	Optional
	CFR21Part11	Optional

Table 2: Technical Specifications

Test Cell	1 set for films + 1 set for containers
Film Size	4.2" x 4.2" (10.6cm×10.6cm)
Film Thickness	≤120 Mil (3mm)
Container Size	≤Φ 100 mm x 250mm; Φ15mm ≤ bottle mouth ≤ Φ 65mm
Test Area	50cm <sup>2</sup>
Gas Specifications	99.999% nitrogen, 99.5% oxygen (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, Φ 4 mm polyurethane tube
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<b>Optional Parts</b>	Software, computer, GMP computer system requirements, CFR21Part11, air compressor, GP-02, DataShield™ Data Shield <sup>Note 3</sup>
<b>Notes</b>	The compressed air inlet of this system is $\Phi 4$ mm polyurethane tube (pressure 79.7 PSI / 550 KPa); the air source is provided by the user.

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**Note 1: The described product characteristics are subject to the specific annotation of 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 the relevant laboratory environment 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.