

C230M (2019) Oxygen Transmission Rate Test System

C230M Oxygen Transmission Rate Test System is designed and manufactured based on the coulometric sensor method (aka. equal pressure method) and conforms to ASTM D3985, ASTM F2622 and ISO 15105-2. This instrument can be used to measure the oxygen transmission rate of barrier materials with high, and medium barrier properties with high accuracy and high efficiency. The instrument features Labthink's patented design of integrated test block consisting of three permeation cells. Equipped with a high precision coulometric sensor and Labthink's professional computer-controlled system, the instrument can regulate and control the temperature, humidity and flow rate precisely, guaranteeing high sensitivity and excellent repeatability of test results. C230M is applicable to the determination of oxygen permeability of plastic films, sheeting, paper, and other packaging materials used in food, pharmaceutical, medical apparatus, consumer products, photovoltaic and electronic industries, etc. Optional accessories extend the capability to testing complete packages and systems such as bottles, pouches, cartons, blister packs, tubes and more.



High Precision

- Patented integrated test block with advanced hydrodynamic and thermodynamic designs.
- Labthink's proprietary thermostat technology ensures that the test block is precisely temperature controlled and remains stable throughout the test.
- Temperature and humidity sensor for independent monitoring of test cells.

High Efficiency

- Three identical specimens can be tested simultaneously, which meets the requirements for parallel test.
- Three distinct specimens can be tested under the same testing condition, delivering higher throughput while reducing the number of instruments required.

Labor Saving

- Automatic temperature and humidity control eliminate the need for operator monitoring and adjustment.
- Automatic flow rate control ensures constant flow during the testing process and minimizes any errors caused by an unstable flow rate.
- No need to verify the system using different reference film for different testing range.

Simplified Operation

- 12" touch-screen pad powered by Windows™ 10 operating system
- Fast automatic testing process
- Optional DataShield™ software and accessories for automatic data management

Product Features^{Note3}

- **New Generation Integrated Testing Block**

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The patented three-cell integrated test block structure using advanced thermodynamics and hydrodynamics analysis greatly improves the temperature, humidity and flow measurement accuracy across the three test cells and supports simultaneous testing of three samples.

- **Automatic Control of Temperature, Humidity and Flow Rate**

The internal temperature and humidity of the instrument are automatically adjusted with temperature and humidity sensors, maintaining the stability of the test specimen environment.

Automatic flow rate control ensures constant flow during the testing process and minimizes any errors caused by an unstable flow rate.

- **Easy-to-use and High-efficiency System**

The automatic test mode, combined with the instrument features, eliminates the need for manual adjustments to quickly obtain accurate results, saving training costs and releasing staff from manual monitoring so that they are available for other tasks.

The professional test mode provides flexible and rich instrument control functions to meet individual scientific research needs.

Unique, optional DataShield™ system, meets the requirements for centralized management of user data. It supports a variety of formats of exported data. Reliable security algorithms are used to prevent data leakage. It supports universal wired and wireless LAN, optional private wireless network and third-party software.

- **User-oriented Service Concept**

Adhering to our user-oriented service concept, Labthink has created a customization system that provides flexible and comprehensive customization services for the accommodation of non-standard specimens and packages.

Test Principle

The pre-conditioned specimen is mounted between the upper and lower chambers at ambient atmospheric pressure. The upper chamber contains oxygen or air and the lower chamber is slowly purged by a stream of nitrogen. Due to the concentration difference between the two chambers, oxygen molecules permeate through the specimen into the nitrogen side and are taken to the coulometric sensor where proportional electrical signals are generated. The oxygen transmission rate is then obtained by analyzing the signals and calculating the volume of oxygen measured by the sensor. For whole package samples, high purity nitrogen flows inside the package and oxygen or air flows outside.

Test Standards

ISO 15105-2, ASTM D3985, ASTM F2622, ASTM F1307, ASTM F1927, DIN 53380-3, GB/T 19789, GB/T 31354, JIS K7126-B, YBB 00082003-2015

Applications ^{Note3}

Basic Applications	Films	Plastic films, paper-plastic composite films, coextruded films, metalized films, aluminum foils, aluminum foil composite films, glass fiber aluminum foil composite films and many others.
	Sheeting	PP, PVC and PVDC sheets, metal foils, rubber pads, silicon wafers and other sheeting materials.
	Packages	Plastic, rubber, paper, paper-plastic composite, glass and metal packages, e.g. plastic bottles, pouches, coated paper cartons, vacuum bags, metal three-piece cans, plastic packages for cosmetics, soft tubes for toothpaste, jelly and yogurt cups.
Extended Applications	Closure Systems	Oxygen barrier property of various closure systems for bottles cartons and pouches.
	Solar Back-Sheets	Oxygen permeability test of solar back-sheets.
	Plastic Tubes	Oxygen permeability test of various sorts of tubes, e.g. cosmetic tubes.
	Blister Packs	Oxygen transmission rate of whole blister packs.
	Automotive and Small Engine Fuel Tanks.	Permeability of plastic fuel tanks.
	Battery Plastic Shell	Oxygen transmission rate of battery plastic shell

Technical Specifications

Table 1: Test Parameters^{Note1}

Parameter		Model C230M
Test Range	cm ³ /(m ² ·day) (Standard)	0.01~5000
	cc/(100in ² ·day)	0.0007~322
	cm ³ /(pkg·day) (Package)	0.00005~25
Resolution	cm ³ /(m ² ·day)	0.001
Repeatability	cm ³ /(m ² ·day)	0.01 or 2% (Choose the bigger value)
Test Temperature	°C	10~55 ±0.2
Test Humidity	RH	0%, 5% ~ 90% ± 1%, 100%
Additional Functions	Package Test (3L Max.)	Option
	DataShield TM Note2	Option
	Computer System required by GMP	Option
	CFR21 Part11	Option

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 operators in Labthink laboratory under strictly controlled laboratory conditions.

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

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

Please Note: Labthink is dedicated to the innovation and improvement of product performance and function. Therefore, technical specifications are subject to change without notice. Labthink reserves the right of final interpretation and revision.