PERME® CLASSIC 230 Oxygen Transmission Rate Tester

CLASSIC 230 Oxygen Transmission Rate Tester is a professional, high efficiency and intelligent OTR test system which can be used to measure the oxygen transmission rate of plastic films, high barrier materials, solar back-sheets, composite materials, aluminized films, co-extruded films, aluminum foils, sheeting as well as bottles, bags, cans and boxes made of plastics, rubber, paper and metals, etc.

Professional

The instrument uses high precision trace oxygen transmitter with Labthink's exclusive core control technology which can insulate external interference and reduce signal attenuation so that the instrument can test oxygen in a wide test range with high resolution and sensitivity. The instrument supports multiple test modes, which can be used to test materials with high, medium and low barrier properties.

- Wide range and high performance humidity control device guarantee precise test humidity Note 2
- Senior test mode can meet the specific testing requirements of different users
- Standard, proportional and continuous test modes facilitate the common users with various simplified test methods
- The core of trace oxygen transmitter is featured with magnetic protection so that the trace signal can be obtained more precisely
- The core of trace oxygen transmitter is featured with self-maintenance function, which can lower the core attenuation rate, extend the maintenance interval and save the usage cost

High Efficiency

The instrument is based on the equal pressure method and adopts Labthink's second generation patent design of three diffusion cells integrated in one instrument, which improves the test resolution, repeatability and performance in temperature and humidity control.

- Labthink's exclusive design of three diffusion cells integrated in one instrument ensures that all tests are performed in same test conditions
- Tests can be performed in three test cells independently which provides test efficiency and flexibility
- Multiple satellite bases (optional) can be connected to the instrument so that more specimen tests can be performed simultaneously Note4
- Reference films (optional) are available for system calibration, which guarantees the accuracy and universality of test data

Intelligent

The instrument is embedded with Labthink's latest operating software, which is featured with user-friendly interface, intelligent data processing, strict user management and secure data storage. It also supports Labthink exclusive DataShield™ Note5 (Optional) which provides the users with safe and reliable management of test data and test reports.

- Test data can be displayed in various forms including curves and data list
- Test data will be saved and encrypted in a unique way so that all the test information will be saved securely and reliably and protected from being tampered
- Various forms of test data can be searched, exported and printed out
- The instrument meet the requirements of China's Good Manufacturing Practice (GMP) for computer system, which can be used in medical industry (optional configuration)
- The user privilege can be self-defined so that the operation of users with different privileges can be controlled (Optional configuration)
- Multiple password authentication protection mechanism facilitates the users with a safer operating environment (Optional configuration)
- Key operations will be automatically recorded and the records can be searched in various ways, which provide reliable evidence for audit trials (Optional configuration)

Test Principle

The pre-conditioned specimen is mounted between the upper and lower chambers at ambient atmospheric pressure. One chamber contains oxygen or air and the other 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 and calculating the signals. For package samples, high purity nitrogen flows inside the package, and oxygen or air flows outside.

Test Standards Note2

ISO 15105-2, ASTM D3985, ASTM F2622, ASTM F1307, ASTM F1927, JIS K7126-B, YBB 00082003-2015, GB/T 19789, GB/T 31354
Software Requirements of China's Good Manufacturing Practice (Optional)

Applications Note2

Basic Applications	**Films**	Including plastic films, plastic composite films, paper-plastic composite films, coextruded films, aluminized films, aluminum foils, aluminum foil composite films and many others
	Sheeting	Including various sorts of engineering plastics, rubber and building materials, e.g. PP, PVC and PVDC
	Packages	Including 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 seal performance of different package caps

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Solar Back-Sheets	Including solar back-sheets
Plastic Pipes	Including various sorts of pipes, e.g. PPR
Blister Packs	Test oxygen transmission rate of the whole blister packs
Contact Lens	Test oxygen transmission rate of contact lens under service condition
Fuel Tanks of Cars	Plastic fuel tanks are widely used in cars for its light weight, buffering vibration and easy molding characters. But its fuel permeability is the most essential factor, this instrument can be used to test permeability of plastic fuel tanks
Battery Plastic Shell	Battery electrolyte is protected by the plastic shell from outside environment. Battery service life is directly dependent on its oxygen permeability. This instrument can be used to test oxygen transmission rate of battery plastic shell

Technical Specifications

Table 1: Test Parameters[Note1]

Parameter \ Model		230B	230M	230H	230G	230X
Test Range	$cm^3/(m^2 \cdot d)$ (50cm^2)	0.5-6500	0.3-5000	0.1-5000	0.05-3000	0.02-1000
	$cm^3/(m^2 \cdot d)$ (7cm^2)	3.5-45000	2.1-35000	0.7-35000	0.35-21000	0.14-7000
	$cm^3/(pkg \cdot d)$ (Package)	N/A	N/A	0.0005-25	0.0003-15	0.0001-5
Resolution	$cm^3/(m^2 \cdot d)$	0.01	0.01	0.01	0.01	0.01
Repeatability	$cm^3/(m^2 \cdot d)$	Bigger one of ±0.5 and 3%	Bigger one of ±0.3 and 3%	Bigger one of ±0.1 and 2%	Bigger one of ±0.05 and 2%	Bigger one of ±0.02 and 2%
Test Temperature	℃	15-45	15-45	10-55	10-55	10-55
Accuracy	℃	±0.5	±0.5	±0.2	±0.2	±0.1
Test Humidity	RH	N/A	N/A	0%-90%	0%-90%	0%-90%
Accuracy	RH	N/A	N/A	±2%	±2%	±2%
Additional Functions	Humidity Control Device	N/A	N/A	Standard	Standard	Standard
	Satellite Base[Note4]	N/A	N/A	Standard	Standard	Standard
	Package Test (3L Max.)	N/A	N/A	Optional	Optional	Optional
	DataShield™ [Note5]	N/A	Optional	Optional	Optional	Optional
	Computer System Required by GMP	N/A	Optional	Optional	Optional	Optional

Table 2: Technical Specifications

Test Chamber	3 test chambers with independent pipe system, which supports tests with different test parameters and provides independent test data[Note3]
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

Configurations [Note2]

Standard Configurations	Instrument, Computer, Professional Software, Communication Cable, Vacuum Grease, Diamond Sample Template, Hole Puncher, Sample Cutter, Valve Sets
Optional Configuration	Satellite Base, Accessories for Package Test, Temperature Control Device for Package Test (TC05), Humidity Control Device (HG06), Test Accessories for Contact Lens, Reference Film, DataShield™ [Note5]

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

Note 3: The described test parameters do not include test temperature and test humidity.

Note 4: The instrument has such software function but the satellite base shall be purchased separately.

Note 5: DataShield™ provides safe and reliable data application support. Multiple Labthink instruments can share one single DataShield™ system which can be purchase as required.

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.

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