TECHLABSYSTEMS

OTR-O1 Oxygen Transmission Rate Tester

(Coulometric sensor method)

OTR-O1 Oxygen Transmission Rate Tester, also called oxygen permeability Tester is designed and manufactured based on the coulometric sensor method (as known as equal pressure method) and conforms to ASTM D3985. The instrument has a patented integrated single test permeation cells, high-precision sensors, and built-in dedicated computer control system, providing accurate temperature, humidity, flow rate adjustment and control, with high test sensitivity and excellent repeatability of test results. OTR-O1 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.

Technical Features

High Precision Advantages

- Trace oxygen sensor, can measure oxygen content as low as ppb level; pA level micro current measurement, higher measurement accuracy
- Precise flow control, with professional piping system and flushing technology, effectively ensure the stability and cleanliness of the carrier gas
- Advanced sample installation anti-leakage technology to effectively ensure the overall sealing of the test chamber
- Equipped with patented non-fog humidifier, automatic and precise control of high humidity

- Semiconductor cold and hot bidirectional temperature control technology, which can increase or decrease temperature at will, with precise temperature control, making the system more stable;
- Core sensors and other components have multiple self-protection functions
- Short warm-up time, test conditions can reach the set requirements faster

Efficient and Intelligent

- Whole process monitoring, automatic recording, adjustable sampling rate, test process can be reproduced throughout
- The software functions are professional and intuitive, personnel permissions are strictly graded, and report output forms are diverse
- Intelligent air-saving function can reduce the consumption of test gas
- Optional accessories extend the capability to testing containers
- The system is controlled by a microcomputer, equipped with a tablet and a menu-type interface, which is convenient for users to quickly and intuitively view the test data and results
- Equipped with RS232 data interface and computer software to facilitate data transfer
- The software complies with the requirements of China's "Good Manufacturing Practice for Pharmaceutical Products" (GMP)

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.

Applications

Basic Application	Films	Plastic films, paper-plastic composite films, coextruded films, aluminized 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. 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 Application	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	Test oxygen transmission rate of the 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

Specifications	OTR-O1
Test Range (film)	0.01 ~ 6500 (cc/㎡.24h) (Container test accessories optional)
Resolution	0.001
Permeable Area	50 cm^2 (Customizable)
Specimen Thickness	≤3 mm
Number of Specimens	1
Number of Sensor	1
Temperature Control Range	5℃ ~ 95℃ (Temperature control device is optional)
Temperature Accuracy	±0.1℃
Carrier Gas	99.999% High-purity Nitrogen (outside of supply scope)
Carrier Gas Flow	0 ~ 100 mL/min
Carrier Gas Pressure	≥0.2MPa
Port Size	1/8 inch metal tubing
Instrument Dimension	740mm (L)×415 mm (W)×430mm (H)
Power Supply	AC 220V 50Hz
Net Weight	50Kg

Standards

ASTM D3985, ASTM F2622, ASTM F1307, ASTM F1927, ISO 15105-2, JIS K7126-B, YBB 00082003, GB/T 19789

Configuration

Standard configuration: Instrument, Vacuum grease, Sampler, Calibration film, Nitrogen/Oxygen pressure regulator

Optional configuration: Container test accessories, Container test temperature and humidity controller, Air Compressor

Note: Nitrogen and Oxygen are prepared by customer.