

## OTR-O3 Oxygen Permeability Tester

### Brief Introduction

OTR-O3 Oxygen Permeability Tester, also called oxygen Transmission Rate Tester is designed and manufactured based on the coulometric sensor method (as known as equal pressure method) and conforms to ASTM D3985. 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 has a patented integrated three 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-O3 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

- ◆ The three permeation cells are completely independent, and can test three identical specimens or distinct specimens simultaneously
- ◆ 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, fully 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

- ◆ The system is controlled by a microcomputer, equipped with a tablet computer and a menu-type interface, which is convenient for users to quickly and intuitively view the test data and results
- ◆ 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
- ◆ Equipped with RS232 data interface and computer software to facilitate data transfer

### 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

<b>Basic Applications</b>	<b>Films</b>	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
	<b>Sheeting</b>	PP, PVC and PVDC sheets, metal foils, rubber pads, silicon wafers and other sheeting materials
	<b>Packages</b>	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
<b>Extended Applications</b>	<b>Closure Systems</b>	Oxygen barrier property of various closure systems for bottles cartons and pouches
	<b>Solar Back-Sheets</b>	Oxygen permeability test of solar back-sheets
	<b>Plastic Tubes</b>	Oxygen permeability test of various sorts of tubes, e.g cosmetic tubes
	<b>Blister Packs</b>	Test oxygen transmission rate of the whole blister packs
	<b>Automotive and Small Engine Fuel Tanks</b>	Permeability of plastic fuel tanks
	<b>Battery Plastic Shell</b>	Oxygen transmission rate of battery plastic shell

**Technical Specifications**

Item	OTR-O1	OTR-O3
<b>Test Range (film)</b>	0.01 ~ 6500 (cc/m <sup>2</sup> .24h)	
<b>Resolution</b>	0.001	
<b>Permeable Area</b>	50 c m <sup>2</sup> (Customizable)	
<b>Specimen Thickness</b>	≤3 mm	
<b>Number of Specimens</b>	1	3 (Data are independent)
<b>Number of Sensor</b>	1	3
<b>Temperature Control Range</b>	15℃ ~ 55℃ (Temperature control device is optional)	
<b>Temperature Accuracy</b>	±0.1℃	

<b>Carrier Gas</b>	99.999% High-purity Nitrogen (outside of supply scope)
<b>Carrier Gas Flow</b>	0 ~ 100 mL/min
<b>Carrier Gas Pressure</b>	≥0.2MPa
<b>Port Size</b>	1/8 inch metal tubing
<b>Instrument Dimension</b>	740 mm (L) x 415 mm (W) x 430 mm (H)
<b>Power Supply</b>	AC 220V 50Hz
<b>Net Weight</b>	50 kg

## Standards

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

*Technical specifications are subject to change without further notice. Please visit our website at [www.horizontester.com](http://www.horizontester.com) for latest information.*