

GRAVIMETRIC WATER VAPOR TRANSMISSION RATE TESTER (12-CELL)



Gravimetric Water Vapor Transmission Rate Tester (12-Cell) - ToronWVTR™ C12

Desiccant Cup WVTR Tester with 12 Independent Specimens

The ToronWVTR™ C12 is a 12-station gravimetric WVTR tester that measures the water vapor transmission rate of plastic films, aluminum foil, aluminized films, and composite laminates. The instrument uses the weighing method, a direct gravimetric technique that weighs the moisture crossing a barrier. Twelve stations test twelve specimens continuously, the highest throughput in the range for production QC and contract labs. Built around methods such as ASTM E96 and ISO 2528, it delivers standards-based moisture barrier data.

Automatic temperature and humidity control hold the 65 L chamber at a set condition across a 15°C to 60°C range, so every station runs to recognized test conditions. A precision balance weighs each dish on a schedule, and a 24-bit delta-sigma converter resolves small mass changes for high-barrier foils and metallized films. Controlled air velocity across the specimens keeps results repeatable across the full load.

One-button operation runs the full sequence automatically across all twelve stations, and live data curves let operators follow mass change, temperature, and humidity in real time. Traceable reference-film calibration keeps results defensible for audits and certification. The ToronWVTR™ C12 (Gravimetric 12-Cell Water Vapor Transmission Rate Tester) suits high-volume packaging, food, pharmaceutical, and contract-testing labs.

APPLICATIONS

Gravimetric Water Vapor Transmission Rate Tester (12-Cell) - ToronWVTR™ C12 Applications

The ToronWVTR™ C12 supports high-volume moisture barrier testing wherever water vapor ingress affects product quality, shelf life, or stability.

- **High-Volume Production QC:** runs large sample batches of films and laminates for plants and contract labs that release many samples per shift.
- **Contract and Third-Party Testing Labs:** supports high-throughput WVTR testing across many client materials and specifications at once.
- **Food and Beverage Packaging:** measures moisture ingress through films, foils, and laminates that protect dry and moisture-sensitive products.
- **Pharmaceutical and Medical Packaging:** verifies the moisture barrier of blister foils, sachets, and pouches for hygroscopic drug products.
- **Aluminum Foil and Metallized Materials:** measures very low moisture transmission where the gravimetric method performs well.
- **Composite and Laminated Films:** characterizes water vapor transmission of multilayer and aluminized structures at scale.
- **Paper, Board, and Coatings:** evaluates the moisture barrier of coated papers, boards, and organic coating films.
- **Building and Construction Materials:** tests the moisture barrier of membranes, coatings, and sheet materials per ASTM E96.



TORONTECH

ToronWVTR™ C12
Gravimetric Water Vapor
Transmission Rate Tester
(12-Cell)

Standards

The ToronWVTR™ C12 is designed to align with internationally recognized gravimetric test methods for water vapor transmission rate measurement.

- ISO 2528 - Sheet Materials: Determination of Water Vapour Transmission Rate (WVTR): Gravimetric (Dish) Method
- ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials
- ASTM D1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films
- DIN 53122-1 - Testing of Plastics and Elastomer Films, Paper, Board, and Other Sheet Materials: Determination of Water Vapour Transmission Rate: Part 1: Gravimetric Method
- JIS Z 0208 - Testing Methods for Determination of the Water Vapour Transmission Rate of Moisture-Proof Packaging Materials (Dish Method)
- TAPPI T464 - Water Vapor Transmission Rate of Sheet Materials at High Temperature and Humidity

FEATURES

Gravimetric Water Vapor Transmission Rate Tester (12-Cell) - ToronWVTR™ C12 Key Features

The ToronWVTR™ C12 pairs the gravimetric reference method with twelve-station throughput and automated conditioning.

- **Gravimetric Weighing Method:** a direct mass measurement of permeated moisture, the recognized reference approach for WVTR and high-barrier materials.
- **Twelve-Station Continuous Testing:** twelve independent specimens run together, the highest throughput in the range for production QC and contract labs.
- **Automated Precision Weighing:** scheduled automatic weighing of all twelve dishes removes the manual weighing errors of a traditional dish test.

- **Automatic Temperature and Humidity Control:** the large chamber holds a set condition without manual adjustment, so every station runs to the same standard condition.
- **Controlled Air Velocity:** adjustable airflow across the specimens keeps the boundary layer thin and results repeatable.
- **24-Bit Delta-Sigma Data Acquisition:** high-resolution conversion resolves the small mass changes produced by high-barrier foils and films.
- **One-Button Automated Testing:** a single command runs the complete sequence automatically across all stations, reducing operator effort and variability.
- **Real-Time Data Curves:** on-screen plots of mass change, temperature, and humidity let operators follow every station at a glance.
- **Built-In Ambient Monitoring:** an internal temperature and humidity sensor logs room conditions with every test for better traceability.
- **Multiple Test Modes:** selectable modes adapt the instrument to different materials and barrier levels.
- **Traceable Reference-Film Calibration:** calibration against certified reference films keeps results defensible for QC release and certification audits.
- **Laboratory Data Management Integration:** connects to lab data management software for centralized records, review, and reporting.

THEORY & METHOD

Theory and Method

Weighing-method WVTR testing measures how much moisture passes through a film by weighing a sealed dish assembly over time. Each specimen is clamped over a dish holding a desiccant, so the underside stays dry. The dishes sit in a chamber held at a controlled temperature and humidity, which sets up a water-vapor pressure gradient across each film: humid in the chamber, dry beneath the film.

Moisture permeates each film and is captured by its desiccant, so every dish gains weight over time. A precision balance weighs the dishes in turn at set intervals. The steady-state slope of weight against time for each specimen, divided by the exposed area, gives its WVTR in g/m²·24h, tied directly to the mass that crossed the film.

Because it weighs the moisture rather than reading a sensor, the gravimetric method serves as a primary reference, which helps method correlation and high-barrier foil work. Airflow across the specimens limits surface resistance so the film governs the rate. Twelve stations run together under automatic temperature and humidity control, which turns the reference method into a high-throughput tool for busy labs.

TECHNICAL SPECIFICATIONS

Gravimetric Water Vapor Transmission Rate Tester (12-Cell) -
ToronWVTR™ C12 Technical Specifications

Parameter	Specification
Measurement Range	0.1 to 19,000 g/m ² ·24h (standard)
Test Accuracy	0.01 g/m ² ·24h
Specimen Amount	12, independent
Temperature Range	15°C to 60°C
Temperature Accuracy	±0.1°C
Differential Humidity Range	Room to 95% RH (standard condition 90% RH)
Humidity Accuracy	±1% RH
Test Area	28.26 cm ²

Specimen Size	Ø76 mm
Air Velocity	0.5 to 2.5 m/s (customization available)
Test Chamber Volume	65 L
Gas Supply	Air
Gas Interface	Ø8 mm
Voltage	AC 220 V, 50 Hz (110V is also available)
Dimensions	885 mm (L) × 630 mm (W) × 450 mm (H)
Net Weight	120 kg

Standard Delivery

Item	Description
Main Unit	Twelve-station gravimetric WVTR test instrument
Computer	Dedicated control PC
Control Software	Instrument operation and data-analysis software
Test Dishes (12)	Gravimetric test dishes for the twelve stations
Desiccant Tube	Supplies desiccant for the dry side of each dish
Pressure Regulator	Regulates the air supply pressure
Automatic Moisture Filter	Conditions incoming air for stable humidity
Calibration Weight	Reference weight for balance calibration
Communication Cable	Connects the instrument to the control PC

Item	Description
Sample Cutter	Prepares specimens to the required test size

Optional Accessories

Item	Description
Reference Film	Certified film for traceable calibration
Air Drying Device	Additional air-drying for low-humidity test conditions
Sample Cutter	Additional specimen-preparation cutter
Laboratory Data Management System	Centralized data management and reporting software



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