

AIR PERMEABILITY TESTER



Air Permeability Tester - ToronAPT™ 5636

Automatic Gurley-Method Air Permeability and Air Resistance Tester

ToronAPT™ 5636 is an air permeability tester that measures the air permeability and air resistance of paper, nonwoven fabrics, textiles, battery separator membranes, and other porous materials. The instrument uses the standard Gurley method and runs the full test automatically, handling specimen clamping, pressure control, and result output. A touchscreen interface and a built-in micro-printer make it a self-contained benchtop unit. Results report in Gurley seconds and $\mu\text{m}/\text{Pa}\cdot\text{s}$ to suit different standards and industries.

Automatic test-pressure control sets and holds the differential pressure, with a standard 1.22 kPa Gurley setting and an adjustable range to 20 kPa for a wide span of materials. Interchangeable test heads of 1.0, 0.25, and 0.1 in² adapt the instrument to different sample types and permeability levels. High-accuracy sensors and a real-time curve display support accurate, repeatable results.

The ToronAPT™ 5636 suits battery, paper, nonwoven, textile, and membrane labs that need standards-based air permeability data. Built-in data query and a traceable calibration routine keep records organized and defensible for QC and certification. The compact 20 kg unit fits limited bench space and needs only a compressed-air supply to run.

APPLICATIONS

Air Permeability Tester - ToronAPT™ 5636 Applications

The ToronAPT™ 5636 measures air permeability and air resistance across porous materials where breathability, porosity, or barrier behavior affects performance.

- Battery Separator Membranes: measures air permeability of lithium-ion and other battery separators, a key indicator of ionic transport and separator quality.
- Paper and Paperboard: tests air resistance and porosity of papers, tissue, and board by the Gurley method.
- Nonwoven Fabrics: measures air permeability of nonwovens used in hygiene, medical, and filtration products.
- Textiles and Apparel: evaluates the breathability and air permeability of woven and knitted fabrics.
- Heat-Exchange and Filtration Membranes: characterizes air transport through energy-recovery and filter membranes.
- Filter Media and Papers: qualifies filter papers and media by air resistance for consistent filtration performance.
- Cigarette and Specialty Papers: tests the porosity of tipping, plug-wrap, and specialty papers.
- Coated and Laminated Papers: verifies the air barrier of coated and laminated paper structures.



Standards

The ToronAPT™ 5636 is designed to align with internationally recognized standards for air permeability and air resistance testing by the Gurley method.

- ISO 5636-5 - Paper and Board: Determination of Air Permeance and Air Resistance (Medium Range): Part 5: Gurley Method
- ASTM D726 - Standard Test Method for Resistance of Nonporous Paper to Passage of Air
- TAPPI T460 - Air Resistance of Paper (Gurley Method)
- TAPPI T536 - Resistance of Paper to Passage of Air (High-Pressure Gurley Method)

FEATURES

Air Permeability Tester - ToronAPT™ 5636 Key Features

The ToronAPT™ 5636 combines automatic Gurley-method testing with a self-contained touchscreen benchtop design.

- Standard Gurley Method: measures air resistance and air permeability by the recognized Gurley method for paper, nonwovens, and membranes.
- Automatic Specimen Clamping: clamps each specimen automatically for consistent sealing and repeatable results.
- Automatic Test-Pressure Control: sets and holds the test pressure, with a standard 1.22 kPa Gurley setting and a wide adjustable range.
- Touchscreen Operation: an on-screen interface guides setup and testing without a connected PC.
- Real-Time Pressure and Curve Display: shows test pressure and the data curve live so operators follow each test.
- Multiple Output Units: reports results in Gurley seconds, $\mu\text{m}/\text{Pa}\cdot\text{s}$, and other selectable units for different standards and industries.

- Interchangeable Test Heads: optional 1.0, 0.25, and 0.1 in² heads adapt the instrument to different sample types and permeability ranges.
- Built-In Micro-Printer: prints test reports directly at the bench for quick record-keeping.
- Built-In Data Query: stores and recalls test records on the instrument for review.
- High-Accuracy Sensors: precise pressure and flow sensing supports accuracy and repeatability.
- Automatic Overload Protection: protection circuits guard the instrument during operation.
- Remote Service: the embedded system supports remote diagnostics to reduce downtime.
- Traceable Calibration: calibration is traceable to keep test data measurable and defensible.
- Standard Communication Interface: connects to external systems for data transfer.

THEORY & METHOD

Theory and Method

The Gurley method measures how easily air passes through a porous material by timing a fixed volume of air forced through the specimen under a set pressure. The instrument clamps the specimen over a test head, applies a controlled differential pressure, and drives air through the sample. The standard Gurley pressure is 1.22 kPa, and the test head defines the exposed area.

Air resistance is reported in Gurley seconds, the time for a set volume of air, typically 100 cm³, to pass through the specimen: a denser, less permeable material takes longer and reads a higher Gurley value. Air permeance is the inverse, reported in $\mu\text{m}/\text{Pa}\cdot\text{s}$, and describes how readily air flows through per unit pressure and area. The instrument computes both from the measured flow and pressure.

High-accuracy pressure and flow sensors track the test in real time, and automatic pressure control holds the differential steady so the material governs the result. Interchangeable test heads and an adjustable pressure range let the instrument cover a wide span of permeabilities, tight battery separators through open nonwovens, on one platform.

TECHNICAL SPECIFICATIONS

Air Permeability Tester - ToronAPT™ 5636 Technical Specifications

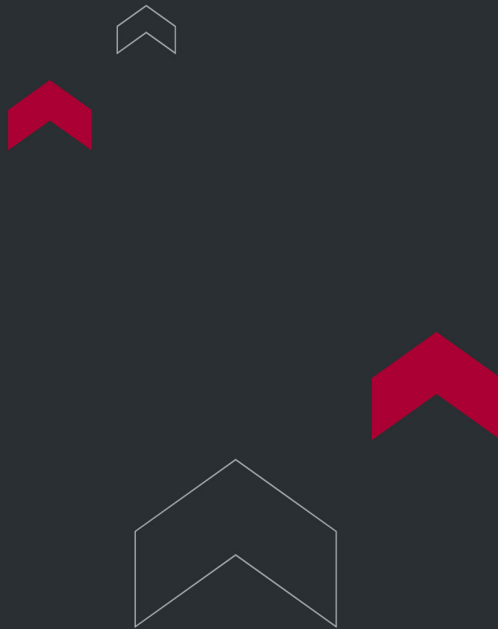
Parameter	Specification
Test Range (Gurley)	30 to 60,000 Gurley seconds (standard); 0 to 60,000 or 300 to 60,000 Gurley seconds (optional)
Test Range (Permeance)	0.0021 to 200 μm/Pa·s (standard)
Resolution	0.1 Gurley seconds
Sample Amount	1 (standard)
Differential Pressure	0.01 kPa to 20 kPa (standard setting: 1.22 kPa)
Pressure Accuracy	0.01 kPa
Test Area	1.0 in² (0.25 in², 0.1 in² optional)
Sample Thickness	≤ 5 mm
Test Gas	Air, O₂, N₂, CO₂ (user-supplied)
Gas Supply Pressure	0.3 MPa to 1.0 MPa
Gas Interface	Ø6 mm
Dimensions	370 mm (L) × 320 mm (W) × 220 mm (H)
Voltage	AC 220 V, 50 Hz (110V is also available)
Net Weight	20 kg

Standard Delivery

Item	Description
Main Unit	Automatic Gurley air permeability test instrument
Test Head (1.0 in²)	Standard test head defining the exposed test area
Moisture Filter	Conditions the incoming compressed air
Precision Pressure Regulator	Regulates the air supply pressure

Optional Accessories

Item	Description
Interchangeable Test Heads	0.25 in² and 0.1 in² heads for smaller test areas
Drying Tube	Additional air drying for the gas supply
Desiccant	Drying medium for the drying tube
Calibration Assembly	Reference assembly for traceable calibration



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