



PLASTIC SMOKE DENSITY TESTER

Plastic Smoke Density Tester – ToronFT™ DT-P

ToronFT™ DT-P is a Plastic Smoke Density Tester specifically designed to measure the specific optical density of smoke produced when plastic materials undergo combustion. As a high-performance density tester, it evaluates the maximum specific optical density — the key parameter used to assess the smoking performance of plastics under defined test conditions. This system is ideally suited for materials quality control, product development, and regulatory compliance applications across the plastics and cable industries.

The ToronFT™ DT-P integrates a closed combustion test chamber with a photometer measurement system, radiation cone device, combustion system, weighing instrument, igniter, temperature measurement instrument, and dedicated smoke density test software — all forming a complete, turnkey testing solution compliant with internationally recognized standards.

APPLICATIONS

Plastic Smoke Density Tester – ToronFT™ DT-P Applications

- Smoke density evaluation of plastic materials used in electrical and electronic products
- Compliance testing of plastic components for building and construction applications
- Product development and formulation testing of flame-retardant and low-smoke plastic compounds
- Quality assurance testing for plastic cable jacketing and insulation materials
- Research and certification testing of engineering plastics and polymer composites
- Third-party and accredited laboratory density tester applications for plastics fire performance

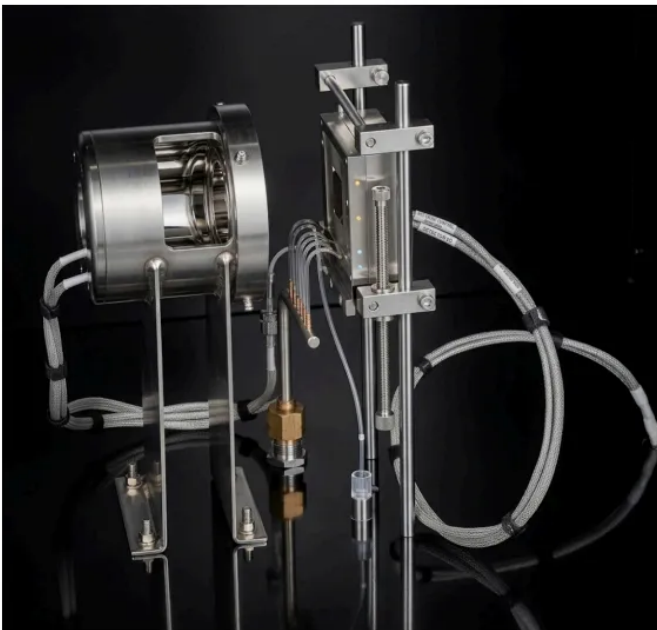


Standards

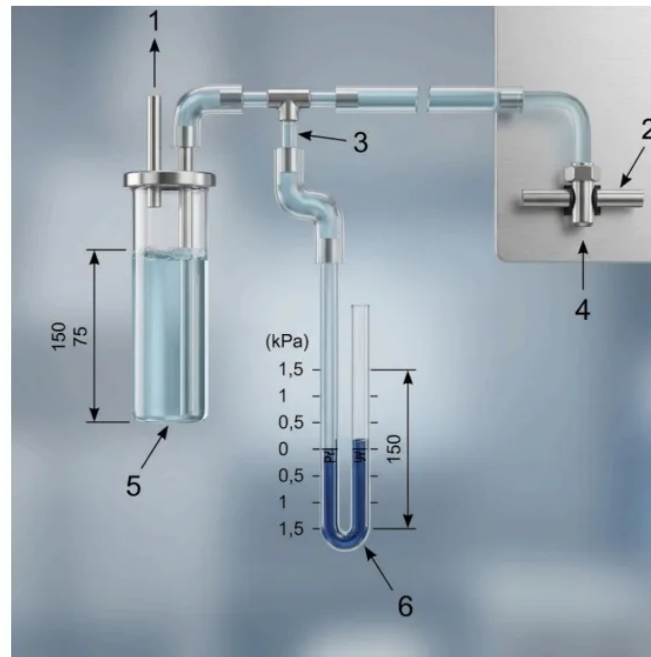
- ISO 5659-1: Plastics: Smoke Generation — Part 1: Guidance on Optical Density Testing
- ISO 5659-2: Plastics: Smoke Generation — Part 2: Determination of Optical Density by a Single-Chamber Test

FEATURES

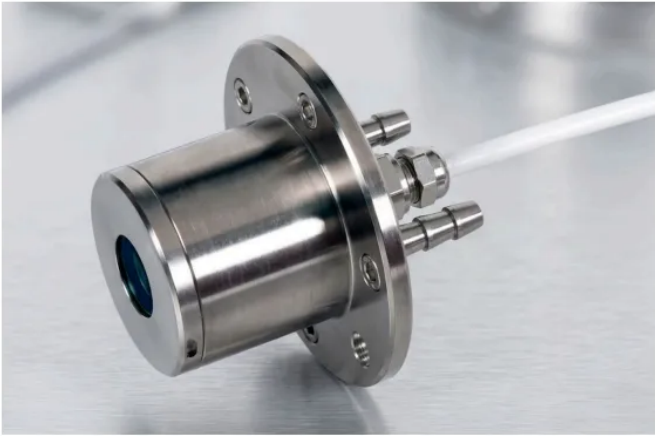
Plastic Smoke Density Tester - ToronFT™ DT-P Key Features



Heating system



Pressure Relief Device



Heat flow sensor



Sample clamps



Radiant hammer

- Complete, integrated test system including combustion chamber, photometer measurement system, radiation cone device, combustion system, weighing instrument, igniter, test box, bracket, temperature measurement instrument, and smoke density test software
- Closed smoke density test chamber constructed with inner and outer walls made of chemical-corrosion-resistant metal layers for durability and ease of cleaning

- Precise chamber geometry: length 914 ± 3 mm, height 914 ± 3 mm, depth 610 ± 3 mm
- Radiation cone device provides uniform and controlled heat exposure on the specimen surface
- Integrated weighing instrument for accurate specimen mass measurement before and after testing
- Automatic igniter system for consistent and reproducible pilot flame ignition
- Real-time photometer measurement system for continuous optical density monitoring throughout the burning test
- Dedicated smoke density test software with automated data acquisition, Ds curve plotting, and report generation
- Data acquisition system with control box for centralized test management
- Corrosion-resistant chamber construction simplifies decontamination and maintenance after each density tester cycle

THEORY & METHOD

Theory and Method

The ToronFT™ DT-P measures the optical density of smoke produced in a closed-chamber environment using a photometric method. A plastic specimen is exposed to a defined radiant heat flux from a radiation cone device under controlled conditions (with or without a pilot flame). As the specimen heats and burns, smoke accumulates within the closed test chamber. A photometer measures the attenuation of a light beam passing through the smoke column, and the specific optical density (Ds) is calculated from the measured transmittance values.

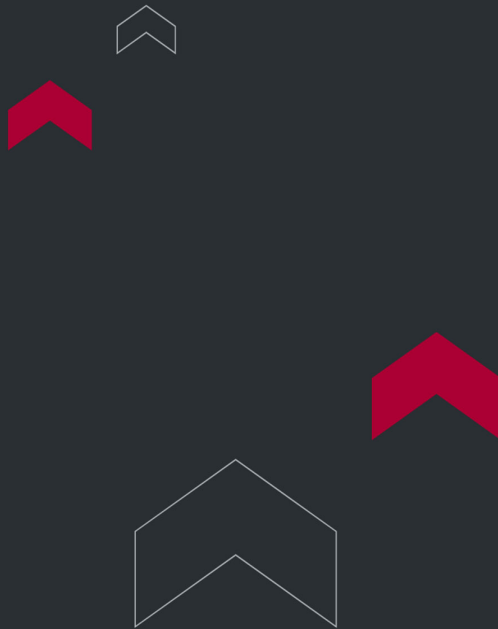
The maximum specific optical density (Ds,max) — the worst-case smoke obscuration during the test — serves as the primary reported result for material comparison and compliance purposes. The system's data acquisition and smoke density test software continuously logs photometric data throughout the test, enabling full curve analysis and automated reporting.

TECHNICAL SPECIFICATIONS

Plastic Smoke Density Tester - ToronFT™ DT-P Technical Specifications

Component / Parameter	Specification Details
General Information	
Product Name	Plastic Smoke Density Tester
Brand / Model	ToronFT™ DT-P
Applicable Standards	ISO 5659-1; ISO 5659-2
Test Chamber & Construction	
Chamber Type	Closed combustion test chamber
Internal Dimensions (L×H×D)	914 ± 3 mm × 914 ± 3 mm × 610 ± 3 mm
External Dimensions	1822 mm × 860 mm × 1970 mm
Wall Construction / Material	Double-layer metal structure (chemical corrosion-resistant) featuring multi-layer anti-corrosion coating, stainless steel, and an insulation layer
Safety Features	Equipped with a safety pressure relief device
Radiation & Heating System	
Heat Source	Radiation cone device
Radiation Cone Intensity	10-50 kW/m² (±0.5)
Radiation Furnace Intensity	25 kW/m² (±0.05)
Temperature Control Range	Room temperature to 1000°C (±1°C)
Optical Measurement System	
Measurement Type	Photometer (optical transmittance)

Component / Parameter	Specification Details
Measurement Range	0–100%
Resolution	0.0001%
Measurement Accuracy	±3%
Photomultiplier Tube	S4 response (300–650 nm)
Heat Flow & Weighing System	
Heat Flow Meter	• Range: 0–100 kW/m² • Accuracy: ±0.5%
Weighing System	• Range: 0–2000 g • Accuracy: 0.1 g
Gas & Ignition System	
Ignition System	Automatic igniter
Gas & Flow Control	• Propane Flow Rate: 1–100 mL/min • Airflow: 0.1–1 L/min • Control Accuracy: ±1.5% FS (Full Scale)
Control System & Software	
Data Acquisition	Integrated data acquisition system and control box
Test Software	Dedicated smoke density test software
Power Supply & Environment	
Voltage	AC 200–240V / 50Hz (110V is also available)
Operating Temperature	Room temperature to 40°C



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