

TOXICITY INDEX (CIT) METER



Toxicity Index (CIT) Meter - ToronFT™ CIT

ToronFT™ CIT Toxicity Index (CIT) Meter is a precision analytical laboratory instrument designed for non-metallic material toxicity index testing of halogen-free, low-smoke, low-toxic wires, cables, and optical cables. The Conventional Index of Toxicity (CIT) is a key safety parameter for wire and cable products installed in enclosed environments — such as buildings, tunnels, ships, and rolling stock — where the toxicity of combustion gases must be strictly controlled to protect occupants during a fire event.

The ToronFT™ CIT features a tubular furnace with balanced temperature field, low surface temperature, and fast temperature rise and fall characteristics, with an effective heating cavity length and pipe diameter of 600 mm × ø42 mm. It complies with EN 50305, EN 45545-2, and NF X70-100 — the primary international standards governing non-metallic material toxicity index testing — and is suitable for use in accredited testing laboratories, wire and cable manufacturers, and certification bodies in North America and internationally.

APPLICATIONS

Toxicity Index (CIT) Meter - ToronFT™ CIT Applications

The ToronFT™ CIT is applicable for toxicity index (CIT) testing of the following non-metallic wire and cable materials:

- Halogen-free, low-smoke, low-toxic (LSZH/LS0H) wire and cable sheath and insulation materials for CIT toxicity index compliance
- Optical cable sheath materials requiring non-metallic material toxicity index testing for tunnel, railway, and building applications
- Rolling stock and rail transit cable materials requiring CIT toxicity index certification per EN 45545-2
- Ship and marine cable materials for toxicity index testing per EN 50305 and IEC 60092-350

- Building wire and cable non-metallic materials for CIT toxicity index characterization for enclosed space installations
- Research and development of new LSZH/LS0H cable insulation and jacket compounds for toxicity index performance optimization



Standards

The ToronFT™ CIT is designed to comply with the following international standards for non-metallic material toxicity index testing:

- EN 50305: Electric cables used on ships: Test methods (including CIT toxicity index)
- EN 45545-2: Railway applications: Fire protection on railway vehicles — Requirements for fire behaviour of materials and components
- NF X70-100: Fire behaviour analysis: Decomposition under the action of heat — Analysis of gaseous effluents
- IEC 60754-1: Test on gases evolved during combustion of materials from cables — Determination of the amount of halogen acid gas

FEATURES

Toxicity Index (CIT) Meter – ToronFT™ CIT Key Features

- Purpose-built Conventional Index of Toxicity (CIT) meter for non-metallic material toxicity index testing — providing the standardized combustion and gas collection platform required for EN 50305, EN 45545-2, and NF X70-100 CIT compliance testing
- Tubular furnace with balanced temperature field, low surface temperature, and fast temperature rise and fall characteristics — providing stable, accurate combustion conditions for reproducible toxicity index measurements
- Effective heating cavity: 600 mm length × ø42 mm diameter — accommodating the standard non-metallic material specimen sizes required for toxicity index testing per EN 50305 and NF X70-100
- Precise furnace operating temperature of $800 \pm 10^{\circ}\text{C}$ with a test time of 40 minutes — meeting the combustion conditions specified for toxicity index testing in EN 50305 and EN 45545-2
- P.I.D temperature control system ensures accurate, stable furnace temperature maintenance throughout the full 40-minute non-metallic material toxicity index test combustion period

- High-power electric heating system (220V/10 kW) enables rapid furnace heat-up with fast temperature rise and fall for efficient test turnaround between toxicity index measurement cycles
- Needle valve flow control maintains air flow rate at 0.33 m/s for standardized combustion gas collection and dilution conditions during the toxicity index test
- Air compressor supply of 160 L/h provides the standardized combustion air flow required for reproducible non-metallic material CIT toxicity index test conditions
- Complies with EN 50305, EN 45545-2, and NF X70-100, providing toxicity index CIT test results recognized by international wire and cable certification bodies in North America and Europe

THEORY & METHOD

Theory and Method

Toxicity index testing measures the quantity and composition of toxic combustion gases released per unit mass of cable material when burned under defined conditions — providing the Conventional Index of Toxicity (CIT) value. The CIT is calculated from the concentrations of specific toxic gas species (including CO, CO₂, HCl, HF, HBr, HCN, SO₂, NO₂, and others) measured in the furnace effluent gas, weighted by their respective toxicological equivalence factors. Materials with lower CIT values produce less toxic combustion gases per unit mass, making them safer for use in enclosed spaces.

In the ToronFT™ CIT, the non-metallic cable material specimen is placed in the tubular furnace and combusted at a controlled temperature of $800 \pm 10^{\circ}\text{C}$ for a test time of 40 minutes. The P.I.D temperature control system maintains the furnace temperature precisely throughout the combustion period.

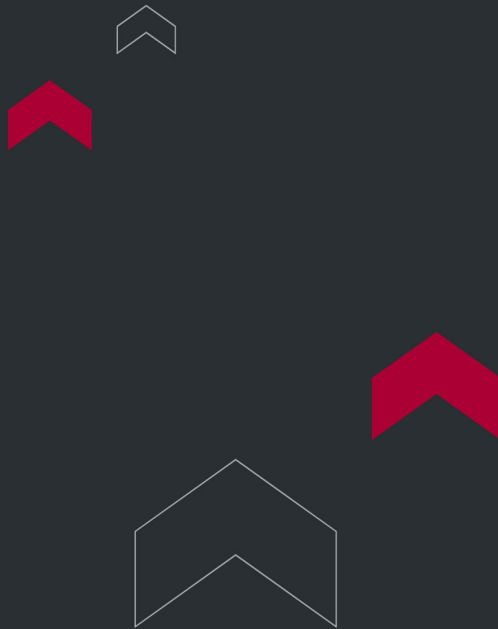
The electric heating system (220V/10 kW) provides rapid, stable heating with fast temperature rise and fall characteristics — minimizing test cycle time. The needle valve adjusts the air flow rate at 0.33 m/s for standardized gas collection, and the air source (160 L/h air compressor) supplies the combustion air at the specified flow rate. Combustion gases are collected and analyzed by the appropriate analytical equipment to determine individual toxic gas concentrations for CIT calculation.

TECHNICAL SPECIFICATIONS

Toxicity Index (CIT) Meter - ToronFT™ CIT Technical Specifications

Parameter	Specification
Product Name	Toxicity Index (CIT) Meter — ToronFT™ CIT
Furnace Type	Tubular furnace; balanced temperature field; low surface temperature; fast rise/fall
Effective Heating Cavity Length	600 mm
Effective Heating Pipe Diameter	Ø42 mm
Furnace Operating Temperature	800 ± 10°C
Test Time	40 minutes
Temperature Control System	P.I.D (adopted)
Heating System	Electric; 220V/10 kW (110V is also available)
Air Flow Rate	0.33 m/s (needle valve controlled)
Air Source	Air compressor; 160 L/h
Compliance Standards	EN 50305; EN 45545-2; NF X70-100

For more information, pricing, or to request a quotation, please contact ToronFT. Specifications are subject to change without prior notice.



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