Large Scale Oxygen Depletion Calorimetry – Room Corner Test

ISO 9705 - EN 14390 - ASTM D5424 - ASTM D5537
ASTM E603 - ASTM E1537 - ASTM E1590 - ASTM E1822
NFPA 265 - UL 1685 - NT FIRE 25 - NT FIRE 32

THE BENCHMARK IN FIRE TESTING

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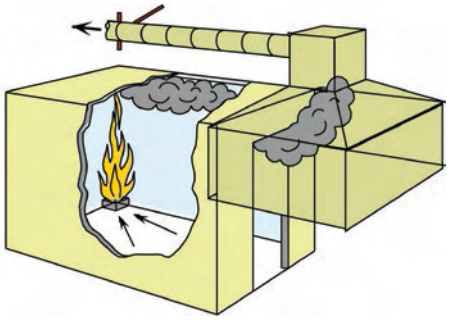
The method evaluates the fire characteristics of a surface product in a room fire scenario. The main field of application is for building products that, for some reason, cannot be tested in small scale, for example thermoplastic materials, joint systems and large irregular shaped materials. Other products can also be evaluated in the method, for example pipe insulation and upholstered furniture.

The room corner tests simulate a fire that starts under well-ventilated conditions, in a corner of a small room with a single open doorway. The method is intended to evaluate the contribution to fire growth provided by a surface product using a specified ignition source. The test provides data for a specified ignition source for the early stages of a fire from ignition up to flashover. The standards listed above require specific measurement techniques inside and outside the room.



On-site system in a fire research institute

FTT Room Corner Test

FTT supply the room corner test with the appropriate instrumentation depending on customer's requirements; a complete system and installation, an upgrade to existing facilities or just the gas analysis instrumentation console and a duct section for those with a wish to build their own apparatus.

The analyser console contains all the necessary instrumentation to measure heat release rate and other associated parameters. The analyser has been developed specifically for FTT Calorimeters; incorporating a high stability temperature controlled paramagnetic oxygen sensor (optional CO/CO_2) with flow control and by-pass for fast response. The specification of this instrumentation is the same for both large and small scale calorimeters and can therefore also be conveniently used with the FTT Cone Calorimeter.

When used with the Cone Calorimeter the console is conveniently located with the Cone Calorimeter unit.

The Duct Insert contains probes for gas sampling and exhaust flow measurement along with smoke measurement equipment (white light or laser). Most dynamic fire testing apparatuses can be instrumented with this equipment to measure heat release and smoke production rates from products burnt in them.

Gas Analysis Instrumentation Console

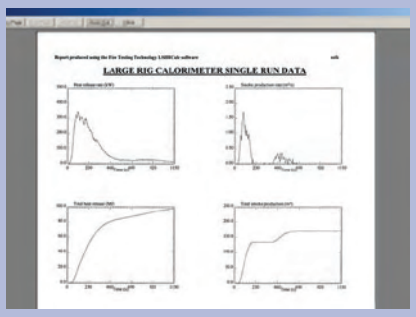
Among other options, FTT also offer burners constructed to ISO 9705 Annex A1 and A2 complete with gas train. A mass flow controller with digital display controls the gas flow. The gas controls include an auto-ignition unit incorporating several safety features.

Main Features

- Gas Analysis Instrumentation Console. For the measurement of:
  - Oxygen depletion
  - CO/CO_2 production (optional extra)
  - Laser measuring circuitry for dynamic smoke measurement (optional extra)
  - Cooling column/cold trap for the removal of moisture
  - Moisture and CO_2 drier tubes
  - Vent valve to ensure correct gas pressure
- Duct insert for Room Corner Test showing laser smoke unit and sampling ports. Fitted with:
  - Sampling probe for the oxygen depletion and CO/CO_2 gas train
  - Bi-directional probe for volume flow monitoring
  - 0.5 mW Helium-neon laser system with photometric detector, all in a rigid cradle with a retaining strip around the duct (optional) or White Light Smoke Measurement System (optional)
  - Flow thermocouple and smoke thermocouple
  - Soot filter for removal of fine particulates

LSHRCALC Software

LSHRCalc is a Microsoft Windows based software package that enables automatic data collection and manipulation from the sophisticated data logger supplied with the Gas Analysis Instrumentation Console. It automatically calculates the heat release rate and associated parameters generating a detailed report for the product(s) being tested.



The user friendly software interface allows the operator: -

- To see the status of the instrument
- Calculate the required parameters
- Calibrate the instrument and store calibration results
- Collect and view data generated during a test
- Present the results in a manner approved by the Standards

White light smoke measurement system

Options

- Laser smoke measurement system. A 0.5mW helium-neon laser system with twin photo detectors
- White light smoke measurement system. Tungsten filament lamp, lens and detector system
- Large scale mattress fire test CA TB 603 / 16 CFR 1633. This test method is a full scale flammability test which exposes a mattress specimen to a pair of T-shaped propane burners and allows it to burn for a specified period of time. The combination of burner stand-off distance and propane gas flow rate to the burners determines the heat flux they impose on the surface of the test specimen so that both of these parameters are tightly controlled. The heat release rate is measured by means of oxygen consumption calorimetry.

Mattress test CA TB 603 / 16 CFR 1633

Technical Specification

Measuring principle	Measurement of fire characteristics of a surface product in a room fire scenario
Dimensions of gas analysis console	600mm (W) x 600mm (D) x 1800mm (H)
Sampling probe	Cylindrical with a series of holes along its length. 10 mm external diameter stainless steel.
Burners	Twin sandbox (main and auxiliary) includes automatic safety cut-off solenoid valve
Cooling column	Operating temperature 0 to 4°C
Sample pump	Double ended Teflon coated diaphragm pump; capacity 30l/min
Exhaust system	Stainless steel. (a minimum distance of 3500mm from exhaust hood to measurement system is required). Exhaust hood dimensions as per customer requirements
Duct insert	Stainless steel - 400mm/16 inches diameter (customer to specify), 762 mm long. Custom inserts available on request.
Particle filter	Eliminates all particles >0.3µm.
Oxygen analyser	0 – 25% for O_2 0 – 10% for CO_2 (option) 0 – 1% for CO (option)
Laser smoke measurement system (option)	0.5mW He-Ne laser system
White light smoke measurement system (option)	Tungsten filament lamp; colour temperature 2900 ± 100K
Mattress test (option)	T-shaped propane burners with flow control Portable burner frame Burner wand assembly

Due to FTT's continuous development policy specifications could change without prior notice

Services

Electrical power	220/240VAC 8A, 50Hz or 110/120VAC 16A, 60Hz (specify at the time of order)
Extraction	A fan rating of at least 12000m^3/hr is recommended
Gases	Oxygen-free nitrogen is required for calibration of the oxygen analyser and for leak testing purposes. Commercial propane minimum 95% purity is required for the gas burner calibration
A collection vessel is required for cold trap condensate	

FTT FIRE TESTING TECHNOLOGY

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