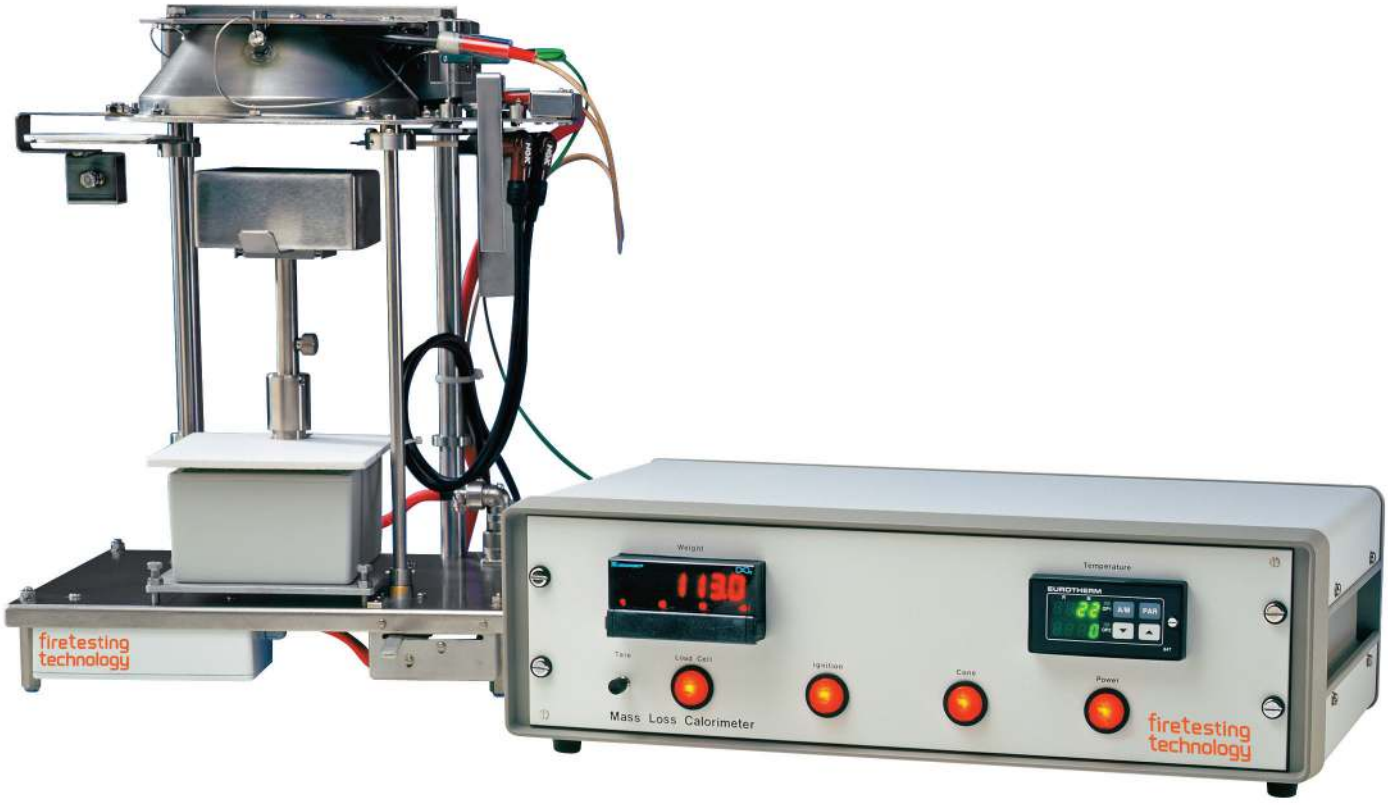
Mass Loss Calorimeter

(EN ISO 13927; EN ISO 17554)

firetesting technology



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Mass Loss Calorimeter – Simple Heat Release Test Using a Conical Radiant Heater

The test method is used to assess the mass loss rate of a product under test conditions. The International Standards ISO 13927 and ISO 17554 specify this method for assessing the mass loss rate of essentially flat specimens exposed in the horizontal orientation to controlled levels of radiant heating with an external igniter under well-ventilated conditions.

The mass loss rate is determined by measurement of the specimen mass and is derived numerically. The time to ignition (sustained flaming) is also measured in this test. Mass loss rate can be used as an indirect measure of heat release rate for many products. However, some products, e.g. those with high water content, will have mass loss rates that are not so closely linked to heat release rates.

Such products need to be tested in accordance with ISO 5660-1 for correct assessment of heat release.

FTT Mass Loss Calorimeter

The **FTT** Mass Loss Calorimeter consists of a complete fire model from the Cone Calorimeter. It is an economical solution for those working to a limited budget and with a major interest in ignitability and mass loss work.

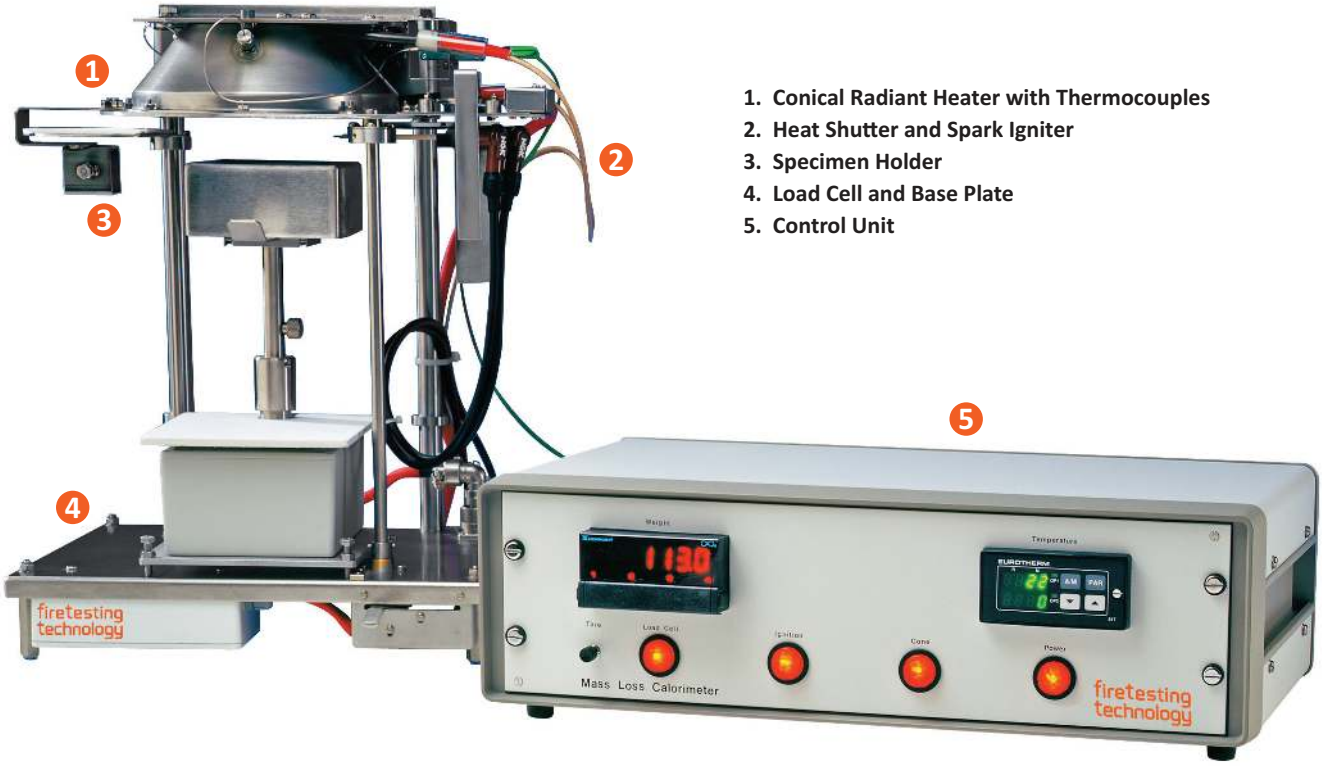
The apparatus consists of:

- Conical Radiant Heater
- Thermocouples
- Water Cooling Collar
- Heater Shutter Assembly
- Spark Igniter
- Specimen Holder
- Load Cell
- Cold Plate (optional)
- Control Unit
- Flux Meter
- MLCCalc Software
- Methane Calibration Burner (optional)
- Chimney with Thermopile (optional)

Use of this instrument under a suitable hood enables the user to carry out thermal exposure studies, under the same precise exposure conditions as those used in the Cone Calorimeter, whilst visibly observing the specimen reaction and measuring the mass change. A flue containing a thermopile can also be added to the unit. Once calibrated using a methane burner the thermopile output can be used to quantify heat release.

Features and Benefits

- Fire Model meets the specification of the ISO 5660 Cone Calorimeter.



1. **Conical Radiant Heater with Thermocouples**
2. **Heat Shutter and Spark Igniter**
3. **Specimen Holder**
4. **Load Cell and Base Plate**
5. **Control Unit**

- Fire Model manufactured from stainless steel for long life.
- 3 Control Thermocouples for the cone heater to maintain accurate heat flux.
- The special **FTT** split shutter mechanism is designed to reduce the radiated heat from affecting the sample support system and more importantly allowing time after the sample is positioned on the load cell before the test is started. The shutter is permanently in place on the apparatus and is operated using a simple lever which opens the shutter symmetrically from the centre.
- The **FTT** spark assembly is manually inserted into position using a lever mechanism. This is used in conjunction with the shutter mechanism. The sequence of operation is such that the electrodes can be positioned above the sample with the shutter closed. At the start of a test the operator opens the shutter lever which, in turn, automatically starts the spark sequence. Micro-switches are fitted to the spark arm and the shutter mechanism for safe operation.
- Sample weight measurement is by a strain gauge load cell with quick electronic tare facility. The weight of the sample holder is zeroed electronically on touching a button.
- The load cell is housed in an enclosed case to reduce the effect of temperature change.
- Control unit is supplied in its own case with switches for power, ignition, load cell and cone heater.
- Eurotherm temperature controller for ramp and control of cone heater.
- Load Cell controller with weight ranging facility to improve performance to suit weight of sample (0-500 g).
- Fire Model and Controller designed to be assembled in the **FTT** Cone frame for upgrading to a full Cone Calorimeter at a later stage if required.

MLCCalc Software

The **FTT** Mass Loss Calorimeter is a sophisticated instrument and in order to make the calibration and use of the instrument extremely easy, the MLCCalc software package is specially designed to complement the instrument. MLCCalc is a powerful, yet easy to use, Microsoft Windows based application which allows the user to perform most operations required on the apparatus with the aid of a computer. It assists with calibration routines, acquires test data and produces test reports.

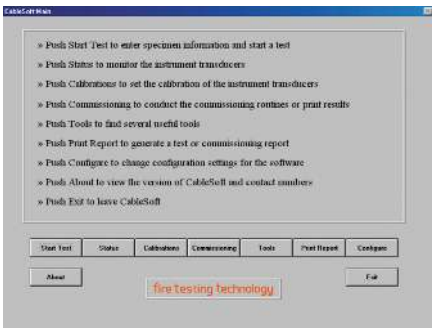
The Main panel is used to access all the functions available in MLCCalc software:

- Start Test
- Status
- Load Cell Calibration
- Heat Flux
- HRR Calibration
- HRR Check
- Print Report
- Configure
- About
- Exit

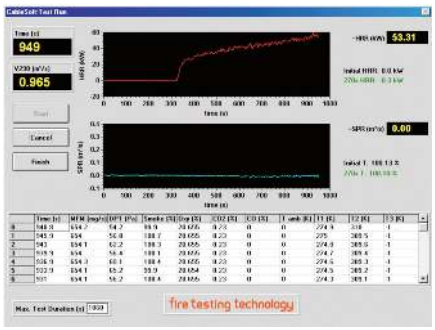
The Test Run panel shows the readings from the transducers in real time, the heat release rate and peak heat release rate (if thermopile fitted). If the specific equipment is fitted then graphs of mass, heat release rate and thermopile output are displayed. It also shows the total test time (including the baseline time), the test time (the time that the specimen has been exposed to the heat from the cone heater) and the recorded times to ignition and flameout.

When the test is finished comments about the test and the observations for any events marked during the test can be entered. Also the ignition and flameout times can be edited if required.

The results from a test or heat release rate calibration can be viewed and reports printed by simply pressing the Print Report button.



Main Panel of MLCCalc



Test Run Panel of MLCCalc

TECHNICAL SPECIFICATIONS	
Truncated Conical Heater and Spark Igniter	
Element	5kW electrical heating element
Heat flux	Up to 75-100kW/m² Heat shield Placed between the cone heater and specimen
Spark igniter	10kV spark generator with 3.0mm spark gap located 13mm above the centre of the specimen

Specimen Holder and Weighing Device	
Specimen Holder	A square pan 106mm × 106mm at the top, and a height of 25mm, constructed from stainless steel
Retainer edge frame	A stainless steel frame with inside dimension 111mm x 111mm, and opening of 94mm × 94mm
Sample size	100mm × 100mm
Sample thickness	Up to 50mm
Load cell	Total capacity up to 5.0kg Specimen capiticy up to 500g Resolution 0.1g

Due to the continuous development policy of **FTT** technical changes could be made without prior notice.

SERVICES	
Electric	220-240VAC/1ph/50Hz for control unit 220-240VAC/1ph/50Hz/32A for cone heater
Water	Low pressure water 250kPa (35psi) supply

Unrivalled Experience in Design and Manufacturing

FTT's site in East Grinstead, is home to the largest group of fire scientists and instrumentation design engineers working on fire testing instrumentation, and is at the heart of our design and manufacturing. For almost 30 years **FTT** has provided the highest quality instruments and service for fire testing and research professionals worldwide, directly and through its extensive global sales and support network.

Quality

- World-class manufacturing in accordance with multiple international and national standards, including: EN, ISO & ASTM
- ISO 14001, ISO 9001 certified

Integrity

- A dedicated team passionate about fire testing instrumentation and continuous product improvement
- Delivering reliable, robust and easy-to-use instruments for the past 30 years

Excellence

- A world-class team made up of qualified fire scientists, mechanical, electrical and electronic fire instrument design engineers and production, installation and maintenance engineers

Global

- World-wide distribution network for global sales, installations, training, maintenance and technical support
- Leading global supplier of the Cone Calorimeter, Large Scale Calorimeter, NBS Smoke Chamber and Oxygen Index