

## FTT Oxygen Bomb Calorimeter

**An affordable high resolution isoperibolic temperature regulated oxygen bomb calorimeter with embedded control computer.**

The bomb calorimeter is the most common device for measuring the heat of combustion or calorific value of a material. With this apparatus a test specimen of specified mass is burned under standardised conditions. The heat of combustion determined under these conditions is calculated on the basis of the observed temperature rise while taking account of heat loss. The combustion process is initiated inside an atmosphere of oxygen in a constant volume container, the bomb, which is a vessel built to withstand high pressures. It is immersed in a stirred water bath, and the whole device is the calorimeter vessel. The calorimeter vessel is also immersed in an outer water bath. The water temperature in the calorimeter vessel and that of the outer bath are both monitored.



**FTT Bomb Calorimeter**



**Thermostatic controller, bath, circulator, cooler and pipette supplied as standard with every apparatus**

The FTT Oxygen Bomb Calorimeter can be used to measure the heat generated from several applications and has been designed to conform to current ASTM, ISO, EN, BS and DIN international standards. The calorific value of the following groups of materials can be measured: -

- Building materials (e.g. EN ISO 1716)
- Coal, coke (e.g. ASTM D 3286)
- Fuel (gasoline, kerosene, fuel oil, No.s 1-D and 2-D diesel fuel and No.s 0-GT, 1-GT, and 2-GT gas turbines fuels) (e.g. ASTM D240-92)
- Hydrocarbon fuels (e.g. ASTM D 4809-90)
- Food, supplements, crops
- Waste and refuse
- Combustible materials, etc.

### **Isoperibolic Operating Mode**

An isoperibolic bomb calorimeter is a calorimeter where the jacket temperature is kept at a constant temperature while the calorimeter vessel (bomb and bucket) temperature rises as heat is released by the combustion of a sample. The jacket and bucket temperatures are continuously measured enabling the heat loss to be corrected for after the test.

An embedded control computer, keypad and LCD enables instrument automation, data acquisition and analysis via user friendly menu driven software.

## Automatic Temperature Control of Outer Bath

The embedded control computer automatically sets the outer bath temperature. The temperature is measured using two high precision, high resolution platinum resistance thermometers (PRTs). An external thermostatic controller, bath, circulator and cooler is supplied as standard together with a pipette for temperature controlled filling of the calorimeter vessel. This removes human error increasing repeatability and significantly reduces the preparation time between tests.

## Oxygen Filling System

To simplify instrument operation the FTT Bomb Calorimeter is fitted with a semi-automatic filling system. The user merely connects the push on coupling and presses the key to fill the bomb with oxygen. The bomb then fills to the desired pressure and automatically switches off. If this pressure is not reached an error message is shown.

## Automatic Firing

The embedded computer controls the temperature of the outer bath and shows when the calorimeter vessel temperature has stabilised. At this point the bomb is automatically fired.

## Calibration

The FTT bomb calorimeter is calibrated by burning certified benzoic acid to determine a constant called the 'water equivalent'. The instrument can record the water equivalent for several bomb/bucket combinations. For each bomb/bucket combination five calibrations are performed. The software calculates the average of these five calibrations and uses this value as the water equivalent when testing a sample.

## Ordering Guide

The FTT Bomb Calorimeter consists of: -

- Bomb calorimeter with embedded computer control, user-friendly interface, LCD graphics display, high accuracy / resolution PRTs, 2 x RS232 interfaces, parallel port for printer
- Oxygen bomb and bucket (calorimeter vessel)
- Thermostatically controlled bath, circulator, cooler, pipette (2L)
- EN ISO 1716 sample preparation device, firing wire & cotton, cigarette paper
- Accessories for installation

Optional accessories: -

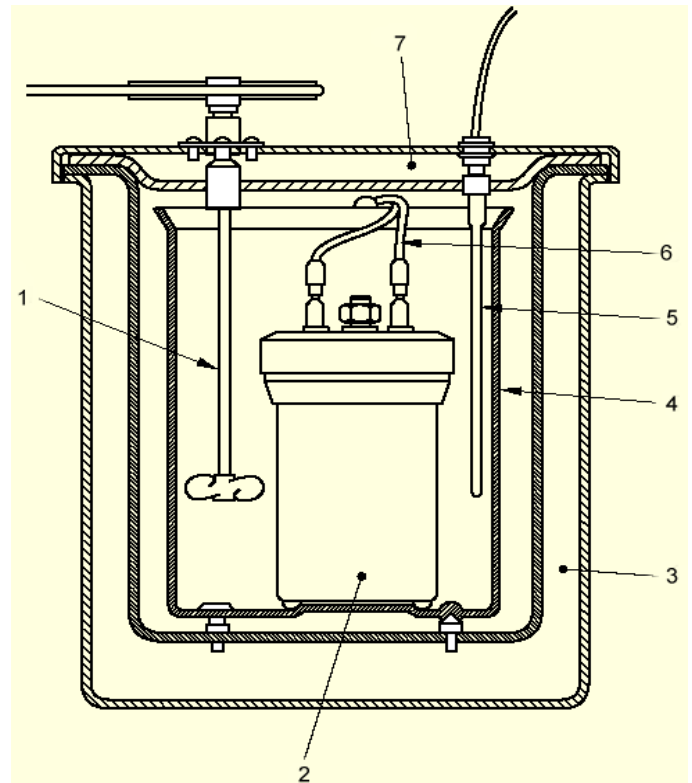
- Spare oxygen bomb
- Corrosion resistant oxygen bomb (corrosion resistant to halogen gases)
- Printer
- Bucket
- Benzoic acid, 100g
- Nickel Chrome Crucible
- Nickel Chromium Firing Wire 25m length
- Analytical Balance
- Firing cotton

## Services

- Electrical supply, 115VAC, 6A, 50/60Hz or 230 VAC, 3A, 50/60Hz
- Distilled water
- An oxygen supply is required at a pressure of between 28 and 35 bar
- Cigarette making paper

## Dimensions (l×w×h, mm)

FTT Bomb Calorimeter: 420×360×540; Tank and controller: 350×325×355; Cooling system: 460×305×225



- 1) Stirrer 2) Calorimeter bomb 3) Jacket  
4) Calorimeter vessel 5) PRT  
6) Ignition lead 7) Jacket lid

Please visit our web-site ([www.fire-testing.com](http://www.fire-testing.com)) or contact us directly for any further information on our range of fire testing instrumentation.