

BOMB CALORIMETER PTE-328



WORKING PRINCIPLE

The bomb calorimeter works on the principle of heat transfer. When a known mass of a sample is combusted in the presence of oxygen inside a strong, sealed “bomb,” the heat produced raises the temperature of a surrounding known quantity of water

OVERVIEW

A **Bomb Calorimeter** is a laboratory instrument used to measure the heat of combustion (calorific value) of solid or liquid fuels and other materials. It determines how much energy is released when a substance burns completely in oxygen under constant volume conditions.

KEY FEATURES

Bomb Vessel (Combustion Chamber):

- Strong stainless steel container to withstand high pressure.
- Contains the sample, oxygen inlet, and electrodes for ignition.

Calorimeter Bucket:

- Holds a known amount of water that absorbs the heat from combustion.

Stirrer:

Ensures uniform temperature distribution in the water during the experiment.

Thermometer or Temperature Sensor:

Measures the temperature change accurately (PT-100 Sensor)

Ignition Circuit:

Electric ignition wire used to initiate combustion of the sample.

Oxygen Filling System:

Pressurizes the bomb with pure oxygen (usually 25–30 atm).

Parameter	Specification
Combustion Chamber Material	Stainless steel (SS 304) / (SS 316)
Maximum Pressure	40–50 atm
Oxygen Filling Pressure	25–30 atm
Water Jacket Volume	2–3 liters
Temperature Accuracy	±0.001°C
Ignition Type	Electric ignition wire
Sample Size	0.5–1 g typical
Calorific Value Range	Up to 10,000 kcal/kg
Display	Microprocessor-based
Power Supply	230 V AC, 50 Hz