

Cone Calorimeter

ASTM E 1354 - ASTM E 1474 - ASTM E 1740 - ASTM F 1550 - ASTM D 6113

Scope:

The cone calorimeter measures heat release rate, total heat released and effective heat of combustion by the oxygen consumption principle. The calorimeter also measures mass loss rate, time to ignition, specific extinction area, and, optionally, carbon monoxide and carbon dioxide production during the burning of material or product specimens exposed to radiant heat fluxes from a conical heater set at values from 0 to 100 kW/m². An automatic calibration system, ConeCalc, is used for standard calibrations, but can be manually overridden. ConeCalc sets the initial values of oxygen at 20.95%, of smoke obscuration at 100% transmission, and of any other gases at 0.

Test procedure:

A conical heating element provides a constant radiation heat onto the specimen's surface. The radiation heat is set beforehand and may vary between 0 and 10 kW/m² (most commonly used temperatures are 25, 35 or 50 Kw/m²). This radiation approximates real-life fire situations.

The distance between the specimen and the bottom side of the burner is 2.5 cm. The normal position is horizontal, but the equipment can also be set up vertically.

Between the burner and the specimen there is an ignition candle to ignite possibly liberated inflammable gases.

The determination of the rate of heat release is based on the fact that the heat liberated during combustion is in proportion with the amount of used oxygen. per Kg consumed oxygen, an average of 13.1 MJ of energy is liberated.

The smoke and combustion gases of the specimen are aspirated to measure the amount of oxygen. On this basis it is possible to calculate the amount of heat, liberated during the burning of the specimen.

Specimen size:

A specimen of 10x10cm (with a maximum thickness of 5 cm) is placed on a sample holder fixed onto a weighing cell.

