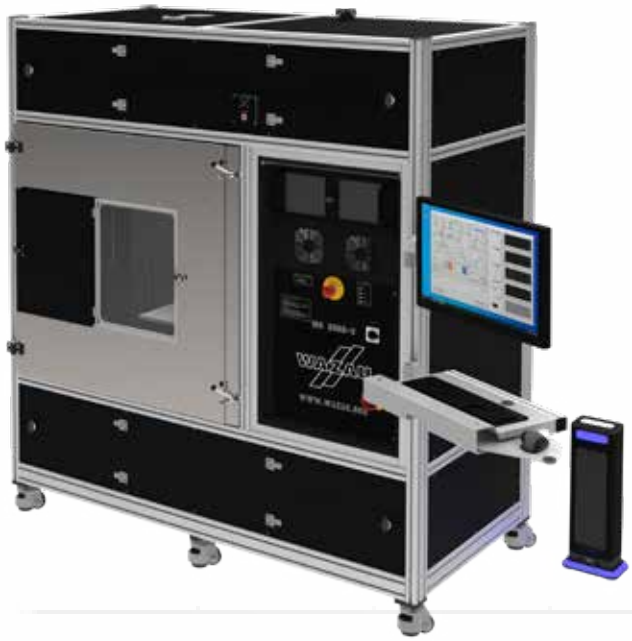
SMOKE BOX – ISO 5659-2

EN ISO 5659-2 | IMO FTP CODE Annex 1 Part 2



SCOPE

The device is used to measure smoke generation on exposed surfaces of specimens made of materials or composites.

PRINCIPLE

The specimens are exposed to thermal radiation of up to 50 kW/m^3 generated by an electric cone radiator. The gases detaching from the specimen are ignited. The resulting smoke is held in the chamber, and its density is determined using a photometric system. Alternatively, a gas burner is used in addition to the radiation from the electric radiant heater.
If the device is used for tests according to IMO FTP CODE Annex 1, Part 2, an optional FTIR spectrometer can be connected to determine the proportion of toxic substances in the flue gas.
In addition, the mass-based optical density can be determined during the test. This is done by an optional weighing module.

FEATURES

- Widely automated test and calibration procedures. Only the set-up of the instrument and the insertion of the specimens is done manually. The recording of measured data and the calculations required by the standard are also performed automatically using the integrated PC. The values are output in a measurement file.
- Cooling of the heat flux sensors is done with a closed cooling circuit using a radiator.
- One-piece heat shield with pneumatic travel
- Electronic regulation of the chamber pressure
- Integrated control cabinet
- Chamber wall heating (optional)
- Preparation for optional weighing device
- Preparation for FTIR spectrometer

SCOPE OF DELIVERY

Test device with:

- Test chamber, enameled inside
- Test table with cone radiator, heat shield, burner, ignition device
- Smoke obscuration system
- Explosion protection
- Cover flap door window
- Control cabinet with PC
- Monitor, keyboard holder, keyboard and mouse
- Inlet and outlet air valve, pneumatic
- Exhaust fan, electronically adjustable

Set of neutral density filters
Heat flux sensor type Schmidt-Boelter
Radiator with closed cooling circuit
Specimen holders

DIMENSIONS

Width x depth x height: 1818 x 890 x 1980 (2040 top exhaust duct) mm*.
Weight: approx. 500 kg*

SUPPLIES

Power 400 VAC 50/60 Hz, power consumption 5 kVA
Propane gas, purity > 95 %, inlet pressure 1 bar, cylinder pressure reducer to 150 mbar required
Compressed air, oil-free, inlet pressure 6-8 bar

SPECIMEN SIZE

Max. 75 x 75 x 25 mm*

HEATER

Heat flux 10 kW/m^2 - 50 kW/m^2 , selectable in 5 kW steps, power consumption 2600 W

CHAMBER PRESSURE MEASUREMENT

Electronic pressure transducer

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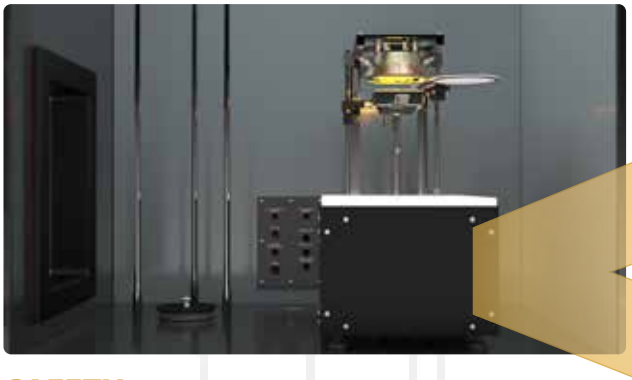
SMOKE OBSCURATION MEASUREMENT

Adjustable lens system for collimating a light beam
Adjustable aperture diaphragm for adjusting the diameter of the light beam
Adjustable lens system for focusing the light spot in the aperture diaphragm plane;
Slide-in unit for adjusting the gray filter compensation;
Set of gray filters from 0.1 - 0.9 OD
Slide-in aperture for darkening the sensor
Sensor silicium photomultiplier



SENSORS

2 thermocouples type K, heating element
Thermocouple type K, chamber wall
Heat flux sensor type Schmidt-Boelter, liquid cooled with closed cooling circuit, measuring range 0 - 75 W/m^2
Electronic chamber pressure measurement
Smoke obscuration measurement
Electronic balance (optional)

SAFETY

Emergency stop button
Externally operable ignition device for burner
Explosion protection of chamber

OPTIONAL ACCESSORY

Electronic balance
Electrical test chamber heating 500 W
FTIR-spectroscope preparation

MASS FLOW CONTROLLERS AND VALVES

Propane pilot burner: flow regulator electronically controlled, 2/2-way solenoid diaphragm valve, electrical
Compressed air: flow regulator electronically controlled, solenoid valve

TO BE PROVIDED BY THE CUSTOMER

Fluegas outlet DN80
If a residual current circuit breaker is used for the 3 ~ 400 VAC three-phase connection, it must have an extended sensitivity with trip delay for the operation of frequency converters.

EXHAUST AIR SYSTEM

Radial fan, capacity 149 m^3/h*, continuously adjustable via software
Pneumatic ball valve, connection size DN 80

SPATIAL REQUIREMENTS

Installation room width x depth x height: approx. 3018 x 3090 x 2500 m
Level (deviation max. ± 5 mm), fire-resistant floor

PC

Integrated, incl. monitor/keyboard/mouse
Operating system Windows 11
Software: MCC DAQ & DIN EN ISO 5659-2

* Our products are constantly evolving. For this reason, the actual dimensions may differ.

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