LED Smoke Density Photometric System

firetesting technology

(Based on DIN 50055; ISO 3182; ISO/TS 19850
Used in ISO 9705; EN 13823 (SBI); EN 50399;
UL 9540A; EN ISO 9239-1)

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The FTT 'Smoke Density Photometric System' (based on DIN 50055 and ISO 3182) is designed to be used in conjunction with equipment that measures smoke from burning materials. The unit can be fitted to several instruments such as the Room/Corner Test (ISO 9705), Single Burning Item (SBI) (EN 13823), Heat Release and Smoke Production Apparatus for Cables (EN 50399), UL 9540A, Flooring Radiant Panel (EN ISO 9239-1), etc.

The apparatus consists of:

- Light Source
- Light Measuring System
- Control Unit

New LED replaces halogen lamp

The Light Source has traditionally been a halogen gas filled tungsten filament lamp, however that has become obsolete, with no direct replacement found. The technical specifications of ISO/TS 19850 provide a methodology for comparing traditional white light systems with new LED lighting to confirm they can be used as an alternative. FTT has developed a new LED white light source and has demonstrated that the difference in results between the LED and Halogen systems are statistically insignificant.

The new FTT LED system was tested in accordance with ISO/TS 19850. Tests for drift and noise, optical filter checks and response times show that the new LED white light source has a similar (if not better) performance to the legacy halogen system. Smoke tests in an SBI following Method B of ISO/TS 19850 show that the difference between the results from LED and halogen systems for s1, s2 and s3 is statistically insignificant.

New System / Upgrade:

FTT's newly developed LED white light system is housed in the same sized unit as the halogen filament source and therefore physically fits into the same support system. Power for the system is provided by a new power supply complete with a LED drive unit.

For upgrades of just the light source, customers with the legacy power supply unit can use an adapter cable that contains the required LED drive unit, instead of buying a new Control Unit.

The Light Measuring Device consists of:

- Achromatic system of lenses
- Silicon photo-electric cell
- High-gain low-noise amplifier

These components are housed in an assembly with a collimating lens.

The signal from the Light Measuring Device is taken to the the Control Unit then to software, capable of continuously measuring relative light intensity against time as percentage transmission over the ranges to be studied.

The system has a linear response with respect to transmittance and an accuracy of better than ±1.5% of the maximum reading.

Low Smoke Heptane Test (s1)

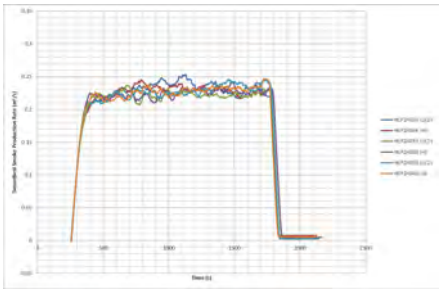
Medium Smoke Heptane Test (s2)

High Smoke Heptane Test (s3)

An analogue voltage output from the Control Unit (for the transmission) can be taken to a data acquisition unit built directly into the **FTT** gas analysis rack for large-scale calorimeters (including the SBI, EN 50399, Room/Corner Test and UL 9540A) and Flooring Radiant Panel.

A standalone Windows based software package is also available to enable simple data acquisition, analysis and storage via a data acquisition system.

SBI Smoke Measuring System



Testing of the New LED System

Smoke Photometric System

Halogen					
Fire Parameter	Test 1	Test 2	Test 3	Av	Units
TSP/m	121.18	120.92	120.12	120.74	m^2/kg
TSP_{600s}	123.67	121.72	121.78	122.39	m^2
SMOGRA	21.62	22.63	22.44	22.23	m^2/s^2
Peak SPR_{Av}	0.245	0.242	0.247	0.245	m^2/s

LED					
Fire Parameter	Test 1	Test 2	Test 3	Av	Units
TSP/m	122.11	119.06	120.63	120.60	m^2/kg
TSP_{600s}	122.64	121.36	121.10	121.70	m^2
SMOGRA	21.51	21.87	22.44	21.94	m^2/s^2
Peak SPR_{Av}	0.253	0.237	0.246	0.245	m^2/s

T-Test Calculations			
Fire Parameter	Pooled SD	Units	*t*-test
TSP/m	1.1471	m^2/kg	0.1495
TSP_{600s}	0.9771	m^2	0.8649
SMOGRA	0.5040	m^2/s^2	0.7047
Peak SPR_{Av}	0.0060	m^2/s	0.1043

Test Results

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 over 35 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 9001 and ISO 14001 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 35 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