

## Transfeu WP2 Subtask 2.1.2 Development of small-scale test method for fire effluents

### Step 5 : Development of calibration method

#### Smoke chamber test – Chamber leakage test

##### According to DoW

► **Step 5: Development of calibration method**

Partners: *LSFIRE, LNE, RATP, VTT, SP, CUR*

The optimum calibration procedures will be carried out in parallel by **LSFIRE, LNE, RATP, VTT, SP** and **CUR**. These procedures will be established by checking of thermal attack and by measurements of gases, with particular attention to the quantitative measure for the expected kind of gases.

#### 1. Forward

The procedure chamber leakage test should be in accordance with the paragraph 7.6 and 9.6 of the ISO DIS 5659-2 Standard (2004) and here following reported.

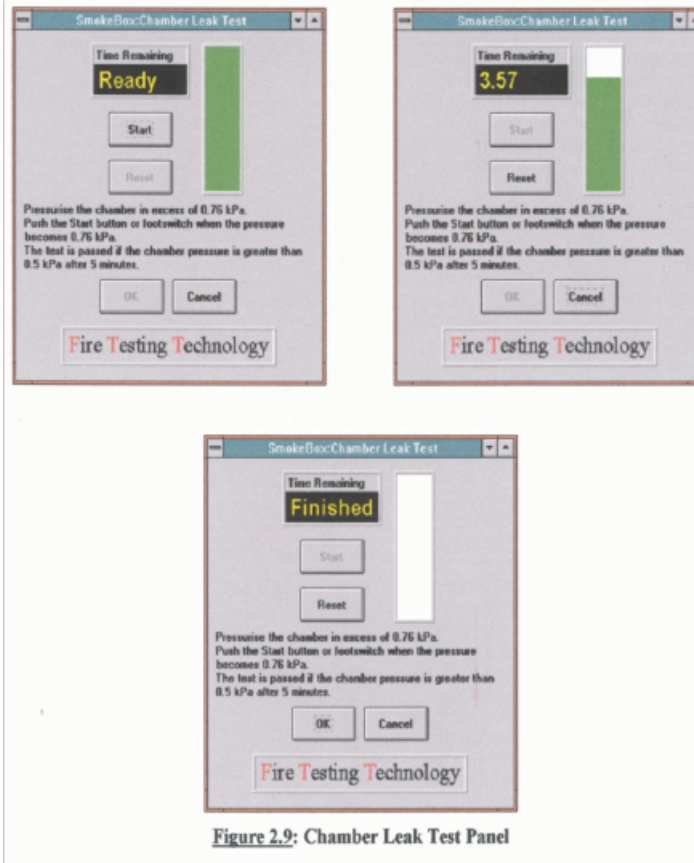
#### 2. Set up of apparatus

With the specified items of equipment properly assembled ready for test and after the heater has been on at 25 kW/m<sup>2</sup> for 10 minutes or at 50 kW/m<sup>2</sup> for 5 minutes, the chamber shall be sufficiently airtight to comply with the requirements of the leakage rate test following described.

For relative pressure measurement during the leakage rate test, a standard glass manometer or U-tube (water gauge) joined to the specific wall chamber hole may be used. For more precise measurement the use of a pressure transducer/transmitter with a minimum reading range from 0.8 to 1,5 Bar is preferable.

NOTE The most likely sources of leakage have been found to be the door seal, the inlet and outlet vents and the safetyblow-out panel.

Picture 1:



### 3. Leakage rate test

- a. Once the heater has been on at 25 kW/m<sup>2</sup> wait 10 minutes closing the chamber door, the exhaust and inlet vent.
- b. At this time the wall chamber temperature will not exceed 45 °C
- c. Close than all spare gas sampling pipe and introduce (within 15s) compressed air into the chamber through one of the gas sampling pipes until the pressure recorded on the manometer is over 0.76kPa (76mm water gauge) and then shutting the supply off.
- d. Start the data collection of relative pressure trend at least each 15s for 10min
- e. At the end of data collection open the chamber door, exhaust and inlet vent.
- f. Increase the cone heater feeding until the irradiance level reach 50 kW/m<sup>2</sup> and wait for the thermal equilibrium.
- g. Close than the chamber door, the exhaust and inlet vent; wait for 5 min.
- h. At this time the wall chamber temperature will not exceed 60 °C
- i. Close than all spare gas sampling pipe and introduce (within 15s) compressed air into the chamber through one of the gas sampling pipes until the pressure recorded on the manometer is over 0.76kPa (76mm water gauge) and then shutting the supply off.
- j. Start the data collection of relative pressure trend at least each 15s for 10min
- k. At the end of data collection open the chamber door, exhaust and inlet vent.

#### **4. Leakage requirements**

In both the irradiance levels tested, the air-tightness of the chamber shall be such that the time taken for the recorded pressure drop from 0,76 kPa to 0,50 kPa (from 76mm to 50mm water gauge) determined using the timing device (data collection), shall not less than 5,0min.

#### **5. Report**

The leakage rate test report shall include all the following data:

- a.** Date of test
- b.** Name of laboratory
- c.** Type of manometer (U tube / water gauge) or transducer/transmitter used
- d.** For each irradiance level tested should be reported:
  1. The chamber wall temperature at relative pressure starting time
  2. Indicate if the requirements are fulfilled or not

Note: In case of using a transducer/transmitter add the curve of relative pressure vs time

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