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European Assessment Document for

Resettable line-type heat detectors

This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

Contents

1 SCOPE OF THE EAD

1.1 Description of the construction product

Resettable line-type heat detectors (hereinafter also referred to as "RLTHD") consist of a sensing element using an optical fibre, a pneumatic tube or an electrical sensor cable connected to a sensor control unit, either directly or through an interface module.

The resettable line-type heat detectors can have different response temperatures (heat response classes) as defined in EN 54-22[1], clause 4.1.2.

The product is not covered by a harmonised European standard. However, the product is covered by the non-harmonised standard EN 54-22, therefore, the provisions and test methods of this standard are fully adopted without deviations. Furthermore, this EAD also covers the essential characteristics for reaction to fire and content, emission and/or release of dangerous substances.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations, e.g., with regard to the intended end use conditions, having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA as long as the details of the assessment methods as laid down in this EAD are respected.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

Resettable line-type heat detectors are intended for use in fire detection and fire alarm systems installed in and around buildings and other civil engineering works. These detectors are typically intended to be used in areas where point type heat detectors are presented with challenging environmental characteristics and also where access to the detectors may significantly influence the fire alarm system design.

The products are intended to be used for room protection (see EN 54-22, clause 3.1.10) and for local protection (see EN 54-22, clause 3.1.5) or for both. In addition, distinction is made between integrating and non-integrating line-type heat detectors.

The response classes for applications are specified in section 4.1.2 of EN 54-22.

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1 All undated references to standards in this EAD are to be understood as references to the dated versions listed in chapter 4.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the resettable line-type heat detectors for the intended use of 10 years when installed in the works. These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product, the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works[2].

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

1.3 Specific terms used in this EAD

For the purposes of this document the terms and definitions given in EN 54-22 and EN 54-1 apply.

1.3.1 Environmental groups (see EN 54-22, clause 4.1.3)

1.3.2 Local protection application (see EN 54-22, clause 3.1.5)

1.3.3 Room protection application (see EN 54-22, clause 3.1.10)

1.3.4 Integrating line-type heat detector (see EN 54-22, clause 3.1.2)

1.3.5 Non-integrating line-type heat detector (see EN 54-22, clause 3.1.8)

[2] The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of resettable line-type heat detectors is assessed in relation to the essential characteristics.

Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

No	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 2: Safety in case of fire			
1	Nominal activation conditions/sensitivity	2.2.1	Level, description
2	Operational reliability	2.2.2	Description
3	Tolerance to supply voltage	2.2.3	Level, description
4	Performance parameters under fire conditions - Fire sensitivity (for room protection applications only) - Static response temperature test	2.2.4 2.2.4.1 2.2.4.2	Description
5	Durability of nominal activation conditions/ sensitivity	2.2.5	Level, description
6	Reaction to fire	2.2.6	Class
Basic Works Requirement 3: Hygiene, health and the environment			
7	Content, emission and/or release of dangerous substances	2.2.7	Level, description

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer, and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

If for any components covered by harmonised standards or European Technical Assessments the manufacturer of the component has included the performance regarding the relevant essential characteristic in the Declaration of Performance, retesting of that component for issuing the ETA under the current EAD is not required.

Concerning test conditions (atmospheric conditions, operating conditions, mounting arrangements, tolerances) see EN 54-22, clauses 5.1.1 to 5.1.4. The specimens shall be tested in accordance with the test schedule in EN 54-22, clauses 5.1.6 and 5.1.7 (table 3).

2.2.1 Nominal activation conditions/sensitivity

2.2.1.1 Individual alarm indication

Purpose of the assessment:

Assessment of visibility of alarm indication.

Assessment method

See EN 54-22, clause 5.2.1.

Expression of results

It shall be indicated in the ETA whether the signal was visible under test conditions or not.

2.2.1.2 Signalling

Purpose of the assessment

Assessment of correct signalling of the alarm and fault signal(s).

Assessment method

See EN 54-22, clause 5.2.2.

Expression of results

It shall be indicated in the ETA whether the alarm and fault signal(s) have been generated correctly.

2.2.1.3 Repeatability

Purpose of the assessment

To show that the RLTHD is stable with respect to its sensitivity, even after a number of alarm conditions (see EN 54-22, clause 5.2.3.1).

Assessment method

Measurement of the response time of the specimen in accordance with EN 54-22, clause 5.2.3.2.

If the manufacturer does not specify the duration of the recovery period, it shall be set to 60 minutes.

Expression of results

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1} and 20 K min^{-1}.

2.2.1.4 Reproducibility

Purpose of the assessment

To show that the sensitivity of the detector does not vary unduly from specimen to specimen and to establish response time data for comparison with the response times measured after the environmental tests (see EN 54-22, clause 5.2.4.1).

Assessment method

See EN 54-22, clause 5.2.4.2. If the manufacturer does not specify the duration of the recovery period, it shall be set to 60 minutes.

Expression of results

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1} and 20 K min^{-1}.

2.2.2 Operational reliability

2.2.2.1 Connection of ancillary devices

Purpose of the assessment

Assessment of the operational reliability in the event of a wire break and short circuit in ancillary equipment connections.

Assessment method

See EN 54-22, clause 5.3.1.

Expression of results

It shall be indicated in the ETA whether the detector works correctly.

2.2.2.2 Manufacturer's adjustments

Purpose of the assessment

Assessment that the settings made by the manufacturer cannot be changed or can only be changed using code (see EN 54-22, clause 5.3.2).

Assessment method

Visual inspection of a specimen (see EN 54-22, clause 5.3.2).

Expression of results

It shall be indicated in the ETA whether it is possible to change the manufacturer's settings only by special means (e.g., the use of a key, a code or a special tool or by breaking or removing a seal) or not.

2.2.2.3 Assessment of software-controlled detectors

Purpose of the assessment

Assessment of the suitability of the execution and documentation of the software (see EN 54-22, clause 5.3.3).

Assessment method

See EN 54-22, clause 5.3.3.

Expression of results

It shall be indicated in the ETA whether the characteristics in accordance with EN 54-22, clause 4.3.3, apply.

2.2.2.4 Sensing element fault

Purpose of the assessment

To ensure that faults on the sensing element which may prevent the proper function of the RLTHD are monitored and signalled (see EN 54-22, clause 5.3.4.1).

Assessment method

See EN 54-22, clause 5.3.4.2.

Expression of results

It shall be indicated in the ETA whether fault conditions were detected and signalled within 300 s.

2.2.2.5 On-site adjustment of response behaviour

Purpose of the assessment

Assessment that on-site settings can only be made using code or special tools (see EN 54-22, clause 5.3.5).

Assessment method

Visual inspection (see EN 54-22, clause 5.3.5).

Expression of results

It shall be indicated in the ETA whether or not on-site settings can only be made using a code or special tools.

2.2.2.6 Maximum ambient temperature test (sensing element)

Purpose of the assessment

To demonstrate Assessment of the ability of the RLTHD to function correctly even if the sensing element is exposed to high ambient temperature appropriate to the anticipated service temperature (see EN 54-22, clause 5.3.6.1).

Assessment method

Stress over 16 hours in the heating chamber (see EN 54-22, clauses 5.3.6.2 and 5.3.6.3).

Expression of results

It shall be indicated in the ETA whether or not the detector works correctly even at the high ambient temperatures as defined in EN 54-22, clauses 5.3.6.2 and 5.3.6.3.

2.2.3 Tolerance to supply voltage

2.2.3.1 Variation in supply parameters

Purpose of the assessment

To show that within the specified range(s) of the supply parameters (e.g., voltage), the sensitivity of the RLTHD is not unduly dependent on these parameters (see EN 54-22, clause 5.4.1.1).

Assessment method

The response time of the RLTHD shall be measured at the upper and lower limits of the supply parameter (e.g., voltage) range(s) specified by the manufacturer using the heat tunnel (see EN 54-22, clause 5.4.1.2).

Expression of results

The ratio of the maximum to minimum response time at the upper and lower limits of the supply parameter shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.3.2 Low voltage fault

Purpose of the assessment

To show that the sensor control unit is able to signal a fault condition when its input power supply falls below the minimum voltage specified by the manufacturer (see EN 54-22, clause 5.4.2.1).

Assessment method

Falling below the minimum voltage (see EN 54-22, clause 5.4.2.2).

Expression of results

It shall be indicated in the ETA whether or not the sensor control unit is able to signal a fault condition when its input power supply falls below the minimum voltage specified by the manufacturer.

2.2.4 Performance parameters under fire conditions

2.2.4.1 Fire sensitivity for room protection application

Purpose of the assessment

To show that the RLTHD (for room protection application) has, depending on its classification, an adequate sensitivity to the heat release of a real test fire as required for general application in fire detection systems (see EN 54-22, clause 5.5.1.1).

Assessment method

Test fires in the fire test room (see EN 54-22, clauses 5.5.1.2 to 5.5.1.7).

Expression of results

It shall be indicated in the ETA whether the response times in accordance with EN 54-22, table 4, are met.

2.2.4.2 Static response temperature test

Purpose of the assessment

To show that the RLTHD has, depending on its classification, an adequate sensitivity to a slow rate of rise of temperature (see EN 54-22, clause 5.5.2.1).

Assessment method

a) For non-integrating RLTHD: Test in the heat tunnel (see EN 54-22, clause 5.5.2.2).
b) For integrating RLTHD: Test in the heat chamber (see EN 54-22, clause 5.5.2.3)

Expression of results

It shall be indicated in the ETA whether the detector respond between the minimum and maximum static response temperatures as given in EN 54-22, clause 4.1.2, according to the class of the detector.

2.2.5 Durability of nominal activation conditions/sensitivity

2.2.5.1 Temperature resistance

2.2.5.1.1 Dry heat (operational) test for sensor control unit

Purpose of the assessment

To demonstrate the ability of the sensor control unit to function correctly at high ambient temperatures appropriate to the anticipated service environment (see EN 54-22, clause 5.6.1.1.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group according to the intended use of the product for a period of 16 hours (see EN 54-22, clauses 5.6.1.1.2 to 5.6.1.1.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during the period of the temperature increasing up to the stabilization temperature or during the stabilized period.

It shall be indicated in the ETA whether an alarm was generated during the functional test in accordance with EN 54-22, clauses 5.6.1.1.5 and 5.6.1.1.6.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.1.2 Dry heat (endurance) for sensor control unit and sensing element

Purpose of the assessment

To demonstrate, the ability of the RLTHD sensor control unit and sensing element to withstand long-term ageing effects (see EN 54-22, clause 5.6.1.2.1).

Assessment method

The conditioning shall be applied to the specimen in accordance with the applicable environmental group for a period of 21 days (see EN 54-22, clauses 5.6.1.2.2 to 5.6.1.2.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given after powering the sensor control unit together with the sensing element at the end of the conditioning and recovery periods.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.1.3 Cold (operational) for sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD to function correctly even if the sensing element is exposed to low ambient temperatures appropriate to the anticipated service environment (see EN 54-22, clause 5.6.1.3.1).

Assessment method

The conditioning shall be applied to the sensing element in accordance with the applicable environmental group for a period of 16 hours (see EN 54-22, clauses 5.6.1.3.2 to 5.6.1.3.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during the period of the temperature decreasing up to the stabilization temperature or during the stabilized period.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.1.4 Cold (operational) for sensor control unit

Purpose of the assessment

To demonstrate the ability of the RLTHD sensor control unit to function correctly at low ambient temperatures appropriate to the anticipated service environment (see EN 54-22, clause 5.6.1.4.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for a period of 21 days (see EN 54-22, clauses 5.6.1.4.2 to 5.6.1.4.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during the period that the temperature is decreasing to the stabilization temperature or during the stabilized period.

It shall be indicated in the ETA whether an alarm was generated during the functional test in accordance with EN 54-22, clause 5.6.1.4.6.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.2 Humidity resistance

2.2.5.2.1 Damp heat, steady state (endurance) for sensor control unit and sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD (sensor control unit and sensing element) to withstand the long-term effects of humidity in the service environment (e.g., changes in electrical properties of materials, chemical reactions involving moisture, galvanic corrosion etc., see EN 54-22, clause 5.6.2.1.1).

Assessment method

The conditioning shall be applied to the sensor control unit and the sensing element in accordance with the applicable environmental group for a period of 21 days (see EN 54-22, clause 5.6.2.1.2 to 5.6.2.1.5).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given after powering the RLTHD at the end of the conditioning and recovery periods.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.2.2 Damp heat, cyclic (operational) for sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD to function correctly even if the sensing element is exposed to high relative humidity which may occur for short periods in the anticipated service environment (see EN 54-22, clause 5.6.2.2.1).

Assessment method

The conditioning shall be applied to the sensing element in accordance with the applicable environmental group for two cycles (see EN 54-22, clauses 5.6.2.2.2 to 5.6.2.2.7).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during the conditioning and the following recovering period.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.2.3 Damp heat, cyclic (operational) for sensor control unit

Purpose of the assessment

To demonstrate the ability of the RLTHD sensor control unit to function correctly at high relative humidity which may occur for short periods during the anticipated service environment (see EN 54-22, clause 5.6.2.3.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for two cycles (see EN 54-22, clauses 5.6.2.3.2 to 5.6.2.3.7).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during the conditioning and the following recovering period.

It shall be indicated in the ETA whether an alarm was generated during the functional test in accordance with EN 54-22, clause 5.6.2.3.7.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.2.4 Damp heat, steady state (operational) for sensor control unit

Purpose of the assessment

To demonstrate the ability of the sensor control unit to function correctly at high relative humidity (without condensation) which may occur for short periods in the service environment (see EN 54-22, clause 5.6.2.4.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for a period of 4 days (see EN 54-22, clauses 5.6.2.4.2 to 5.6.2.4.7).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during the conditioning and the following recovering period.

It shall be indicated in the ETA whether an alarm was generated during the functional test in accordance with EN 54-22, clause 5.6.2.4.7.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.2.5 Damp heat, cyclic (endurance) for sensor control unit and sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD to withstand the long-term effects of high humidity in the service environment (e.g., changes in electrical properties of materials, chemical reactions involving moisture, galvanic corrosion, etc.; see EN 54-22, clause 5.6.2.5.1).

Assessment method

The conditioning shall be applied to the sensor control unit and the sensing element in accordance with the applicable environmental group for 6 cycles (see EN 54-22, clauses 5.6.2.5.2 to 5.6.2.5.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given after powering the RLTHD at the end of the conditioning and recovery periods.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3 Shock and vibration resistance

2.2.5.3.1 Shock (operational) for sensor control unit

Purpose of the assessment

To demonstrate the immunity of the RLTHD sensor control unit to mechanical shocks, which are likely to occur, albeit infrequently, in the anticipated service environment (see EN 54-22, clause 5.6.3.1.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for 6 pulses per direction (see EN 54-22, clauses 5.6.3.1.2 to 5.6.3.1.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during conditioning and the further 2 min.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3.2 Impact (operational) for sensor control unit

Purpose of the assessment

To demonstrate the immunity of the RLTHD sensor control unit to mechanical impacts upon its surface, which it may sustain in the normal service environment, and which it can reasonably be expected to withstand (see EN 54-22, clause 5.6.3.2.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for 3 impacts per point (see EN 54-22, clauses 5.6.3.2.2 to 5.6.3.2.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during conditioning and the further 2 min.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3.3 Impact (operational) for sensing element

Purpose of the assessment)

To demonstrate the ability of the RLTHD to function correctly even if the sensing element is exposed to mechanical impacts upon its surface, which it may sustain in the normal service environment, and which it can reasonably be expected to withstand (see EN 54-22, clause 5.6.3.3.1).

Assessment method

The conditioning shall be applied to the sensing element in accordance with the applicable environmental group for 1 impact (see EN 54-22, clause 5.6.3.3.2 to 5.6.3.3.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during conditioning and the further 2 min.

There might be visible distortion to the sheath of the sensing element where it was impacted. Visible cracking or cutting of the sheath shall be indicated in the ETA.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3.4 Vibration, sinusoidal (operational) for sensor control unit

Purpose of the assessment

To demonstrate the immunity of the RLTHD sensor control unit to vibration at levels considered appropriate to the normal service environment (see EN 54-22, clause 5.6.3.4.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for 1 sweep cycle per axis (see EN 54-22, clauses 5.6.3.4.2 to 5.6.3.4.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during conditioning.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3.5 Vibration, sinusoidal (operational) for sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD to function correctly even if the sensing element is exposed to vibration at levels considered appropriate to the normal service environment (see EN 54-22, clause 5.6.3.5.1).

Assessment method

The conditioning shall be applied to the sensing element in accordance with the applicable environmental group for 1 sweep cycle per axis (see EN 54-22, clauses 5.6.3.5.2 to 5.6.3.5.6).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given during conditioning.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3.6 Vibration, sinusoidal (endurance) for sensor control unit

Purpose of the assessment

To demonstrate the ability of the RLTHD sensor control unit to withstand the long-term effects of vibration at levels appropriate to the service environment (see EN 54-22, clause 5.6.3.6.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for 20 sweep cycles per axis (see EN 54-22, clauses 5.6.3.6.2 to 5.6.3.6.5).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given after powering the RLTHD at the end of the conditioning.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.3.7 Vibration, sinusoidal (endurance) for sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD sensing element to withstand the long-term effects of vibration at levels appropriate to the service environment (see EN 54-22, clause 5.6.3.7.1).

Assessment method

The conditioning shall be applied to the sensing element in accordance with the applicable environmental group for 20 sweep cycles per axis (see EN 54-22, clauses 5.6.3.7.2 to 5.6.3.7.5).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given after powering the RLTHD at the end of the conditioning.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.4 Corrosion resistance

2.2.5.4.1 Sulphur dioxide (SO_2) corrosion (endurance) for sensing element

Purpose of the assessment

To demonstrate the ability of the RLTHD sensing element to withstand the corrosive effects of sulphur dioxide as an atmospheric pollutant (see EN 54-22, clause 5.6.4.1.1).

Assessment method

The conditioning shall be applied to the sensing element in accordance with the applicable environmental group for 21 days (see EN 54-22, clauses 5.6.4.1.2 to 5.6.4.1.5).

Expression of results

It shall be indicated in the ETA whether an alarm or fault signal was given after powering the RLTHD at the end of the conditioning and recovery periods.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.4.2 Sulphur dioxide (SO_2) corrosion (endurance) for sensor control unit

Purpose of the assessment

To demonstrate the ability of the RLTHD sensor control unit to withstand the corrosive effects of sulphur dioxide as an atmospheric pollutant (see EN 54-22, clause 5.6.4.2.1).

Assessment method

The conditioning shall be applied to the sensor control unit in accordance with the applicable environmental group for 21 days (see EN 54-22, clauses 5.6.4.2.2 to 5.6.4.2.5).

Expression of results

It shall be indicated in the ETA whether no alarm or fault signal was given after powering the RLTHD at the end of the conditioning and recovery periods.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.5.5 Electrical stability

2.2.5.5.1 Electromagnetic compatibility (EMC), immunity tests (operational)

Purpose of the assessment

Assessment of functionality in the event of electromagnetic interference.

Assessment method

The following EMC immunity tests as specified in EN 50130-4 shall be carried out (see EN 54-22, clauses 5.6.5.1.2 to 5.6.5.1.3):

a) electrostatic discharge;
b) radiated electromagnetic fields;
c) conducted disturbances induced by electromagnetic fields;
d) fast transient bursts;
e) slow high energy voltage surges.

Expression of results

It shall be indicated in the ETA whether the criteria for compliance specified in EN 50130-4 have been met.

It shall be indicated in the ETA whether no alarm or fault signal was given during conditioning.

The ratio of the maximum to minimum response time shall be indicated in the ETA for the temperature increase rate of 3 K min^{-1}.

2.2.6 Reaction to fire

The components of the RLTHD (except electronic or electric components, e.g., sensors, batteries, plates / blanks etc.) shall

- either be tested, using the method(s) relevant for the corresponding reaction to fire class in accordance with EN 13501-1 (see option “e)" below),
- or be assessed without testing (see options “a)" to “d)” below).

The components of RLTHD shall be classified in accordance with Delegated Regulation (EU) 2016/364 in connection with EN 13501-1 (except in case of option “f)” below). The worst reaction to fire class assessed for the different components applies for the RLTHD. Both the performance of the RLTHD as well as the performance of the individual components shall be stated in the ETA together with those conditions and parameters (see options below) for which the respective classification is valid.

Depending on the type of the component one of the following methods of assessment shall be used:

a) The component is considered to satisfy the requirements of class A1 of the reaction-to-fire performance in accordance with the Commission Decision 96/603/EC, as amended by Commission Decisions 2000/605/EC and 2003/424/EC, without the need for testing on the basis of it fulfilling the conditions set out in that Decision and its intended use being covered by that Decision.

Therefore, when the conditions referred to above are fulfilled, the performance of the component is A1 which shall be given in the ETA.

b) The component is considered to satisfy the requirements for performance of the respective class of the essential characteristic reaction to fire in accordance with one of the Commission Decisions or Delegated Acts related to a classification without the need for further testing (CWFT Decisions) on the basis of it fulfilling the conditions set out in the respective Decision or Delegated Act and its intended use being covered by that Decision or Delegated Act.

Therefore, the performance depending on its type and the conditions under which the component is used shall be taken from the respective Decision or Delegated Act applicable for the component.

c) The component is covered by another harmonised product specification. In this case, the reaction to fire performance shall be taken from its own Declaration of Performance, if declared, and stated in the ETA as long as the conditions for which the classification is valid covers the application of the component in the RLTHD.

d) The component is considered to satisfy the requirements for small components in accordance with all of the following provisions:

- a mass ≤ 50 g,
- a size of ≤ 50 mm x ≤ 50 mm or a diameter of ≤ 57 mm (equal area size as for a rectangular size of ≤ 50 mm x ≤ 50 mm), and
- a distance ≥ 200 mm to similar components when forming part of a composite product and being situated on the surface of a product made of material of classes B, C, D, or E,
  or
  completely embedded all-round in non-melting material of class A1 when used as small connecting part of a product consisting of various components and without any possibility to ignite or to propagate fire.

In this case the component can be considered as a small component and its reaction to fire performance can be neglected and doesn't need to be tested and classified separately.

Where the conditions are not met regarding the distance to other similar components or the all-round covering by non-melting A1 materials, the component shall be tested as part of the relevant composite product.

The ETA shall state those components being considered as small components.

e) If none of the above cases a) to d) applies and testing of the component is necessary, the respective component shall then be tested at least with the test method EN ISO 11925-2 (due to the limited size of the components) for the corresponding reaction to fire classes in accordance with EN 13501-1. The following provisions shall apply for the relevant tests:

The necessary tests in accordance with EN ISO 11925-2 shall be performed with edge exposure as well as with surface exposure on specimens as follow:

i) flat boards made from the material of the respective component or cut sections of this component, mounted in a free-hanging test position without any substrate behind,
ii) flat boards made from the material of the respective component or cut sections of this component, mechanically fixed on a standard steel sheet in accordance with EN 13238, if tests fail with a specimen configuration according to "i)".

If required, the necessary tests in accordance with EN 13823 (SBI) shall be performed on specimens of the relevant component with one of the following options depending on its end-use conditions in the product:

iii) flat boards made from the material of the relevant component, which are placed side by side with closed butt joints on a sub-construction made of vertically positioned linear metal profiles (Z- or I-profiles are recommended) and are mounted in a free-standing test position (40 mm distance to the backing board of the SBI test rig), Each of the flat boards shall be mechanically fixed to the

profiles of the sub-construction with four small metal nails or screws (one fixing mean in each corner of the boards),

iv) flat boards made from the material of the relevant component, which are placed side by side with closed butt joints on a standard substrate in accordance with EN 13238 (aluminium or steel sheet is recommended) and are placed directly in front of the backing board of the SBI test rig. Each of the flat boards shall be mechanically fixed to the standard substrate with four small metal nails or screws (one fixing mean in each corner of the boards).

The following product parameters shall be considered for the components when preparing the test specimens and executing the relevant reaction to fire tests:

- variations of a product family (as defined by a combination of certain raw materials and certain type of production process),
- highest and lowest thickness, if relevant,
- highest and lowest density, if relevant.

The results of tests considering the aforementioned parameters in fully are valid for:

- all variations of the defined product family,
- the tested thickness or the whole range between those thickness values tested,
- the tested density or the whole range between those density values tested.

In the ETA the reaction to fire class shall be given together with the information that EN 13501-1 has been used as a basis for the classification.

f) If option "e)" is not applicable (e.g., due to lower sizes of the components than prescribed in EN ISO 11925-2 or EN 13823), the fire hazard of those components shall be tested and assessed in accordance with test standard EN 60695-11-10. The tests can be done either with test method A "horizontal" or with test method B "vertical" or with both methods. In addition to the provisions of the test standard, the aforementioned provisions in clause 2.2.6 e) regarding the relevant product parameters apply analogously for the tests in accordance with EN 60695-11-10.

The class(es) obtained as results of tests in accordance with EN 60695-11-10 shall be stated in the ETA for each relevant component together with the information about EN 60695-11-10 being used as a basis for the classification. Additionally, the information shall be given that no performance was assessed ('NPA') in accordance with EN 13501-1 for these components.

2.2.7 Content, emission and/or release of dangerous substances

The performance of the resettable line-type heat detectors regarding the emissions and/or release and, where appropriate, the content of dangerous substances shall be assessed on the basis of the information provided by the manufacturer[3] after identifying the release scenarios taking into account the intended use of the product and the Member States where the manufacturer intends his product to be made available on the market.

The identified intended release scenarios for this product and intended use with respect to dangerous substances are:

IA 1: Product with direct contact to indoor air,

IA 2: Product with indirect contact to indoor air (e.g., covered products) but possible impact on indoor air.

- **SVOC and VOC**

For the intended use covered by the release scenario(s) IA1 and/or IA2 semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) shall be determined in accordance with EN 16516. The loading factor to be used for emission testing is 0,007 m^2/m^3.

The resettable line-type heat detectors to be tested shall be assembled according to the envisaged application, with all components being part of the test specimen. The installation should be in accordance with the manufacturer's product installation instructions or (in absence of such instructions) the usual practice of installation. Once the test specimen has been produced, as described above, it shall immediately be placed in the emission test chamber. This time shall be considered the starting time of the emission test.

The test results in accordance with EN 16516 shall be reported for the relevant parameters (e.g., chamber size, temperature and relative humidity, air exchange rate, loading factor, size of test specimen, conditioning, production date, arrival date, test period, test result) after 3 and 28 days testing.

The product performance shall be stated in the ETA expressed in [unit mg/m^3 or $\mu g/m^3$] with regard to the loading factor used.

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3 The manufacturer may be asked to provide to the TAB the REACH related information which shall accompany the DoP (cf. Article 6(5) of Regulation (EU) No 305/2011).
The manufacturer is **not** obliged to:
- to provide the chemical constitution and composition of the product (or of constituents of the product) to the TAB, or
- to provide a written declaration to the TAB stating whether the product (or constituents of the product) contain(s) substances which are classified as dangerous in accordance with Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the SGDS, taking into account the installation conditions of the construction product and the release scenarios resulting from there.

Any information provided by the manufacturer regarding the chemical composition of the products is not to be distributed to EOTA, to other TABs or beyond.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is Commission Decision 96/577/EC, as amended by Commission Decision 2002/592/EC.

The system is 1.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

Table 3.2.1 Control plan for the manufacturer; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed test plan]					
1	Checking of the incoming materials and components – precise designation and relevant characteristics of the material or component – if possible, references to European and/or international standards or relevant specifications; inspection of the delivery receipt	Control plan	Compliance with required materials and/or components according to control plan as agreed between the manufacturer and the TAB	Control plan	Every delivery
2	Checking while production	Functional test	Passed	100%	Every product
3	Final controls and checks; testing of the completed kit	Functional test	Passed	100%	Every product

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance for RLTHD are laid down in Table 3.3.1.

Table 3.3.1 Control plan for the notified body; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control					
1	Notified Body will ascertain that the factory production control with the staff and equipment are suitable to ensure a continuous and orderly manufacturing of the RLTHD.	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	According to Control plan	According to Control plan	When starting the production or a new line
Continuous surveillance, assessment and evaluation of factory production control					
2	The Notified Body will ascertain that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan.	Verification of the controls carried out by the manufacturer as described in the control plan agreed between the TAB and the manufacturer with reference to the raw materials, to the process and to the product as indicated in Table 3.2.1	According to Control plan	According to Control plan	2/year

4 REFERENCE DOCUMENTS

EN 54-1:2021	Fire detection and fire alarm systems - Part 1: Introduction
EN 54-22:2015+A1:2020	Fire detection and fire alarm systems – Part 22: Resettable line-type heat detectors
EN 13238:2010	Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates
EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
EN 13823:2020+A1:2022	Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item
EN 16516:2017+A1:2020	Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air
EN 50130-4:2011+A1:2014	Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder, hold up, CCTV, access control and social alarm systems
EN 60695-11-10:2013+AC:2014	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods
EN ISO 11925-2:2020	Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test (ISO 11925-2:2020)