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PROPERTY INSURANCE COMMITTEE Prevention Specifications

CEA Specifications for spark-separation systems Requirements and test methods for spark-separation devices

CEA 4037: April 2002 (en)

(EFSAC endorsed)

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1 Scope

These CEA Specifications specify requirements and test methods for spark-separation devices (SSD) of spark-separation systems.

SSDs are installed in the duct work to be protected.

Their aim is, upon a signal from a control device, to release a mechanism to separate particles from the transporting air stream.

These CEA Specifications specify requirements and test methods for SSDs, which

- in specified dependence on an electric-triggering signal from an electric control device and using a pneumatic supplied support device, by the release of a pre-loaded spring adopt a separating condition, in which they separate solid particles from the transporting air stream and deposit them in a container, which is part of the SSD, and
- leave this separating condition again manually or automatically and return to the stand-by condition.

For SSDs of other design, other requirements and specific test methods may be necessary.

2 Normative references and abbreviations

2.1 Normative references

These CEA Specifications incorporate by dated or undated references provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to these CEA Specifications only when incorporated in them by amendment or revision. For undated references, the latest edition of the publication referred to applies.

- CEA Specifications for Spark-extinguishing Systems, Planning and Installation

2.2 Abbreviations

SSD Spark-separation device

3 Definitions

For these CEA Specifications, the following definitions apply:

Separating Condition: Condition of the SSD, in which solid particles are separated from the transporting air stream.

Stand-by Condition: Condition of the SSD, in which the transporting air stream and particles can pass through the duct work unhindered.

Delay time (total): Time period between spark detection and the start of the full separating condition.

Note: The delay time (total) consists of the delay time (electrical) and the delay time (mechanical) and is used in the installation of spark-separation systems for the calculation of the distance between spark detector and SSD.

Delay time (electrical): Time period between spark detection and triggering of the SSD.

Note: This time period shall not exceed 10 ms.

Delay time (mechanical): Time period between triggering of the SSD and start of the full separating condition.

Note: The delay time (mechanical) specified by the manufacturer is verified on the basis of measuring values with a safety margin taken into consideration and documented in the certificate of approval of the SSD.

4 Requirements

4.1 General

4.1.1 SSDs may incorporate the following components:

- Damper
- Container

4.2 Technical documentation and specifications

The manufacturer shall supply the following documents for each SSD:

- production documentation
- function documentation
- installation documentation

The manufacturer shall specify the following for each SSD:

- diameter of the duct work to be protected (range)
- permissible transport velocity (range)
- permissible density of transported material (range)
- maximum permissible static pressure in stand-by condition
- maximum permissible static pressure in separating condition
- flow resistance coefficient in stand-by condition
- flow resistance coefficient in separating condition
- delay time (mechanical) or delay time (total)

Note: If the delay time (total) is specified, the delay time (mechanical) is calculated by subtraction of 10 ms.

- ambient temperature (range)
- components for the electric triggering
- maximum stand-by time
- minimum allowable time between two operations (resetting time)
- triggering voltage of electrical control device (range)
- supply pressure (range)

The specified delay time (mechanical) or delay time (total) shall not exceed 490 ms or 500 ms respectively.

4.3 Marking

The manufacturer shall mark each SSD by an enduring and easily read type designation plate with the following information:

- manufacturer's name or trademark
- type designation
- year of manufacture
- identification of the manufacturing plant, if the manufacturer has more than one plant
- number of the certificate of approval
- maximum permissible static pressure in stand-by condition
- supply pressure
- permissible ambient temperature (range)

4.4 Construction

4.4.1 Damper

The damper shall be designed to ensure the complete diversion of the air stream during the separating condition. After operation the damper shall remain closed. Monitoring of the position of the damper during the separating condition shall be possible.

4.4.2 Container

If provided, the container shall be made of metal. It must be ensured that separated particles cannot escape, except through the means provided for this purpose. In addition, the container shall be designed in such a way that ignited material cannot cause any danger. Monitoring of the filling level shall be possible, if the container is specified for operation during several separation periods.

4.5 Delay time (mechanical)

When the SSD is tested in accordance with 5.5, the time between the triggering of the SSD and the start of the full-separating condition shall not exceed 80% of the time specified by the manufacturer.

4.6 Reliability

When tested according to 5.6, the test sample shall operate correctly. After the test according to 5.6, no signs of wear shall be detectable by a visual check. In a subsequent test according to clause 5.5, the requirements of 4.5 shall be fulfilled.

5 Tests

5.1 Test conditions

The test samples shall be mounted for the test according to the technical description. The tests shall be carried out at a temperature of (25 ± 10) °C, if not stated otherwise for individual tests.

If not stated otherwise, the tolerance for all test parameters is $\pm 5\%$.

The tests are conducted without air flow.

If it can be assumed, that air flow has important influence, the tests will be done with air flow as specified in the manufacturer's documentation.

5.2 Test samples and order of the tests

Before the tests with test samples, an examination of the technical documentation according to clause 5.3 shall be carried out.

When testing one SSD, one test sample is necessary.

The order of the tests is:

1. Compliance (5.4)
2. Delay time (mechanical) (5.5)
3. Reliability (5.6)

For the test of a series of SSDs, a suitable test schedule as well as the number of test samples is determined.

5.3 Examination of the technical documentation

This test relates to the requirements of the clauses 4.1, 4.2, 4.3 and 4.4.

A visual check of the technical documents shall see:

- whether the technical documentation is complete and
- whether the required specifications are made and
- whether the constructive requirements testable by means of the technical documentation are fulfilled and
- whether the specified delay time (mechanical) or delay time (total) does not exceed 490 ms or 500 ms respectively.

5.4 Compliance test

A visual check and a check of dimensions shall determine, whether the test sample complies with the technical documentation (drawings, part lists, functional descriptions, operating and installation instructions) and if it corresponds to these CEA Specifications.

5.5 Delay time test (mechanical)

This test relates to the requirements in clauses 4.5 and 4.6.

Note: The delay time (mechanical) specified by the manufacturer is verified on the basis of measuring values with a safety margin taken into consideration and documented in the certificate of approval of the SSD.

SSDs for indoor use only shall be tested at $(25 \pm 10) ^\circ\text{C}$. SSDs for indoor and outdoor use shall be tested at $(25 \pm 10) ^\circ\text{C}$ and at $(-20 +0/-5) ^\circ\text{C}$.

Before the test, the operational SSD shall be conditioned in the stand-by condition for the maximum stand-by time as specified by the manufacturer according to 4.2.

Subsequently the SSD is triggered, and the electrical-triggering voltage and the time from the electrical triggering to the signal 'Separation' of the monitoring function of the switch position of the SSD are measured.

During the test, the figures for electrical-triggering voltage and supply pressure correspond to the lower threshold values of the ranges specified by the manufacturer.

After operation, reset the SSD and repeat the test as described above immediately.

5.6 Reliability test

This test relates to the requirements in clause 4.6.

Test the SSD using nominal triggering voltage and supply pressure.

Automatic resetting SSDs shall be triggered 3000 times. Manual reset SSDs shall be triggered 300 times.

During the test the test sample must operate correctly. Subsequently, the test sample is examined for wear and tested in accordance with clause 5.5.

5.7 Other tests

If required due to particular designs, new methods of manufacture or special applications, additional tests shall be carried out in agreement with the manufacturer.