

K21045
SCP08/01
2023-04-04

Specific Certification Program Fire Protection Systems for Products

Glass bulb activators for Solid Bound Compound (SBC) -
generators



Trust
Quality
Progress

Preface

This specific certification program has been accepted by the Kiwa Board of Experts Fire Safety, in which all relevant parties in the field of Fire Protection Systems are represented. The Board of Experts also supervises the certification activities and where necessary requires the evaluation guideline to be revised. All references to Board of Experts in this evaluation guideline pertain to the above mentioned Board of Experts.

This certification program will be used by Kiwa in conjunction with the Kiwa Regulations for Certification within the context of Certification Scheme K21045 "Fire Protection Systems".

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The use of this evaluation guideline by third parties, for any purpose whatsoever, is only allowed after a written agreement is made with Kiwa to this end.

Validation

This specific certification program within the context of certification scheme K21045 has been validated by the Director Fire Safety and Security of Kiwa on 2023-04-04

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1 Introduction

1.1 General

This specific certification program includes all relevant requirements which are employed by Kiwa when dealing with specific applications.

This specific certification program is a first version and shall be used in context with product certification scheme K21045 "Fire Protection Systems".

Fire Protection Systems (FPS) can be based on components being generators containing a Solid Bound Compound (SBC). This SBC is the base material for the extinguishing medium.

To activate the Fire Protection System should the SBC be expelled out of the generator in a physical form designed to extinguish or control the fire.

This first activation of the generator is an activation element that produces heat in short period to start up the process of the SBC in another physical composition.

The generator needs proper activation device according to EN15726-1 - Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 1: Requirements and test methods for components.

Paragraphs 4.4, 5.12 and 7.13 "Activation device" specify the requirements in general.

These generators are one of the elements for a Fire Protection System.

A Fire Protection System (FPS) needs a proper Fire Detection System (FDS) according to EN15726-1 - Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 1: Requirements and test methods for components.

Normally are electrical activation devices used for Fire Protection Systems according to Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 2: Design, installation and maintenance.

The Fire Protection System are equipped with control and indicating equipment according to EN12094-1 - Fixed firefighting systems - Components for gas extinguishing systems - Part 1: Requirements and test methods for electrical automatic control and delay devices" is specific designed for gas extinguishing systems.

For simple fire protection such as for object protection requires a simple method of fire detection. In this specific certification program is the sprinkler method used.

Note.

This specifies certification program specifies the requirements for such a solution. The requirements are not detailed in the standard EN15726-1.

This specific certification program details the requirements for activation based on existing glass bulb technology used for sprinkler systems. This principle is only to be used for object protection based on SBC-generators.

1.2 Field of application / scope

The functional and performance requirements for glass bulb technology used in conjunction with SBC -generators. This principle is only to be used for object protection based on SBC - generators in an controlled chloride environment.

Based on the results of this test protocol in this specific certification program is additional listing possible.

1.3 Acceptance of test reports provided by the supplier
See TIC scheme K21045.

1.4 Quality declaration
See TIC scheme K21045.

2 Terms and definitions

See TIC scheme K21045.

2.1 Additional terms and definitions

2.1.1 ***Glass bulb thermo activator***

Glass bulb thermos activator are thermally actuated release elements for automatic sprinklers, smoke vents, fire dampers and other release devices such as in this scope for SBC - generators. A hermetically sealed liquid in the glass bulbs expands with rising temperatures breaking the bulbs into small fragments at a predetermined release temperature.

Source; EN 12559-1.

3 Procedure for granting a product certificate

See TIC scheme K21045.

4 Setup of this specific certification program

4.1 General

This chapter contains the setup for the specification certification program.

For the performance of its certification work, Kiwa is bound to the requirements as included in EN-ISO/IEC 17065 “Conformity assessment - Requirements for bodies certifying products, processes and services” and certification scheme K21045.

This program describes a test plan for glass bulb activators and its housing in conjunction with the SBC-generator.

It describes the test requirements and/or laboratories to be used for the testing, identifies the tests to be performed and provides in minimal schedules for test activities.

5 Requirements and testing of the product

5.1 General

These chapters describe the requirements that the products, applied in the processes stated, shall meet. These requirements are part of the technical specification of the process, which is recorded in the product certificate for the Fire Protection System equipment.

Note.

1. In the setup of this component is it the intention that the manufacturer of this solution makes use of the approved activators of the certified SBC generators. If not shall the new type activator be tested and product certified according to the applicable standard such as EN15276-1.

2. The setup of the requirements is such that the life time of this component is the same as of the SBC generator. According to standard EN15726-1 is this 15 years.

5.2 Glass bulb certified product parts

The supplier of the SBC-generator shall supply Fire Detection Solution according to the parts in EN 12259-1 applicable for glass bulbs solutions. The heat rating of the glass bulb activator is the basis for the design of the solution in conjunction with the height of the protected compartment.

This is also possible based on the following standards:

ISO 6182-1 - Fire protection — Automatic sprinkler systems — Part 1: Requirements and test methods for sprinklers.

UL 199 - Standard for Automatic Sprinklers for Fire-Protection Service.

Note 3. In the setup of this component is it the intention that the manufacturer of this solution makes use of certified glass bulbs. If not shall the glass bulb be tested and product certified according to the applicable standard.

5.3 Housing of the glass bulb activator

The parts of housing including spring and pen of the glass bulb activator connected to the SBC-generator shall made of stainless steel

The type AISI 304 (XCrNi18-10 / UNS S30400) application of these housing has an limited scope for an indoor application in non-aggressive environments.

The specification of the indoor environment is:

Cl₂ should be equal or lower than 2 mg/l.

Cl should be equal or lower than 100 mg/l.

The type AISI 316 (X5CrNiMo17-12-2 / UNS 31600) application of these housing has an limited scope for an indoor application in non-aggressive environments.

The specification of the indoor environment is:

Cl₂ should be equal or lower than 3 mg/l.

Cl should be equal or lower than 200 mg/l.

Note.

4. In the setup of this component is stainless steel chosen as the basic material. The reason for this are its known mechanical characteristics such as:

- *Resistance to fire A1 based on EN13501-1;*
- *Resistance to corrosion and mechanical strength based on standards and literature.*

5. The spring in the housing shall be static and the construction with the pen and SBC activator shall be assessed and evaluated by the certification body for performance and endurance.

5.4 Determination of the detection speed in relation to the height

Per generator type is the coverage determined according to EN15276-1 - Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 1: Requirements and test methods for components.

This determined coverage is the bases for the determination of the detection speed based on EN 54-7 - Fire detection and fire alarm systems - Part 7: Smoke detectors - Point smoke detectors that operate using scattered light, transmitted light or ionization.

The Flaming plastics (polyurethane) fire (TF4) test in annex I of this standard is the requirement for determination of the detection speed.

The performance requirement is that the glass bulb has to be activated within 2 minutes in the compartment based on the coverage on the type generator. This based on the pre-burning limit in the tests for class A fires in EN15276-1.

The test is adapted for this specific requirements for this application:

- with a starting catalysator of 40 ml n-heptane as defined in EN15276-1. This catalysator is poured direct for the activation in one the corners of the mat(s) that is used to light the fire with a lighter;
- the mats are positioned in the middle of the floor on the compartment;
- the compartment has an opening for ventilation during the test. This opening has an opening of length 15 cm and width of 10 cm and 40 cm above the internal floor;
- a reference to the number of the mats in conjunction with the height of the compartment in relation to the coverage of the type generator. This is detailed in table 1;
- The thermocouples are situated on the following positions:
 - 3 thermocouples on top level at the ceiling of the compartment in different positions to control the temperature behaviour during this test;
 - 1 thermocouple on minus 10 cm and 1 thermocouple on minus 20 cm top level at the ceiling of the compartment.

This test has to be performed twice both with positive result.

The number of mats to be used during the test in relation to the height of the compartment is detailed below.

Height of the compartment in m	Number of mats
Less than 2,5	2 half
$> 2,5 \leq 4$	2
$> 4 \leq 6$	3
$> 6 \leq 9$	4
$> 9 \leq 12$	5

Table 1 – relation height compartment and number of mats (origin is NEN 2535)

Note 6. According to the standard EN15276-2 are multi criteria fire detectors to be used with these type of SBC-generators. The fire detection principle CO is most likely to be chosen based on the fire scenario. In this solution is the fire detection principle heat chosen. The generators are product certified based on a 2 minute pre-burning time. This test is to determine if the detection method in conjunction with the height of the coverage is matching this 2 minutes limit. Under

normal conditions is a height of 2,5 or 4 meters maximum in this type of solutions. In case of extra longitudinal situations such as non-occupiable cable shafts is a limit set.

6 Factory Production Control Fire Protection Components by Kiwa

See TIC- scheme K21045.

6.1 Additional requirements for these components

The certified manufacturer / supplier has all the afore-mentioned certificates of these products available in a components file with an up-to-date overview.

This file shall be checked yearly by the certified supplier to verify if all certificates are still valid. The afore-mentioned components shall be checked visually for a valid product certificate and proper specification and marking on the packaging.

6.2 Normalized products with product control mark

These materials shall be checked yearly by the certified supplier for the declared specifications, based on a declaration by the supplier or manufacturer of the normalized products with product control mark, as well as the visual check of material and/or packaging specifications.

7 Inspection of Fire Protection Systems by Kiwa

See TIC- scheme K21045.

8 Marking

8.1 General

See TIC scheme K21045.

8.2 Certification mark

See TIC scheme K21045.

9 Requirements in respect of the quality system

See TIC scheme K21045.

10 Summary of tests and inspections

See TIC scheme K21045.

11 Agreements on the implementation of certification

See TIC scheme K21045.

12 Titles of standards

12.1 Public law rules

See TIC scheme K21045.

12.2 Standards / normative documents

See TIC scheme K21045. Additional standards or standards in conjunction with this subject are shown below.

Number	Title	Version*
EN 15276-1	Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 1: Requirements and test methods for components	2019
EN 15276-2	Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 2: Design, installation and maintenance	2019
EN 10088-1	Stainless steels - Part 1: List of stainless steels	2014
EN 10088-2	Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes	2014
EN 10088-3	Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes	2014
ASTME 527 SAE J1086	Recommended Practice for Numbering Metals and Alloys	1990
EN 13501-1	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests	2019
EN 12094-1	Fixed firefighting systems - Components for gas extinguishing systems - Part 1: Requirements and test methods for electrical automatic control and delay devices" is specific designed for gas extinguishing systems.	2004
EN 12259-1/A1	Fixed firefighting systems - Components for sprinkler and water spray systems - Part 1: Sprinklers	1999/2001
EN 54-7	Fire detection and fire alarm systems - Part 7: Smoke detectors - Point smoke detectors that operate using scattered light, transmitted light or ionization	2018
ISO 6182-1	Fire protection — Automatic sprinkler systems — Part 1: Requirements and test methods for sprinklers	2021
UL 199	Standard for Automatic Sprinklers for Fire-Protection Service	2022

*) When no date of issue has been indicated, the latest version of the document is applicable for new systems. Kiwa shall inform the certificate holders about changes in version. For design, installation and maintenance is the version of standard applicable set in the basic design.