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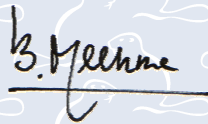
Product Certificate

NOFIQ Fire Detection and Extinguishing System

Based on inspections, as well as regularly performed checks by Kiwa, the products supplied by

NOFIQ Fire & Safety Systems B.V.

specified in this certificate and provided with the under "Marks" defined Kiwa-mark, may on delivery be relied upon to comply with the Kiwa Evaluation Guideline BRL-K21014/04 "for the Kiwa product certificate for aerosol fire-extinguishing systems for fire protection in enclosed compartments containing electrical components".



Bouke Meekma
Director Kiwa Nederland B.V.

This certificate is issued in accordance with the Kiwa-Regulations for Product Certification.

This certificate consists of 9 pages.
Publication of the certificate is allowed.

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NOFIQ Fire Detection and Extinguishing System

PRODUCTSPECIFICATION GENERAL

The requirements mentioned in this Evaluation Guideline are operated by Kiwa when handling a request or upkeep for the Kiwa product certificate (EN 45011) for aerosol fire-extinguishing systems for fire protection in enclosed compartments containing electrical components (aerosol fire-extinguishing system). This system is designed as an additional monitoring and fire-extinguishing system.

The system consists of the following components.

1. Fire-extinguishing component (FEC) containing:
 - a) Aerosol fire-extinguishing component for extinguishing;
 - b) Fire alarm extinguishing station for driving the aerosol fire-extinguishing component and other drivers;
 - c) Detection component for monitoring and guarding the object.
2. Signal repeater (HUB)
3. Alarm management system (AMS) with radio interface (AMS-HUB)

Component 1 can be used autonomously (standalone) as well, without using the components 2 and 3.

Alarm follow-up can be guaranteed by means of other communication equipment.

The communication equipment must meet the requirements from the standards PrEN 54-13, EN 54-18 and EN 54-21.

This communication equipment is usually provided by the alarm receiving station.

Application in conjunction with other systems

The application of components according to Evaluation Guideline BRL-K21014 in Fire detection and fire alarm systems according CEN/TS 54-14 "Fire detection and fire alarm systems - Part 14: Guidelines for planning, design, installation, commissioning, use and maintenance" is possible because the components certified according to Evaluation Guideline BRL-K21014 comply with the relevant European standards.

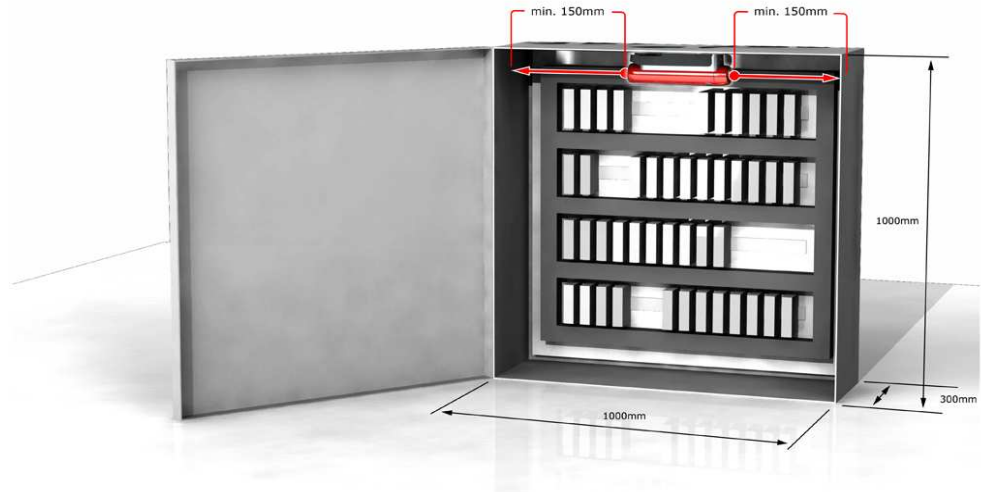
The connection between the components according Evaluation Guideline BRL-K21014 and the Fire detection and fire alarm systems according CEN/TS 54-14 (for the Netherlands NEN2535) has to be according to EN54-18 "Fire detection and fire alarm systems - Part 18: Input/output devices".

The maximum combined number of fire-extinguishing components (FEC) and signal repeaters (HUB) within one system is 511. Within a system configuration the transmission path between a fire-extinguishing component and the alarm management system is limited to a maximum of 32 signal repeaters (HUB). The system has to communicate on a licence-free frequency band (ISM frequency) for which wireless communication for alarm purposes is permitted. The aerosol fire-extinguishing system should be constructed in such a way that the radio connection as transmission path is carried out redundantly.

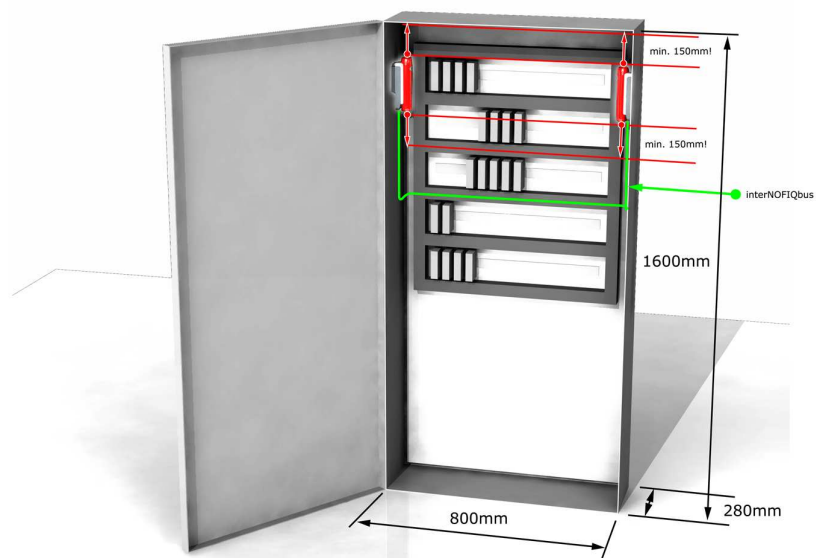
The system is tested and proven in the following dimensioning and projection. These dimensioning and projection fall within the scope of the product certificate. The number of fire-extinguishing components (FEC) needed for a specific object also determines the projection, i.e. the position and direction in which the FEC's must be mounted. When applying 1 FEC it will be placed in the middle of the object on the upper side, having the outflow openings pointing to the left and the right. Ensure that both outflow openings of the FEC have at least 15 cm of free outflow space in order to prevent damage to equipment. The antenna has to be connected to the FEC by means of an antenna extension cord. When applying 2 or more FEC's these are placed on the side of the object to be protected, having the outflow openings pointing upwards and downwards. Ensure that both outflow openings of the FEC have at least 15 cm of free outflow space in order to prevent damage to equipment. When applying more than 1 FEC in a cabinet these must be linked by means of a bus connection.

NOFIQ Fire Detection and Extinguishing System

PRODUCTSPECIFICATIONS FE20



The test cupboard for the FE20 with the standard projection for detection and extinguishing.



The test cupboard for the FE20 with the standard projection for detection and extinguishing.

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NOFIQ Fire Detection and Extinguishing System

De FE20 is tested under following conditions to determine if detection is within the requirements of Evaluation Guideline BRL-K21014.

The following conditions have been used:

- TF1, wood crib (source 7 according to BS 5852-2:1990).
- TF4, polyurethaan mats (comparable with NEN 2535:1996 and EN 54-7:2000).
- TF7, methylated spirit 85% (comparable with NEN 2535:1996).
- TF10, print with 5 resistors (comparable with NEN 2535:1996).

PRODUCTSPECIFICATIONS FE80

The tests for the FE80 are carried out in a test cabinet (D 0,8 m x B 1,60 (2 x 0,8 m) X H 2 m) as shown in the figure below.

The test cabinet has a transparent window in the middle of the door, so the test carried out inside the test cabinet can be observed visually.

The cabinet itself contains no electrical components. The cabinet has sufficient space for thermal propulsion.

The test cabinet 1 and 2 are provided with a ventilator with the following specifications (air speed with filter 55 m³/h, 230 V, 50/60 Hz, temperature range -10°C - + 55°C).

These ventilators (Rittal 3322.107) are placed at the bottom of the test cabinet and will blow air into the test cabinet.

At the upper side of each test cabinet an air grid is placed (Rittal 3322.207) with the same diameter as the ventilator for outflow of air and other gases. The test cabinets are connected to each other without an internal barrier.

These tests are conclusive for the standard projection belonging to this system.

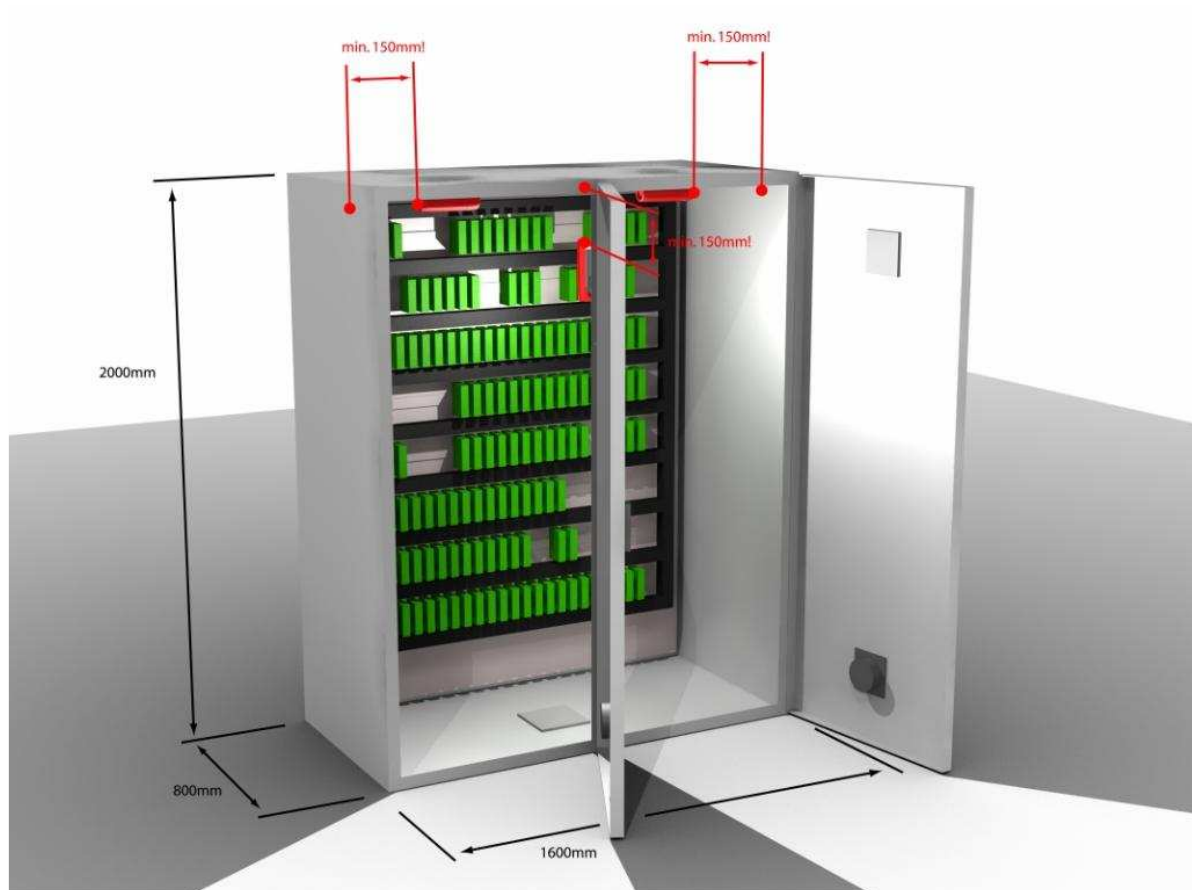
The FE80 is tested under following conditions to determine if detection is within the requirements of Evaluation Guideline BRL-K21014.

The following conditions have been used:

- TF1, wood crib (source 7 according to BS 5852-2:1990).
- TF4, polyurethaan mats 3 x 4 van 100 x 100 mm and thick 20 mm (comparable with NEN 2535:1996 and EN 54-7:2000).
- TF7, methylated spirit 85% (comparable with NEN 2535:1996).*
- TF10, print with 5 resistors (comparable with NEN 2535:1996).

*TF7 has a limited scope. For the scope TF 7 will detection be functional within 2 minutes with only one ventilator operational. This is for the specific use for fire detection of flammable liquids.

NOFIQ Fire Detection and Extinguishing System



The test cupboard for the FE80 with fixed projection for detection and extinguishing.

APPLICATION AND USE

Full title

The full title of this Evaluation Guideline is the Kiwa product certificate for aerosol fire-extinguishing systems with wireless communication to an alarm management system for fire protection in enclosed compartments containing electrical components (maximum 1500 Volts DC and 1000 Volts AC).

Product aim

The aerosol fire-extinguishing system should monitor the environment to be protected for fire phenomena by detecting these and then communicate with other equipment within the system with the purpose to alarm in an initial phase of fire, notify a receiving station for fire alarms, extinguish in the fire phase and control during a set period.

The application is primarily meant for objects that cannot be entered by humans and fall under the definition "un-enterable room".

More specifically the objective is as follows:

Early detection (with wireless fire alarm system with detection based on % CO and $\Delta T/T_{max}$) for fire sizes as stated in appendix 15. The extinguishing system should prevent an expansion of the fire outside the cabinet during the standing time of the extinguishing agent.

NOFIQ Fire Detection and Extinguishing System

The aerosol fire-extinguishing system is aimed for application in compartments such as:

- Switch cabinets;
- Computers;
- Meter boxes.

Starting-point in this is a standard projection (see appendices 15 and 16) for detection and for extinguishing. It therefore concerns a pre-engineered system. The installation of the aerosol fire-extinguishing system should be described in the supplier's manual. The users will be instructed in design, installation, acceptance and follow-up by means of a training by the supplier. For an integral safety concept, this training should be applied in combination with this Evaluation Guideline.

Explanation: If the detection system does not function, the system shall be activated by means of a thermal cord. If this thermal cord refuses, activation takes place based on the aerosols own activation temperature. The values must be declared in the product certificate of the aerosol-extinguishing agent as per Evaluation Guideline BRL-K23001. Additionally the product certificate must give insight in dimensioning of the system.

The aerosol fire-extinguishing system should be able to function in an indoor environment meeting the following conditions.

| Conditions | FEC | HUB | AMS |
|-------------------------------------------------|-----------------|----------------|----------------|
| Use | | | |
| Temperature | -10°C to +45°C# | -10°C to +60°C | -10°C to +60°C |
| Air humidity | <95% RH* | <95% RH* | <95% RH* |
| Air pressure | 86 to 106kPa | 86 to 106kPa | 86 to 106kPa |
| Storage | | | |
| Temperature | -20°C to +40°C | -20°C to +50°C | -20°C to +50°C |
| Air humidity | 25 to 75% RH | 25 to 75% RH | 25 to 75% RH |
| Air pressure | 86 to 106kPa | 86 to 106kPa | 86 to 106kPa |
| Transport (during a maximum of 24 hours) | | | |
| Temperature | -35°C to +50°C | -35°C to +85°C | -35°C to +85°C |
| Air humidity | <95% RH* | <95% RH* | <95% RH* |
| Air pressure | 86 to 106kPa | 86 to 106kPa | 86 to 106kPa |

* = no condensation.

= The hardware is supposed to operate up to +60°C .

The system parts must have been developed according to IEC 60721-3-1 and IEC 60721-3-2 and must have been tested according to IEC 60721-4-1 and IEC 60721-4-2, in order to be able to be stored and transported without changing its properties or lifetime.

The system consists of products which must meet public law regulations including:

- the Low Voltage Directive (LVD: 2006/95/EG)
- the Radio & Telecommunication Terminal Equipment Directive (R&TTE: 1999/5/EG)
- the Electromagnetic Compatibility Directive (EMC: 89/336/EEG > 2004/108/EG)
- the Construction Products Directive (CPD: 89/106/EG)

The products in the system are evaluated according to Evaluation Guideline BRL-K21014. The Evaluation Guideline incorporates parts the following standards. The exact relation between the guideline and the standards is reflected in the annexes of the Evaluation Guideline.

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Relevant standards are;

| Standard number | Standard title | Year |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| BRL-K23001/03 | Autonomous stationary extinguishing systems based on dry aerosols | 2005 |
| UL 2775 | Outline of investigation for fixed condensed aerosol extinguishing units issue no. 1. | 2008 |
| CEN/TR 15276-1 | Fixed fire fighting systems - Condensed aerosol extinguishing systems - Part 1: requirements and test methods for components | 2008 |
| ISO 2859-1 | Sampling procedures for sampling attributes – part 1: sampling schemes indexed by expectance quality limit (AQL) for lot by lot inspection | 1999 |
| NEN 3011 | Safety colors and safety signs | 1986 |
| NEN 5509 | User manuals – Content, structure, formulation and presentation | 1998 |
| CEI/IEC 62079 | Preparation of instructions structure ring, content and presentation | 2001 |
| IEC 60529 | Consolidated Edition Degrees of protection provided by enclosures (IP Code) Applies to the classification of degrees of protection provided by enclosures for electrical equipment with a rated voltage not exceeding 72,5 kV. Has the status of a basic safety publication in accordance with IEC Guide 104 | 2001 |
| NEN - EN 54-2 | Fire detection and fire alarm systems - Part 2: Control and indicating equipment (including correction document) | 1999 |
| NEN - EN 54-4 | Fire detection and fire alarm systems - Part 4: Power supply equipment (including correction document) | 2002 |
| NEN - EN 54-5 | Fire detection and fire alarm systems - Part 5: Thermal alarm devices - Point detectors | 2001 |
| PrNEN - EN 54-13 | Fire detection and fire alarm systems - Part 13: Compatibility of system components | 2001 |
| PrNEN - EN 54-18 | Fire detection and fire alarm systems - Part 18: Input/output devices | 2003 |
| PrNEN - EN 54-21 | Fire detection and fire alarm systems - Part 21: Alarm transmission and fault warning routing equipment | 2004 |
| NEN - EN 54-25 | Fire detection and fire alarm systems - Part 25: Components using radio links and system requirements | 2008 |
| NEN – EN 12094-1 | Fixed fire-fighting systems - Components for gas extinguishing systems - Part 1: Requirements and test methods for electrical automatic control and delay devices | 2003 |
| IEC 60068-1-1 | Basic Environmental testing procedures – 1998 Part 1: general and guidance | 1998+A1: 1992 |
| IEC 60068-2-1 | Environmental testing – Part 2-1: Tests – Tests A: Cold (inclusive correction document) | 1990 |
| IEC 60068-2-2 | Basic environmental testing procedures – Part 2-2: Tests – Tests B: Dry Heat d (inclusive correction document) | 1974 |
| IEC 60068-2-6 | Environmental testing – Part 2-6: Tests – Tests A:Fc: Vibration (sinusoidal), (inclusive correction document) | 1996 |
| IEC 60068-2-27 | Environmental testing – Part 2-27: Tests – Tests Ea: Shock | 1987 |
| IEC 60068-2-30 | Environmental testing – Part 2-30: Tests – Tests Db and guidance Damp heat cyclic | 1980 |
| IEC 60068-2-32 | Environmental testing – Part 2-32: Tests – Tests Ed: Free Fall | 1993 |
| IEC 60068-2-42 | Environmental testing – Part 2-42: Test methods – Tests Kc: Sulphur dioxide test for contacts and connections | 2002 |
| IEC 60068-2-75 | Environmental testing – Part 2-75: Tests – Tests Eh: Hammer Test | 1997 |
| IEC 60068-2-78 | Environmental testing – Part 2-78: Tests – Tests Cab: Damp Heat, steady state | 2001 |
| IEC 61340-5-2 | Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide | 2001 |
| EN 2 | Fire classes | 1994 |

MARKING

The products shall be marked with the following label.



NL - K21014

NOFIQ Fire Detection and Extinguishing System

Place of the mark:

The packaging must be appropriate for its use, which is at least: transport with a container for road, ship and air freight. Furthermore packaging must reckon with transport of aerosol components.

The packaging must contain stickers that offer a safety instruction for the system's use. The stickers must be attached to the outside and inside of the object to be protected and should read: "AUTOMATIC FIRE-EXTINGUISHING SYSTEM, in case of fire or alarm, do not panic, close door(s) and alert expert assistance".

If special measures are necessary for preservation, those must be stated in the working instructions and on the identification label of the packaging. The identification on the housing and/or packaging must clearly state the following issues:

Compulsory indications:

| Housing | Packaging | Indication |
|---------|-----------|---------------------------------------------------------------|
| X | | Qualification on the FEC based on EN2 |
| X | X | Name certified supplier |
| | X | Address and telephone number certified supplier |
| X | X | Model / type number |
| | X | Number of pieces |
| X | X | Building year / date of production |
| X | | CE + number institution in question |
| X | X | Land of production |
| | X | Compulsory information based on R&TTE, EMC and LVD directives |

The certified products must be provided with the label, stating "BRL-K21014".

Manual

The product is exclusively supplied to customers who are qualified by the supplier. In this qualification, it must be settled that the customer has received and understood the installation and user manual. The manual for design, installation, acceptance, use and maintenance must meet the requirements stated in NEN 5509: 1998 and CEI-IEC 62079: 2001.

Furthermore, the manual must offer compulsory information based on the R&TTE, EMC and LVD directives.

Method of marking:

- Non-erasable;
- Clear and according to the certification scheme

RECOMMENDATIONS FOR CUSTOMERS:

1. Check at the time of delivery whether:
 - 1.1 the producer has delivery in accordance with the agreement;
 - 1.2 the mark and the marking method are correct;
 - 1.3 the products show no visible defects as a result of transport etc.
2. If you should reject a product on the basis of the above, please contact:
 - 2.1 NOFIQ Fire & Safety Systems B.V.
and, if necessary,
 - 2.2 Kiwa Nederland B.V.
3. Consult the producer's processing guidelines for the proper storage and transport methods.
4. Check whether this certificate is still valid by consulting www.1kiwa.com

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ADDITIONAL APPROVAL / CERTIFICATION / LISTING OF THE PRODUCT

The NOFIQ Fire-extinguishing system has the following additional approval /certification / listing;

- Grant of Equipment Authorization. Certification Issued Under the Authority of the Federal Communications Commission Grantee Code W6O-102020A, N20-Base_Hub; date 4 April 2009.
- Grant of Equipment Authorization. Certification Issued Under the Authority of the Federal Communications Commission Grantee Code W6O-102030A, N20-HUB; date 7 April 2009.
- Grant of Equipment Authorization. Certification Issued Under the Authority of the Federal Communications Commission Grantee Code W6O-102040A, ZigBee Fire Control and Indicating Apparatus; date 7 April 2009.

INTERGRATED APPROVAL / CERTIFICATION / LISTING OF THE PRODUCT

- LETTER OF OPINION; Issued by TÜV Rheinland EPS B.V. Date: January 4, 2008, Reference number 0707050101 based R&TTE DIRECTIVE.
 - LVD TCF CERTIFICATE; Issued by TÜV Rheinland EPS B.V. Date: January 04, 2008; Certificate number 0707050103.
 - STATEMENT OF COMPLIANCE; Issued by TÜV Rheinland EPS B.V. Date : January 04, 2008; Certificate number 0707050102
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