



# **Additional Requirements**

## **Requirements and Test Methods**

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## VdS Guidelines for Smoke Alarm Devices

# Additional Requirements

## Requirements and Test Methods

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# 1 General

Tests according to these guidelines shall only be carried out by a testing authority accredited in accordance with DIN EN ISO/IEC 17025.

Apart from the fulfilment of the following requirements, these guidelines require regular market surveillance.

## 1.1 Scope

These guidelines specify requirements, test procedures and performance characteristics for smoke alarm devices to be used in residential areas inside buildings which apply in addition to those of European standard EN 14604 harmonised in accordance with the Construction Products Law of the European Union. They are binding only if their application is agreed in each individual case. Otherwise, these guidelines are non-binding; any agreement to apply these guidelines is strictly optional.

## 1.2 Validity

These guidelines become valid as from their publication.

# 2 Normative references

These guidelines incorporate dated and undated references to other publications (e.g. European standards EN) which are listed hereafter.

For dated references to other publications, subsequent amendments to or revisions of any of these publications apply only when incorporated by amendment of these guidelines. For undated references the latest edition of the publication referred to applies.

- **DIN 14676** Smoke alarm devices for use in residential buildings, apartments and rooms with similar purposes – Installation, use and maintenance, 2006-08
- **DIN EN 54-7** Fire detection and fire alarm systems – Part 7: Smoke detectors – Point detectors using scattered light, transmitted light or ionisation, 2006-09
- **DIN EN 14604** Smoke alarm devices, 2009-02
- **DIN EN 50130-4** Alarm systems; Part 4: Electromagnetic compatibility; Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
- **VdS 3515** Guidelines for smoke alarms using radio links, 2005-05
- **IPC-A-610D DE, 2005 : 02** Acceptability of electronic assemblies

# 3 Definitions

For the use of these guidelines the definitions of DIN EN 14604 : 2009 and DIN EN 54-7 : 2006 apply.

## 4 Requirements

For compliance with these guidelines the smoke alarm devices shall fulfil the following:

- the relevant requirements of product standard DIN EN 14604 : 2009-02 and
- the requirements of these guidelines.

### 4.1 General

The general testing and connecting conditions in accordance with DIN EN 14604 Cl. 5.1.1 to 5.1.6 apply. The test schedule specified in DIN EN 14604 Cl. 5.1.7 shall be applied in all relevant issues.

The applicant submits at least 20 specimens. These specimens shall be representative for the production in this place of manufacture as regards design and calibration.

The applicant also submits the following:

- documentation as required in Standard IPC-A-610D DE, 2005 : 02, and
- manufacturer's declaration that the production is in accordance with Standard IPC-A-610D DE, 2005 : 02, Class 2. Appropriate documents such as quality plan, working and testing instructions, etc. shall be submitted.

### 4.2 Requirements and test methods

#### 4.2.1 Battery service life

##### 4.2.1.1 Requirements

The battery service life shall be at least 10 years. The batteries shall be fixed and not easily replaceable.

##### 4.2.1.2 Test method

The verification of the manufacturer's specifications corresponds to the procedure specified in DIN EN 14604 Cl. 4.15, but for an increased period of time in accordance with the battery service life specified by the manufacturer, however at least for a battery service life of 10 years.

#### 4.2.2 Undercutting of supply voltage at which a battery fault warning is given

##### 4.2.2.1 Requirements

An undercutting of the threshold for battery fault warnings shall not cause an alarm signal.

##### 4.2.2.2 Test method

Based on the voltage ( $V_E$ ) at which a fault warning is given (DIN EN 14604 Cl. 5.16) the supply voltage  $V$  is reduced in increments of 0,1 V per minute down to supply voltage 0 V.

### **4.2.3 Protection against the ingress of foreign bodies**

#### **4.2.3.1 Requirements**

The smoke alarm device shall be designed such that a sphere of diameter  $(1,3 \pm 0,05)$  mm and a bar-shaped access probe with rectangular profile and edge length  $(1,0 \pm 0,05)$  mm x  $(2,0 \pm 0,05)$  mm cannot pass into the measuring chamber.

#### **4.2.3.1 Test method**

The required performance characteristics are checked theoretically on the basis of the documentation, visually and/or by testing the submitted smoke alarm devices.

### **4.2.4 Damp heat, steady state (endurance 21 days)**

#### **4.2.4.1 Requirement**

The relation of the response threshold values  $m_{max} : m_{min}$  shall not exceed 1,6. Operation of the routine test facility (DIN EN Cl. 4.10) shall activate the sounder.

#### **4.2.4.2 Test method**

The test method corresponds to DIN EN 14604 Cl. 5.9, but with increased severity regarding the duration (21 days). In addition, after the climatic conditioning and a recovery period of at least one hour the routine test facility (test button) shall be activated.

### **4.2.5 Sulphur dioxide – (SO<sub>2</sub>) corrosion (endurance 21 days)**

#### **4.2.5.1 Requirement**

The relation of the response threshold values  $m_{max} : m_{min}$  shall not exceed 1,6. Operation of the routine test facility (DIN EN Cl. 4.10) shall activate the sounder.

#### **4.2.5.2 Test method**

The test method corresponds to DIN EN 14604 Cl. 5.10, but with increased severity regarding the duration (21 days). In addition, after the corrosion conditioning and a recovery period of at least one hour the routine test facility (test button) shall be activated.

### **4.2.6 Shock (operational)**

#### **4.2.6.1 Requirement**

The relation of the response threshold values measured before and after the conditioning  $m_{max} : m_{min}$  shall not exceed 1,6. Operation of the routine test facility (DIN EN 14604 Cl. 4.10) shall activate the sounder.

#### **4.2.6.2 Test method**

The test method corresponds to DIN EN 54-7 Cl. 5.13. In addition, after the mechanical conditioning the routine test facility (test button) shall be activated.

*Note: The tests "Shock" and "Vibration" may be combined. In this case, the response threshold value is measured after these two tests in accordance with the procedure specified in DIN 14604 Cl. 5.12.*

## **4.2.7 Electromagnetic compatibility (EMC), Immunity tests, Radiated electromagnetic fields**

### **4.2.7.1 Requirement**

The relation of the response threshold values  $m_{max} : m_{min}$  shall not exceed 1,6.

### **4.2.7.2 Test method**

The test method corresponds to DIN EN 14604 Cl. 5.14 c) "Radiated electromagnetic fields (operational)", however, in the test according to Cl. 5.14 c) "Radiated electromagnetic fields" the field strength in the range (890-960) MHz is increased to 30 V/m. The increment of the cycle is 3 MHz.

## **4.2.8 Temperature cycle test**

### **4.2.8.1 Requirement**

During the conditioning the specimen shall not give an alarm signal.

The relation of the response threshold values measured before and after the conditioning  $m_{max} : m_{min}$  shall not exceed 1,6.

### **4.2.8.2 Test method**

The specimen is stabilised at  $(25 \pm 2)$  °C and the following temperature cycle is applied 10 times:

- a) raise the temperature to  $(65 \pm 2)$  °C in  $(2 \pm 0,5)$  h;
- b) hold the temperature at  $(65 \pm 2)$  °C until 8,5 h after the beginning of the cycle;
- c) reduce the temperature to  $(-10 \pm 2)$  °C in  $(4 \pm 1)$  h;
- d) hold the temperature at  $(-10 \pm 2)$  °C until 19,5 h after the beginning of the cycle;
- e) raise the temperature to  $(25 \pm 2)$  °C in  $(2 \pm 0,5)$  h;
- f) hold the temperature at  $(25 \pm 2)$  °C until 24 h after the beginning of the cycle.

After this temperature cycle conditioning has been applied, the response threshold value of the smoke alarm device shall be measured in accordance with EN 14604 Cl. 5.1.5.