Water Flow Detectors

Requirements and Test Methods

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VdS Guidelines for Water Extinguishing Systems

Water Flow Detectors

Requirements and Test Methods

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To avoid any distraction from the understanding of the text, VdS uses the generic masculine throughout. There is expressly no preference or other valuation implied of the male, female or other genders.

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1 General information

1.1 Scope of application

These guidelines specify requirements and test methods for water flow detectors for use in water extinguishing systems in accordance with VdS CEA 4001 and VdS 2108.

Note 1: Water flow detectors and alarm water flow detectors are used to divide alarm areas of sprinkler systems (area connected to an alarm valve) into alarm sections, e.g. to be able to localise the alarm triggering more precisely in multi-storey buildings.

Note 2: Water flow detectors and alarm water flow detectors can be designed for installation in horizontal and vertical pipework or for one of the two installation positions.

Note 3: Alarm water flow detectors are used to transmit an alarm signal when extinguishing water flows (in accordance with VdS CEA 4001:2024-01 section 14.2.1).

Water flow detectors in accordance with these guidelines are only suitable for use in wet groups.

1.2 Validity

These guidelines apply from 01.06.2024. They replace the corresponding regulations in VdS 2100 Guidelines for Water Extinguishing Systems (1988-05) and VdS 2100-05 : 1981-01.

For products that were tested and approved according to the previous version of these guidelines, a transitional period of 4 years applies from the start of the validity of these guidelines. During this transitional period, the previous version of these guidelines can be used as a basis for extending product approval. .

Note: This is a translation of the German guidelines. If there are any discrepancies, the German version shall be binding.

2 Normative references

These guidelines contain dated and undated references to other regulations. The references are made in the relevant sections and the titles are listed below. Amendments or additions to dated regulations only apply if they are published by amending these guidelines. The latest version of undated regulations applies.

EN 12259-5 Fixed firefighting systems – Components for sprinkler and water spray systems – Part 5: Water flow detectors

EN 60335-1 Household and similar electrical appliances – Safety – Part 1: General requirements

EN IEC 61020-6 Electromechanical switches for use in electronic equipment; Part 6: Frame specification for snap-action switches

EN IEC 61058-1 Appliance switches – Part 1: General requirements

EN ISO 9227 Corrosion tests in artificial atmospheres – Salt spray tests

ISO 898-1 Mechanical properties of fasteners made of carbon steel and alloy steel – Part 1: Bolts with specified property classes – Standard thread and fine pitch thread

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ISO 898-2 Mechanical properties of fasteners made of carbon steel and alloy steel – Part 2: Nuts with specified property classes – Standard thread and fine pitch thread

VdS 2108 Richtlinien für Schaumlöschanlagen – Planung und Einbau (Guidelines for foam extinguishing systems – Planning and installation)

VdS 2344 Verfahren für die Prüfung, Anerkennung und Zertifizierung von Produkten und Systemen der Brandschutz- und Sicherungstechnik (Procedure for the testing, approval and certification of fire protection and security technology products and systems)

VdS CEA 4001 Richtlinien für Sprinkleranlagen – Planung und Einbau (Guidelines for sprinkler systems – Planning and installation)

3 Terms

For the application of these guidelines, the definitions according to DIN EN 12259-5 and the following apply:

Trigger point: Minimum flow rate that must prevail downstream of the flow detector in the direction of flow for it to respond and emit a signal

Alarm water flow detector: used to transmit an alarm signal when extinguishing water flows

Maximum allowable pressure: pressure specified by the client for which the test is to be carried out; the test pressures are calculated based on this value

Test module: shows the test sequence

Test sample: a component that is subjected to tests in a specific sequence

Water Flow detectors: are used to divide alarm areas of sprinkler systems (area connected to an alarm valve) into alarm sections, e.g. to be able to localise the alarm triggering more precisely in multi-storey buildings

4 Classification

Within these guidelines, a distinction is made between alarm water flow detectors and water flow detectors.

Unless alarm water flow detectors are explicitly mentioned in this document, the term "water flow detector" refers to all components corresponding to the scope of application.

5 Requirements

5.1 General information

5.1.1 Test conditions

The test conditions as specified under clause 6.1.1 shall be kept unless otherwise indicated.

5.1.2 Test modules and test samples

The test samples shall pass the respective test modules according to section 6.1.2.

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5.2 Technical documentation

5.2.1 General information

The following documents are required:

a) Production documents:
   - assembly drawings
   - drawings of all individual parts
   - material specifications
   - manufacturer's certificate for any integrated microswitches
   - manufacturer's certificate for electrical connections and earthing connections

Marking in accordance with section 5.2.2 shall be documented in the drawings. If this marking is coded, the meaning of the codes shall be documented in the drawings.

b) Installation and operating instructions for the use of water flow detectors in stationary water extinguishing systems, in which all information relevant to the user is summarised and which contains at least the following information:
   - model/type of water flow detector
   - available sizes of the water flow detector
   - max. allowable pressure
   - flow trigger point and permissible deviation
   - pipe diameter and wall thickness of the connecting pipes
   - pipe diameter and wall thickness
   - nut torques of the fastening elements
   - setting instructions
   - electrical characteristics (including rated voltage and current)
   - intended installation position(s) / admissible installation position
   - procedure for sealing the cable entry

c) Document list (with its own designation, drawing number, revision status, date) containing all the documents required above (each with its designation, drawing number, revision status and date)

5.2.2 Marking

Water flow detectors shall be marked with the following information:

- name or identification of the client/supplier
- type designation
- nominal diameter
- maximum allowable pressure
- outer pipe diameter of the connecting pipe
- year of manufacture / Code
- trigger point
- flow direction

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– electrical rated values (current, voltage)
– marking in accordance with VdS 2344 as VdS-approved

This marking shall be non-detachable captive, non-flammable, permanent and clearly legible in the installation position. Markings using adhesive films or similar is not permitted.

The direction of flow shall be recognisable even without a cover.

A circuit diagram shall be attached inside the housing, which also contains the connection conditions.

5.2.3 Corrosion and ageing resistance

Corrosion and ageing shall not have a detrimental effect on the performance characteristics of the water flow detectors.

VdS reserves the right to carry out additional tests after informing the client in advance.

5.2.4 Design

5.2.4.1 Design requirements

The client shall specify the permissible pressure, which shall be at least 12 bar.

Note: See also notes 1 and 2 under section 1.1.

Water flow detectors shall be designed in such a way that they can be installed in the pipework without any modifications. If the water flow detector is removed from the pipework, no flow obstructions shall remain in the pipe.

More over, the water flow detectors shall comply with the specifications of VdS CEA 4001 with regard to the outer tube diameter and wall thickness.

The intended position of the paddle in the pipe shall be designed in such a way that the previous position is exactly and inevitably restored when the paddle is removed and reinstalled. Twisting or similar shall be ruled out by the design.

Installation using e.g. threaded fittings, threaded sockets or tapping clamps with threads for fastening is not permitted. This does not apply to factory-fitted components.

The minimum pipe wall thickness of the connecting pipe shall meet the requirements of VdS CEA 4001:2021-01 (07) section 15.1.2.

To ensure proper function even in the event of corrosion and deposits, there shall be sufficient clearance between all moving and fixed parts. This applies both to the water flow detector itself and to the interaction between the water flow detector and the inside of the pipe.

It shall be possible for water to flow back through water flow detectors, e.g. when draining the pipework.

It shall be ensured that a cross-section of at least 60 % of the nominal cross-section is released when water flows through the water flow detector, including backflow. In addition to reviewing the technical documentation, the pressure loss test in accordance with section 5.4.7 is taken into account during the test.

Rigid parts projecting into the main water flow are not permitted.

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5.2.4.2 Maintenance and service

Maintenance of individual components of the water flow detector is not permitted, with the exception of cleaning the paddle. The water flow detector shall only be replaced completely.

It shall be possible to carry out maintenance and cleaning work without special tools.

5.2.4.3 Electrical components

The integrated microswitches shall comply with the provisions of DIN EN IEC 61020-6 or DIN EN IEC 61058-1.

Electrical connections and earthing connections shall comply with the provisions of DIN EN 60335-1.

The water flow detector shall be set up for the electrical transmission of the alarm.

For the electrical part, the corresponding regulations for hazard alarm systems of VDE (the association of German Electrical Engineers) apply. The protection class of the water flow detector shall be at least IP 54.

The water flow detectors shall be equipped with connection means that allow the cables or any resistors to be securely connected for monitoring for wire breakage and short circuits. Cable bushings shall be located on the underside of the device or on the side so that they are orientated downwards or sideways in the normal installation position.

If the electrical connection is made via a detachable device plug connection on the outside of the housing, it shall be possible to mechanically secure the plug on the base and the plug connection shall be designed to at least IP 54.

5.2.4.4 Materials

Water flow detectors shall fulfil the requirements of DIN EN 12259-5 with regard to the choice of materials.

Pressurised components

Pressurised components shall be made of metallic materials. Aluminium alloys and cast iron materials are permitted.

Components that come into contact with water and are subject to mechanical stress (e.g. levers) or rotational or thrust movements shall be made of bronze, brass, copper alloys, stainless steel or materials with equivalent physical and mechanical properties. The paddle of the water flow detector is an exception to this rule.

Other components that come into contact with water shall be made of corrosion-resistant metals.

Aluminium alloys or cast iron components with untreated surfaces must not come into contact with water. This is permissible if the surface has been treated to prevent corrosion.

Fasteners

At four times the nominal working pressure, the calculated load on the fastener shall not exceed the minimum tensile strength according to ISO 898-1 and ISO 898-2.

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When using flat gaskets, the calculated area is determined by the mounting opening of the pipe. For O-rings/sealing rings, the calculated area is determined by the average diameter of the O-ring/sealing ring.

5.2.4.5 Sealing elements

Proof of compliance with the requirements in accordance with DIN EN 12259-5:2002:12 Section 4.4.9 shall be provided by the client.

5.3 Compliance

The test samples shall be accompanied by the technical documentation in accordance with section 5.2 and comply with the scope of these guidelines.

5.4 Performance characteristics

5.4.1 Connections

The client shall specify all connections of the water flow detector. The test is carried out in accordance with section 6.4.1.

5.4.2 Operation

5.4.2.1 Sensitivity

Water flow detectors shall fulfil the requirements of DIN EN 12259-5 with regard to their function.

During the test in accordance with section 6.4.2.1 the water flow detector shall not emit a signal at a flow rate < 10 l/min. If a flow rate > 80 l/min is reached, the water flow detector shall emit a continuous signal. This applies to all installation positions defined by the manufacturer.

Note: The specification of a lower trigger point than 80 l/min, at which a continuous signal is emitted, is permissible.

A reduction of the flow rate to < 10 l/min shall result in an automatic reset of the water flow detector including the delay assembly to the standby state.

To prevent false alarms caused by a brief flow of water, a delay device shall be provided, which shall be adjustable from 0 to 30 seconds. The delay device can be part of the water flow detector or can also be located in a separate housing (e.g. fire alarm control panel). If the water flow is interrupted or reduced below 10 l/min and the water flow is restored above the trigger point, the full delay time shall become effective again.

The water flow detector shall be able to issue successive signals manually without resetting. It shall be possible to test the function of the water flow detector when it is installed.

5.4.2.2 Operation reliability

During the test in accordance with section 6.4.2.2 the water flow detector shall function properly for 10,000 cycles in normal operation. Subsequently, the function of the water flow detector shall fulfil the requirements in accordance with section 5.4.2.1 only with supply pressure of 1 bar.

During the test in accordance with section 6.4.2.2 the test specimen is also tested for compliance with the requirements in accordance with section 5.4.2.3.

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Components such as springs or membranes shall not show any signs of cracks or breakage.

5.4.2.3 Electrical components

During the test in accordance with section 6.4.2.3 the contact and insulation resistances shall correspond to the data specified by the client.

5.4.2.4 Temperature resistance

After a temperature exposure of 2 °C and 68 °C in accordance with the test in section 6.4.2.4 the water flow detector shall operate as intended. During a subsequent functional check, the water flow detector is checked for compliance with the requirements in accordance with section 5.4.2.1. No signs of crack, breakage or unacceptable wear are allowed by the following visual inspection of the paddle .

5.4.3 Pressure strength

When testing the strength of the pressure-bearing parts in accordance with section 6.4.3 no signs of leakage, unacceptable plastic deformation or breakage shall be recognisable on the test specimen. O-rings shall generally not swell out.

5.4.4 Tightness

During the test in accordance with section 6.4.4 no signs of leak or impermissible plastic deformation shall be recognisable on the water flow detector.

5.4.5 Water hammer

During the test in accordance with section 6.4.5 there shall be no signs of crack, breakage or inadmissible plastic deformation. O-rings shall generally not swell out.

5.4.6 Leak test with pressure air

During the test in accordance with section 6.4.6 no signs of leak or impermissible plastic deformation shall be recognisable on the water flow detector.

5.4.7 Pressure loss

The pressure loss in the water flow detector shall not exceed 0.2 bar at a flow velocity of 5 m/s related to the nominal cross-section.

5.4.8 Flow

The flow detector shall be suitable for flow velocities up to at least 10 m/s related to the nominal diameter of the pipe.

The flow test in accordance with section 6.4.8 is intended to ensure that the water flow detector does not pose a risk to the function of the sprinkler system (e.g. due to components of the water flow detector becoming loose). After the test, the water flow detector shall not have any signs of crack, breakage, impermissible plastic deformation or operation-impairing damages.

5.4.9 Flow obstructions (8 mm)

The water flow detector shall be tested in accordance with section 6.4.9 when a rod (diameter 8 mm) is fixed along the pipe inside the pipe wall.

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5.4.10 Dimension and wear

After carrying out the tests in accordance with sections 6.4.2 to 6.4.9 the test samples according to section 6.4.10 shall show no dimensional deviations and no signs of impermissible wear, impermissible plastic deformation or operation-impairing damage.

5.5 Environmental requirements

5.5.1 Salt spray corrosion

After the test according to section 6.5.1 no signs of function-impairing corrosion shall be recognisable. The test specimen is then tested for compliance with the response sensitivity requirements, only with supply pressure of 1 bar in accordance with section 5.4.2.1 and the contact and insulation resistances in accordance with section 5.4.2.3 are checked.

5.5.2 Stress corrosion test

Pressurised and functionally relevant components made of copper or its alloys shall be subjected to a stress corrosion cracking test with ammonia.

When testing in accordance with section 6.5.2 no signs of intergranular corrosion shall be observed.

5.5.3 Ageing resistance of non-metallic materials

5.5.3.1 Ageing in warm air

During the test in accordance with section 6.5.3.1 no signs of operation-impairing corrosion, cracks, fractures, impermissible plastic deformation or material flow shall be recognisable. This does not apply to seals and sealing rings. The water flow detector is then checked for compliance with the requirements for function and tightness in accordance with section 5.4.2 and 5.4.4.

Note: This test is carried out on components that are in contact with air during operation / standby mode.

5.5.3.2 Ageing in warm water

During the test in accordance with section 6.5.3.2 no signs of operation-impairing corrosion, cracks, fractures, impermissible plastic deformation or material flow shall be recognisable. This does not apply to seals and sealing rings. The water flow detector is then checked for compliance with the requirements for function and tightness in accordance with section 5.4.2 and 5.4.4.

Note: This test is carried out on components that are in contact with water during operation/standby mode.

5.5.4 Vibration, sinusoidal (optional, only for alarm water flow detectors)

Water flow detectors shall be able to withstand the effect of sinusoidal vibrations in accordance with section 6.5.4. They must not be damaged in the process. After stressing, the water flow detector shall operate as intended and fulfil the requirements for response sensitivity in accordance with section 5.4.2.1.

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6 Tests

6.1 General information

6.1.1 Test conditions

The tests are carried out at a temperature of (25 ± 10) °C, unless otherwise specified for a particular test.

The tolerance for all test parameters is ± 5%, unless otherwise specified.

6.1.2 Test modules and test samples

For the testing of water flow detectors, the number of test samples required is determined when the test plan is drawn up. The client then receives the test plan and the designation of the required test samples.

The tests are carried out in the order as shown in Table 6-1 to Table 6-6.

Examinations	**Reference**	**2 test samples per nominal width**	
		Test sample 1	**Test sample 2**
Technical documentation	5.2 / 6.2	X	
Conformity	5.3 / 6.3	X	
Connections	5.4.1 / 6.4.1	X	
Design	5.2.4 / 6.2.4	X	
Flow obstructions (8 mm)	5.4.9 / 6.4.9	X	
Sensitivity [1)]	5.4.2.1 / 6.4.2.1	X	
Compressive strength	5.4.3 / 6.4.3	X	
Operation reliability	5.4.2.2/ 6.4.2.2	X	
Sensitivity [2)]	5.4.2.1 / 6.4.2.1	X	
Compressive strength	5.4.3 / 6.4.3	X	
Electrical components [3)]	5.4.2.3 / 6.4.2.3		X
Pressure loss	5.4.7 / 6.4.7	X	
Tightness	5.4.4 / 6.4.4	X	
Flow	5.4.8 / 6.4.8	X	

[1)] Testing the sensitivity in each intended mounting position

[2)] Sensitivity test as a control test after the functional security test

[3)] Testing the electrical components includes testing the contact and insulation resistance

Table 6-1: Test module 1

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Examinations	**Reference**	**4 test samples per nominal width per variant**
Ageing in warm air	5.5.3.1 / 6.5.3.1	X
Operation	5.4.2 / 6.4.2	X
Tightness	5.4.4 / 6.4.4	X
Ageing in warm water	5.5.3.2 / 6.5.3.2	X
Operation	5.4.2 / 6.4.2	X
Tightness	5.4.4 / 6.4.4	X

Table 6-2: Test module 2

Examinations	**Reference**	**1 test sample of medium nominal size**
Temperature resistance	5.4.2.4 / 6.4.2.4	X
Pressure strength	5.4.3 / 6.4.3	X
Sensitivity [1)]	5.4.2.1 / 6.4.2.1	X
Following by visual check / visual inspection		
[1)] Testing the sensitivity in each intended mounting position		

Table 6-3: Test module 3

Examinations	**Reference**	**1 test sample of medium nominal size**
Salt spray	5.5.1 / 6.5.1	X
Pressure strength	5.4.3 / 6.4.3	X
Sensitivity [1)]	5.4.2.1 / 6.4.2.1	X
Electrical components [3)]	5.4.2.3 / 6.4.2.3	X
[1)] Testing the sensitivity in each intended mounting position [3)] Testing the electrical components includes testing the contact and insulation resistance		

Table 6-4: Test module 4

Examinations	**Reference**	**3 test samples (smallest, medium and largest nominal size)**
Pressure strength	5.4.3 / 6.4.3	X
Water hammer	5.4.5 / 6.4.5	X
Leak test with pressure air	5.4.6 / 6.4.6	X
Note: These tests relate exclusively to the mechanical strength of the pressure-bearing parts, no follow-up testing is planned		

Table 6-5: Test module 5

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Examinations	Reference	1 test sample of each type
Stress corrosion test	5.5.2 / 6.5.2	X
Note: The test is only carried out on parts / components made of copper or copper alloys		

Table 6-6: Test module 6

After carrying out the tests according to Table 6-1 to Table 6-6 a dimensional and wear check is carried out in accordance with section 5.4.10.

6.2 Technical documentation

6.2.1 General information

The technical documentation submitted by the client is reviewed and checked for the requirements in accordance with section 5.2.1.

6.2.2 Marking

The marking is evaluated by visual inspection and checked for completeness and compliance with the requirements in accordance with section 5.2.2.

6.2.3 Resistance to ageing and corrosion

By reviewing the documentation and, if necessary, assessing the test specimens, it is determined whether the requirements according to section 5.2.3 are met or whether further corrosion and ageing resistance tests are necessary.

6.2.4 Design requirements

By reviewing the documentation and, if necessary, assessing the test specimens, it is determined whether the requirements according to section 5.2.4 are complied with.

6.3 Check for compliance

A visual and dimensional inspection is carried out to check whether the test samples correspond to the description in the technical documentation and meet the verifiable requirements of these guidelines.

6.4 Performance characteristics

6.4.1 Connections

The connections of the water flow detector are measured and checked for compliance with the requirements in accordance with section 5.4.1.

6.4.2 Operation test

6.4.2.1 Sensitivity

The sensitivity test is carried out in accordance with section F.1 of DIN EN 12259- 5:2002-12. The test specimen is tested for compliance with the requirements according to section 5.4.2.1.

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6.4.2.2 Operation reliability test

The sensitivity test is carried out in accordance with section F.2 of DIN EN 122595-:2002-12. The test specimen is tested for compliance with the requirements according to section 5.4.2.2.

The test specimen is installed in a horizontal position in a water pipe with a flow meter. The water flow detector is actuated 10,000 times at a water rate of 100 l/min with maximum delay time. It is then checked 5 times to see whether the set switching point has changed inadmissibly.

It is then checked whether the deceleration device fulfils the requirements in section 5.2.4.

The requirements according to section 5.4.2.2 shall be complied with.

6.4.2.3 Testing of electrical components

The sensitivity test is carried out in accordance with sections F.2.1 and F.2.2 of DIN EN 122595-:2002-12. The test specimen is tested for compliance with the requirements in accordance with section 5.4.2.3.

The electrical part is checked for its performance in accordance with the information specified by the client.

The requirements according to section 5.4.2.3 shall be complied with.

6.4.2.4 Testing of temperature resistance

The sensitivity test is carried out in accordance with section F.3 of DIN EN 122595-:2002-12. The test specimen is tested for compliance with the requirements according to section 5.4.2.2.

6.4.3 Pressure strength test

The test sample is installed in the pipework as specified by the client. The pipe is then closed and the test setup is subjected to a water pressure corresponding to 4 times the nominal operating pressure for 10 minutes.

During or after completion of the test, the test specimen is checked for compliance with the requirements in accordance with section 5.4.3.

6.4.4 Leak test

The test sample is installed in the pipework as specified by the client. The pipe is then closed and the test setup is subjected to a water pressure corresponding to 2 times the nominal operating pressure or 25 bar, depending on which pressure is higher, for 5 minutes.

During or after completion of the test, the test specimen is checked for compliance with the requirements in accordance with section 5.4.4.

6.4.5 Water hammer test

The water flow detector is subjected to a water hammer test with the following parameters:

– Test medium: Water

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– Water hammer: 3.5 bar to (specified max. permissible pressure + 15 bar)
– Number of water hammers: 3.000

The test specimen is then checked for compliance with the requirements in section 5.4.5.

6.4.6 Leak test with pressure air

The test specimen is mounted in the pipework as specified by the client. The pipe is then sealed and the test setup is subjected to an air pressure of 10 bar for 10 minutes.

During or after completion of the test, the test specimen is checked for compliance with the requirements in accordance with section 5.4.6.

6.4.7 Testing of pressure loss

The pressure loss is measured on a steel pipe measuring section with a straight inlet of at least 10 times the nominal diameter and a straight outlet of at least 5 times the nominal diameter. The pressure loss is determined at a flow velocity of 5 m/s in relation to the nominal cross-section.

The determined value is used to calculate equivalent pipe lengths.

The requirements according to section 5.4.7 shall be complied with.

6.4.8 Flow test

The water flow detector is exposed to a flow with a velocity of 10 m/s for 90 minutes, based on the nominal diameter (DN).

The requirements according to section 5.4.8 shall be complied with.

6.4.9 Flow obstructions (8 mm)

The flow obstruction test is carried out in accordance with section E.2 of DIN EN 122595-:2002-12. The test specimen is tested for compliance with the requirements in accordance with section 5.4.9.

6.4.10 Dimensional and wear control

After carrying out the tests in accordance with sections 6.4.2 and 6.4.3 the test specimens are dismantled and a visual and dimensional inspection is carried out to check whether the test specimens fulfil the requirements according to 5.4.10.

6.5 Environmental tests

6.5.1 Salt spray corrosion testing

The neutral salt spray corrosion test (NSS test) is carried out in accordance with DIN EN ISO 9227:2017-07 with a test duration of $10_{0}^{+0,25}$ days.

Subsequently, the specimen will be tested for a period of $7_{0}^{+0,25}$ days and in accordance with the procedures described in section 5.1.1 and checked for compliance with the requirements in accordance with section 5.5.1.

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6.5.2 Stress corrosion test

The test specimens are degreased and then exposed for $(10_0^{+0,25})$ days in a humid ammonia-air atmosphere in a glass container with a volume of 10 to 30 litres, the lid of which is shaped to prevent condensation from dripping onto the component.

The aqueous ammonia solution has a specific weight of 0.94 kg/dm^3 . The test specimens are located approximately 40 mm above the liquid level. For every litre of volume in the container, 10 cm^3 of the solution is filled into the container. The atmosphere then consists of approximately 35 % ammonia, 5 % water vapour and 60 % air. The test is carried out at atmospheric pressure and a temperature of (34 ± 2) °C. A capillary tube is used to equalise the pressure with the environment.

After the test, the parts of the water flow detector that are made of copper or its alloys are cleaned and dried, subjected to a visual inspection and checked for compliance with the requirements in accordance with section 5.5.2.

6.5.3 Testing the ageing resistance of non-metallic materials

6.5.3.1 Ageing in warm air

The ageing test in warm air is carried out in accordance with section C.1 of DIN EN 122595-:2002-12. The test specimen is tested for compliance with the requirements in section 5.5.3.1.

6.5.3.2 Ageing in warm water

The ageing test in warm water is carried out in accordance with section C.2 of DIN EN 122595-:2002-12. The test specimen is tested for compliance with the requirements in section 5.5.3.2.

6.5.4 Vibration, sinusoidal (optional, only for alarm water flow detectors)

This test refers to the requirements from section 5.5.4, the test method shall comply with EN 6006826.

The test specimen is rigidly mounted with connected cables at its attachment points on an vibration table in such a way that one of the three axes is perpendicular to its usual attachment plane.

The test sample shall then be subjected to sinusoidal vibrations in a frequency range from 10 Hz to 150 Hz in three perpendicular axes. This frequency range is run through once per axis starting at 10 Hz with a tuning rate of one octave per 30 min. The acceleration amplitude shall be 0.2 g in the frequency range from 10 Hz to 50 Hz and 0.5 g in the frequency range from 50 Hz to 150 Hz.

After this test, the function of the test specimen is checked for compliance with the requirements in section 5.5.4.

7 Option

VdS reserves the right, if, for example, special designs or new manufacturing processes require it, to check additional requirements after informing the client in advance and to carry out corresponding tests.

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Annex A Changes to the guidelines compared to the previous version

- Various editorial changes/restructuring to new VdS guideline format
- Non-binding note and note on generic masculine included
- Section 1 - Restriction for water flow detector added
- Section 1.1 - formerly Chapter 1 Addition to the scope of application
- Section 2 - Section Normative References added
- Section 3 - Terms section supplemented
- Section 4 - Classification section added
- Section 5.1 - formerly Chapter 3.1 - adopted and supplemented
- Section 5.2.1 - Adjustments and additions made
- Section 5.2.2 - formerly Chapter 2.1 - updated
- Section 5.2.3 / 6.2.3 - formerly Chapter 3.2.2 - adopted and supplemented
- Section 5.2.4.1 - formerly Chapter 2.3 - adopted and supplemented
- Section 5.2.4.2 - new content added
- Section 5.2.4.3 - new content added
- Section 5.2.4.4 - new content added
- Section 5.3 / 6.3 - formerly chapter 3.2.1 adopted and supplemented
- Section 5.4.1 - new content added
- Section 5.4.2.1 - formerly 2.2 - extensively revised , e.g. drawing deleted
- Section 5.4.2.2 / 6.4.2.2 - formerly Chapter 3.3.3 - adapted to the state of the art
- Section 5.4.2.3 / 6.4.2.3 - formerly Chapter 3.3.2 - adapted to the state of the art
- Chapters 5.4.3 / 6.4.2 - formerly 3.3.1 - adapted to the state of the art
- Chapters 5.4.5 / 6.4.5 - formerly 3.3.1 - adapted to the state of the art
- Chapters 5.4.6 / 6.4.6 - formerly 3.3.1 - adapted to the state of the art
- Section 5.4.7 - formerly Chapter 2.3. paragraph 2 adopted
- Section 5.4.8 - formerly 2.3 paragraph 1 adopted and supplemented
- Section 5.4.9 - new content added
- Section 5.4.10 - new content added
- Section 5.5 - new content added
- Section 6.4.2.4 - new content added
- Section 6.4.4 - new content added
- Section 6.4.7 - formerly 3.3.4 adopted
- Section 6.4.8 - formerly 3.3.5 paragraph 1 adopted
- Section 6.4.9 new content added
- Section 6.4.10 new content added
- Section 6.5 new content added
- Section 7 - formerly 3.4 adopted and supplemented

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