Version
1 March 2025

English Translation of established Dutch version

Approval requirement 194

Tools for temporarily closing of gas pipes

creating trust *driving progress*

GASTEC

kiwa

Preface Kiwa

This, translated from Dutch, approval requirement (AR), is approved by the Board of Experts (BoE) GASTEC QA. in which relevant parties in the field of gas related products are represented. This Board of Experts supervises the certification activities and where necessary require the GASTEC QA approval requirement to be revised. All references to Board of Experts in this GASTEC QA approval requirement pertain to the above-mentioned Board of Experts.

This, translated from Dutch, AR will be used by Kiwa Nederland BV in conjunction with the GASTEC QA general requirements and the KIWA regulations for certification.

Kiwa has a method which is established in the certification procedure for the execution of:

- The investigation for provisioning and maintaining a GASTEC QA product certificate based on this AR.
- The periodic evaluations of the certified products for the purpose of maintaining a provided GASTEC QA product certificate based on this AR.

This AR, translated from Dutch, is used as supporting document. In case of doubt of interpretation of this AR, the Dutch version is leading.

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Contents

1 Introduction

1.1 General

This GASTEC QA approval requirement (AR) in combination with the GASTEC QA general requirements, is applied by Kiwa as the basis for the issuing and maintaining the GASTEC QA product certificate for tools for temporarily closing of gas pipes.

With this product certificate, the certificate holder can demonstrate to his or her customers that an expert independent organization monitors the production process of the certificate holder, the quality of the product and the related quality assurance.

Next to the requirements established in this AR and the general requirements, Kiwa has additional requirements in the sense of general procedural requirements for certification, as laid down in the internal certification procedures.

This GASTEC QA approval requirement replaces the version of November 2024.

List of changes:

- The approval requirement is fully textually reviewed.
- Some used terms have changed.
- The list of definitions has been updated.
- The requirement after repeated use, previously paragraph 4.3.4.4, has been removed, as of this, paragraphs 4.3.4.5 and 4.3.4.6 have changed numbering to 4.3.4.4 and 4.3.4.5.
- The evaluation matrix in chapter 7 has been adjusted.

The product requirements have not changed.

1.2 Scope

This approval requirement applies for tools for the temporarily closing of gas distribution pipes with natural gas with a nominal pressure of 100 mbar, included are the distribution pipes in which a temporarily or permanent pressure is of maximal 200 mbar.

The specific function recommendations for the application of equipment for temporarily closing of gas distribution pipes is described in NEN 7244 series and the safety instructions natural gas (VIAG) with the accompanying work instructions (VWI). Also, the instructions / user manual of the supplier shall be followed.

The below table shows an overview of the under this approval requirement included equipment's with their application and characteristics.

Interrupt gas pipes in the distribution net with a nominal operating pressure up to and including 100 mbar.	**Replacement of main valve in the distribution net with a nominal operating pressure up to and including 100 mbar.**
Equipment in combination with inflatable closing element.	Valve change sets using inflatable closing element.
Equipment using a mechanical closing element	Valve change sets using mechanical closing element

Table 1

1.3 Leak criterion - < 10% LEL in a working pit

As part of the national HyDelta research program, research has been carried out into the suitability of gas bladders as a temporary seal (in a working pit) in the distribution network of the regional grid operator. In this study (HyDelta 2 WP6B), tests were carried out to determine the maximum leakage rate (natural gas and hydrogen) at which the concentration in a working pit is less than 10% LEL.

Regarding natural gas, the measurements carried out show that at 0.15 m^3/h a concentration ≥ 10% LEL was achieved. In this situation less than 5% of the measurements the concentration was ≥the 10% LEL.

The leakage value is based on a working pit with the dimensions: a depth, length, and width of 1m, 1.7m and 1.2m respectively. The size of the working pit influences, among other things, the measured concentration.

The 10% LEL relates to the working pit. Considering the field of application, a pipeline can be fed from two sides. When a pipe is interrupted, the gas therefore flows from two directions (the outflow openings) into a working pit.

Where relevant, for the acceptance criteria in this AR its considered that there are 2 outflow openings.
The permitted leakage quantity is therefore set in this AR at 0.075 m^3/h natural gas. See also chapter 4.

2 Definitions

In this approval requirement, the following definitions are applicable:

Attachment: A component that is screwed into a blowhole saddle and in which the lance can be placed correctly above the gas pipe. This attachment is provided with a rubber cover that allows the gas-free drilling and setting of closing elements.

Bladder, gasbladder: Inflatable element for temporarily closing of gas pipes.

Bladder saddle: Special saddle for placing a connection and sealing element.

Board of Experts (BoE): The Board of Experts GASTEC QA.

Connection element: The part that provides the connection between the pipe to be sealed and the equipment with the sealing element. This part can form an integrated whole with the equipment for the temporary closing of gas pipes. Examples of a connection element are the connection by an adapter on the attachment, on a tap, on a pipe, etc.

Consumption period for consumables (including blowing and other closing devices): Term and conditions the manufacturer specifies regarding use and shelf life.

Sealing element: The part with which the pipe is sealed (the inflatable or mechanical sealing element).

Double bladder: Two inflatable sealing elements, with or without a protective cover, which are physically connected to each other and are considered to be a single sealing element (one double bladder that can be operated by one pressure gauge rod) but each of which has a separate pressure gauge for inflation and vacuum extraction.

Dynamic seals: These are seals designed to ensure leak-tightness in moving parts. Examples of this are stuffing boxes / seals / o-rings / fitting seats, etc. which are used with components which move relative to each other during use. This can be turning or sliding as is the case with cranes, slides, retracting lances, or bars etc.

Flow: Flow rate of gas per unit time.

Gauge rod: The part of the tool that is used to insert the sealing element into the pipe. An example of a pressure gauge rod is the sliding part in the lance that passes through the connection element to be inserted in order to insert the sealing element into the pipe. The pressure gauge rod also ensures that the inflatable sealing element can be inflated, and vacuum extracted.

Inflation pressure: The pressure prescribed by the manufacturer in the sealing element after placement.

Lance: Part that is connected to the insertion element and connected to the connection element, after which the insertion element can move up and down in the lance for the insertion and retraction of the closing element.

LEL: The lower explosion limit.

LFL: The lower flammability limit. Below the lower flammability limit (LFL), there is insufficient fuel present to sustain a combustion reaction.

Maximum operating pressure (MOP): Maximum pressure that a component is capable of withstanding continuously in service under normal operating conditions.

Maximum incidental pressure (MIP): The maximum incidental pressure which can occur in a pipeline.

Mounting equipment: The assembly of parts uses to place and remove the sealing element (through the attachment) in the pipe.

Normal use: Normal use is the intended use of the product according to the instructions and condition of the supplier.

Period of use of tools: Period that the manufacturer indicates between two inspections.

Pressure: Overpressure in relation to atmospheric pressure.

Supplier: The party that is responsible for ensuring that products continuously meet the requirements on which the certification is based, being the certificate holder and / or manufacturer.

Test pressure: The pressure prescribed by the manufacturer to be applied during the inspection of inflatable sealing elements.

Workload: 90% (± 5%) of the maximum stroke to be made in practice.

See also the definitions mentioned in the GASTEC QA general requirements.

2.1 Parts of the mounting equipment and closing element – gasbladder

For the purpose of clarifying the terms used, illustrations and descriptions are given below, see the corresponding number.

1	*The setting tool for inserting and removing gas bladders.*
2	*The gauge rod with manometers*
3	*The sealing element*
4	*A Lance**
5	*A connecting element. The attachment is part of the connecting element in the illustration. **
6	*A saddle and high impact PVC pipe in which the bladder is placed.*
7	*The setting tools, gas bladder and saddle in separate parts.*

A combination of 4 and 5 is also possible

*

3 Material and product requirements

This chapter contains the material and product requirements that the raw materials, materials and products used shall meet.

3.1 Dimensions and materials

The used materials, composition, dimensions, and tolerances of the parts shall comply with the construction drawings of the manufacturer. These drawings shall be provided by the applicant.

3.2 Parts

3.2.1 General

The parts shall be internally and externally clean, smooth finished, free of burs and shall show no sign of defects. Externally sharp corners shall be avoided. This will be checked visually.

Tools and parts shall not fail or show more leakage during the normal use period and storage. The functional properties shall not be negatively influenced during the period of use.

Tools, parts, and devices shall not bring any not intended damage to the gas supplying system. Any used lubricant shall be silicone free.

3.2.2 Manometer

When manometers are used, they shall have a deviation of max 5% Rdg. and shall be clearly readable. When analog manometers are used the nominal pressure should be at 2/3 of the max readable value.

3.2.2.1 Manometer inflatable closing element

The manometers shall have the necessary inflation pressure of the closing element clearly marked. If for functioning of the closing element it is necessary to apply vacuum, the required vacuum shall be clearly marked.

3.2.3 Interchange ability of parts

The construction of the equipment shall be such, that parts which get worn during normal use can be changed by not specialized personnel.

3.2.4 Valves

Valves shall be able to be opened and closed with a quarter turn and shall be maintenance free.

3.2.5 Placing of closing element with use of top piece saddles

The parts which are necessary to place the closing element through the top piece in the pipe system (placing unit) shall be made that no damage or loss of functionality is brought to the valve and seat of the top piece.

3.2.6 Double versions of inflatable closing elements

When double versions of the inflatable closing element are used, the elements shall be able to be pressurized and controlled on the pressure separated. The construction of double versions shall be such way that the combination closing element, manometer and valve is clear. When the pressure between the 2 closing elements can be measured, the manometer shall comply with paragraph 3.2.7.

3.2.7 Measurement of the pressure in the gas distribution system

When the closing element has ability to measure the pressure in the gas distribution system, the used manometer shall comply with paragraph 3.2.2.

3.2.8 Un-pressurizing of the pipe part between sealing elements

When the sealing element has ability to un-pressurize the pipe part between sealing elements, then the valves shall comply with paragraph 3.2.4.

3.3 Materials

3.3.1 General

The materials for the equipment for temporarily closing of gas pipes shall be chosen that they can resist the, during normal use, occurring influences.

3.3.2 Metals

Metal parts shall be free from corrosion, burs, and other imperfections.

3.3.3 Rubber parts

Rubber sealings shall fulfil the requirements according to EN 682, type GAL or GBL.

3.3.4 Resistance against aging

The manufacturer shall declare the materials are suitable for normal use.

4 Performance requirements and test methods

This chapter contains the performance requirements and associated test methods that the products shall meet. This chapter also specifies the limit values, if applicable.

4.1 General

The test methods are intended to test the equipment with worst-case situations that may occur in practice. Should this goal not be achieved with the determination methods included here, then a modified / additional test protocol will be drawn up by the manufacturer in consultation with the certifying body. The certifying body and the manufacturer can take the initiative for this.

The tests are carried out at an ambient temperature of 23 ± 3 °C unless otherwise stated. For the test included in this approval requirement the test medium is pressure air.

Where PE or high impact PVC is mentioned in this approval requirement, GASTEC QA approved PE or high impact PVC products are meant. The work, such as the installation and removal of the closing devices, is carried out in accordance with the method stated in the user manual of the manufacturer.

Unless otherwise stated or initiated by Kiwa Nederland B.V., the tests on sealing elements are performed in triplicate on the smallest, middle and largest of the series.

This way of testing will represent the series but only under the condition that: the sizes of bladders in a series of sizes are made of the same materials at the same location, with the same production processes and the same quality management system. This is considered representative of the size series. If the conditions mentioned above are not met, all dimensions (of bladders) from a size series are subjected to the tests for each measure.

The tests on the placing equipment shall be carried out on each type.

Sealing element (for pipes)
Additionally, the tests shall be carried out on each type of lance of the system being presented for inspection.

(Inflatable) sealing element
Additionally, the tests to be carried out on a pipe diameter for which the work instructions (VIAG) or manufacturer's instructions prescribe a double sealing element shall also be carried out as such.

4.1.1 Allowed leakage value

As mentioned in Chapter 1, the 10% LEL refers to a working pit with, as assumed in this AR, 2 outflow openings. The permitted leakage quantity, the maximum leakage rate, per installed closing element is 0.075 m3/h for natural gas.

Because the test medium is air, an air: natural gas ratio of 1:1.54 is taken into account in the leak tests in order to calculate the value for this performance requirement. This results in a rounded maximum leakage rate of 50 dm^3/h for the leak tests performed with air. See also the table below.

The maximum leakage rate of 50 dm^3/h applies to the grid pressures of 30mbar, 100mbar and 200mbar.

Leakage value					
Gas outlet	Natural gas (m^3/h)	Natural gas (dm^3/h)	Air (m^3/h)	Air (dm^3/h)	Rounded, criterion (dm^3/h)
2 outflow openings	0.075	75	0.049	49	50

Table 2: stated leakage value for closing elements outside a building

4.1.2 Testing equipment

4.1.2.1 Pressure sensor

The for the tests to be used pressure sensor shall have an inaccuracy of ±5% Rdg. If a tolerance is mentioned with the test, this applies to the with the pressure sensor read value.

4.1.2.2 Force sensor

The for the tests to be used force sensor shall have an inaccuracy of ±5% Rdg. If a tolerance is mentioned with the test, this applies to the with the force sensor read value.

4.1.2.3 Flow measurement

Flows shall be established with an ±5% Rdg.

4.1.2.4 Other

The dimensions of the parts which are important for the functioning shall be checked with suitable tools with a measurement accuracy of at least 0.1 mm.

4.1.3 Appearance

The appearance and finish shall be visually reviewed. No burrs, corrosion, damage, and other imperfections may occur that may adversely affect the operation or cause injury when working with the tools.

4.2 Leak tightness

4.2.1 Leak tightness between gauge rod and sealing element

Between the connection of gauge rod and sealing element leakage is not allowed, after being made and broken 500 times. This test is aimed at the connection of the sealing element and gauge rod.

4.2.1.1 Test method:

1. Assemble and disassemble the connection for which the sealing is meant 500 times.
2. Apply an inflation pressure according to the instructions of the manufacturer.
3. Check the leak tightness with a non-aggressive (an according to AR 120 certified) leak detection product. There shall be no leakage visible.

4.2.2 Leak tightness of connections that move when inserting and removing the sealing element

The seal shall show no leakage after being fully inserted and removed 500 times.

4.2.2.1 Test method:

1. Move the sealing parts for 500 times over the total working stroke with a speed as expected in practice.
2. Apply an inflation pressure according to the instructions of the manufacturer.
3. Check the leak tightness with a non-aggressive (an according to AR 120 certified) leak detection product. There shall be no leakage visible.

4.2.3 Leak tightness sealing element: pipe systems inside buildings

The maximum leakage between closing element and pipe shall be 5 dm^3/h natural gas what correspondents with 3 dm^3/h air, when the sealing element is placed in a steel pipe. Using the air: natural gas ratio of 1:1.54, the rounded leak criterion of 3 dm^3/h air follows.

With inflatable sealing elements the inflatable pressure is equal to the working pressure.

4.2.3.1 Test method:

1. Place the sealing element in a steel pipe (closing element for other pipes). Bring an inflatable closing element to working pressure.
2. Apply a test pressure of 30 mbar.
3. Maintain this situation for 30 ± 5 minutes. The pressure of the closing element shall not be changed during testing.
4. Measure the leakage next to the closing element.
5. Repeat the above process with a pressure of 100 and 200 mbar.

4.2.4 Leak tightness sealing element: pipe systems outside buildings

The maximum leakage between sealing element and pipe shall be 75 dm^3/h natural gas what correspondents with 50 dm^3/h air (obtained by the ratio of air to natural gas of 1: 1.54), when the sealing element is placed in a nodular cast iron pipe.

This test is not carried out in a PVC HI pipe because PVC HI does not occur/is desirable in pipe networks intended for pressures higher than 200mbar.

4.2.4.1 Test method – nodular cast iron:

1. Place the sealing element in a nodular cast iron according to the instructions of the manufacturer.
2. Apply a test pressure of 30 mbar.
3. Maintain this situation for 30 ± 5 minutes. The possible pressure of the closing element shall not be changed during testing.
4. Measure the leakage next to the closing element.
5. Repeat the above process with a pressure of 100 and 200 mbar.

4.2.4.2 Test method - PE:

The maximum of leakage of the sealing element – pipe shall be 75 dm^3/h natural gas what correspondents with 50 dm^3/h air, when the sealing element is placed in a PE-pipe who at the placement of the sealing element is pressed oval for 10%.

1. Place the sealing element in a PE-pipe, according to the instructions of the manufacturer, which is at the placement of the closing element oval pressed by 10 ± 1%.
2. Apply a test pressure of 30 mbar.
3. Maintain this situation for 30 ± 5 minutes. The possible pressure of the closing element shall not be changed during testing.
4. Measure the leakage next to the sealing element.
5. Repeat the above process with a pressure of 100 and 200 mbar.

4.2.5 Leak tightness connection element – top piece

After inserting the connecting element five times through the valve seat of an attachment, the self-closing valve in the attachment shall not leak more than 5 dm^3 after removal of the connecting element.

4.2.5.1 Test method:

1. Bring the part under the non-return valve of the (GASTEC QA marked) top piece up to 300 mbar.
2. Check if the non-return valve functions normally.
3. Place the connecting element manually five times with a normal use speed.
4. Test, after placing the lance with the connection element for the fifth time, the leak tightness of the placing element – top piece with a non-aggressive (an according to AR 120 certified) leak detection product. There shall be no leakage visible.
5. Inspect visually the valve seat and check valve. These shall not be damaged, and the valve shall close.

4.3 In-use tests

4.3.1 Bending test

After loading the fully extended pressure gauge rod, a lateral force of 100 N shall be applied for 5 minutes, during which time there shall be no leakage, and the components shall show no damage. This force shall be applied at a point that results in the greatest possible bending moment.

4.3.1.1 Test method:

Below test shall be executed on a high impact PVC-pipe upon which a high impact PVC-Saddle with top piece is mounted.

1. Place the connection element in the top piece. The gauge rod is fully extended.
2. Apply a force of 100 N. The applied force shall be applied on the point that results in the greatest bending moment (extended position of the insertion element).
3. Maintain this situation for 5 minutes ± 30 seconds.
4. Remove the force and inspect the parts visually. The parts shall not be damaged. In addition, test the gauge rod and the attachment with a non-aggressive (an according to AR 120 certified) leak detection product. No leakage should be detectable.

4.3.2 Placing and pulling force

Sealing element (for pipes)
The force for placing and pulling of the sealing element shall not be higher than 230 N. The placing and pulling of the sealing element shall take maximal 5 minutes each.

4.3.2.1 Test method:

The next test shall be carried out using the biggest allowed sealing element for the smallest allowed pipe combination.

1. Place the sealing element in the pipe. Measure the applied force.
2. Measure the time needed for placing.
3. Bring an inflatable sealing element on working pressure.
4. Leave the sealing element for 4 hours ± 5 minutes in the pipe.
5. Pull the sealing element out of the pipe. Measure the applied force.
6. Measure the time needed for pulling the sealing element.

4.3.3 Slide resistance

The closing element (depending on the version in combination with the gauge rod) placed in a high impact PVC pipe or PE pipe shall not slide visually during 1 hour with a pressure of 300 mbar. The placement is according to the manufacturer's instructions.

For inflatable closing elements the working pressure shall not be adjusted during testing.

4.3.3.1 Test method:

1. Place the closing element with the placing unit in a high impact PVC pipe or PE pipe. With inflatable closing elements the inflation pressure is equal to the working pressure
2. Apply a pressure of 300 mbar of the pipe, on one side of pipe.
3. Determine after stabilizing the test set up the position of the closing element.
4. Maintain the test pressure for 1 hour ±10 minutes.
5. Determine the position again of the sealing element.

4.3.4 Resistance against damage

4.3.4.1 Resistance against overpressure of the sealing element

The inflatable sealing element shall be able to resist 1.5 times the inflation pressure for 30 minutes. The inflatable element shall be supported by the pipe during the test. The sealing element shall not succumb as a consequence of testing. The pressure shall not decrease during the test.

4.3.4.4.1 Test method:

1. Place the inflatable element in a pipe with the largest diameter for which the closing element is suitable.
2. Apply the inflatable element to 1.5 times the inflation pressure as provided by the manufacturer.
3. Wait for 60 ± 5 seconds and note down the pressure.
4. Wait another 30 ± 5 minutes, and note down the pressure again.

4.3.4.2 Resistance to tightness control before use

The inflatable sealing element shall be able to withstand the inflation pressure specified by the manufacturer for 30 minutes, not installed in a pipe, unless the manufacturer expressly stipulates that this test may only be carried out in a pipe before use. The test shall not cause any damage. The pressure shall not have decreased.

4.3.4.2.1 Test method:

1. Inflate the inflatable element to the pressure specified by the manufacturer (the pressure for the leak test).
2. Wait for 60 ± 5 seconds and note down the pressure.
3. Wait another 30 ± 5 minutes and note down the pressure again.

4.3.4.3 Resistance against static tensile force

The connection the gauge rod and sealing element suitable for distribution pipelines shall resist a tensile force of 800 N during a period of 5 minutes without any damage.

4.3.4.3.1 Test method:

1. Insert the inflatable sealing element first into the pipe at the inflation pressure as specified by the manufacturer.
2. Apply a force to the connection placing unit/closing element of 800 N following figure 4. Apply working pressure first on an inflatable closing element.
3. Maintain this situation for 5 minutes ± 30 seconds.
4. Remove the load and inspect the element visually.
5. If applicable, repeat the test for a double inflatable element.

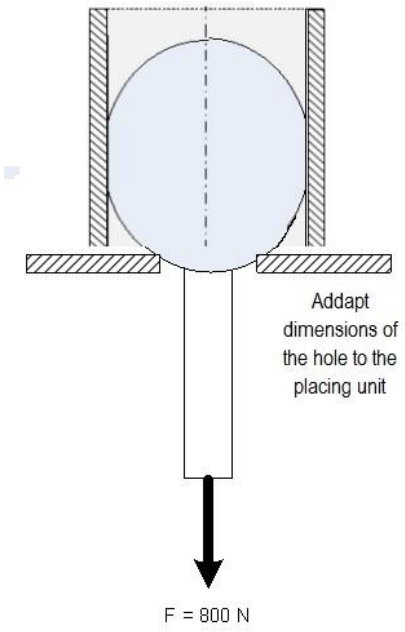

Figure 4

4.3.4.4 Resistance against rupture

Inflatable sealing elements

If in a sealing element, which is at inflation pressure, a hole of 1 mm is made, this hole shall not grow further with a constant pressure.

4.3.4.5.1 Test method

1. Apply a working pressure on the sealing element in a pipe.
2. Make a hole with a diameter of 1 mm in the sealing element on the place as mentioned in figure 5.
3. Apply the working pressure for 1 minute ± 10 seconds on the sealing element.
4. Inspect the sealing element visually.

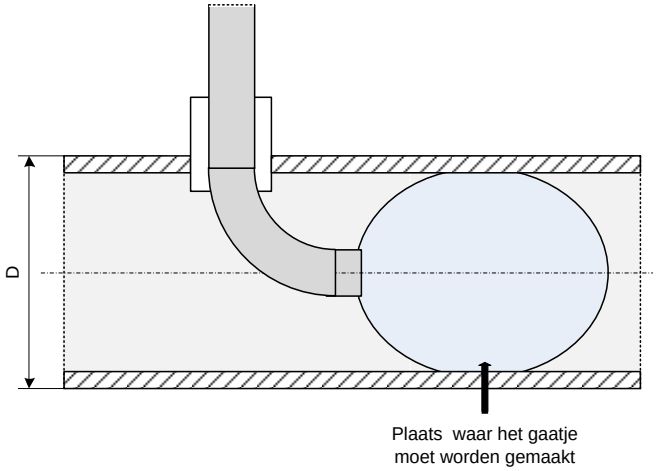

Figure 5: Place where the hole shall be made

4.3.4.5 Resistance against gas flow during placing

Closing element for distribution lines

The connection between placing unit and closing element shall resist the force occurring during placing of the closing element in a gas flow of 20 m/s. This test is repeated 5 times.

After the test the closing element shall fulfil the requirements of paragraph 4.2.5.1. This test is carried out in a PVC HI pipe because PVC HI is most common/desired in pipe networks intended for pressures equal to and lower than 200 mbar.

4.3.4.6.1 Test method

Below test shall be carried out on a high impact PVC pipe with the largest diameter for which the closing element is suitable and upon which a high impact PVC saddle with top piece is mounted for closing elements for main lines.

1. Create an air speed (or gas speed) of 20 m/s in the pipe.
2. Place the closing element according to the manufacturer's instructions in the pipe.
3. Check, if applicable, the placement direction after the first time placing and after the last time placing. This should comply with the predetermined direction.
4. Repeat this 5 times.
5. Subject the sealing element finally to paragraph 4.2.5.

Alternative

Closing element for distribution lines

Alternatively, the connection between placing unit and closing element shall resist 1.5 times the calculated force occurring during placing of the closing element in a gas flow of 20 m/s with a minimum of 800 N. This test is repeated 5 times. (see paragraph 4.3.4.3)

5 Marking and instructions

5.1 Marking

On the equipment (and loose parts) the following shall be durable affixed:

- Name of the manufacturer
- Production date eventually in code.
- GASTEC QA, GASTEC QA logo, or punch mark.
- At inflatable sealing elements the inflation pressure.
- In case closing elements are intended for use inside buildings this shall be marked as such.

Additional for closing elements for pipe systems:

- The pipe system diameter or diameter range for which the closing element is suitable.

5.2 Instructions

The applicant of the approval shall provide a user manual. In this manual minimal following shall be laid down:

- The right use of the equipment.
- The reference to and additions on the specific functional recommendation described in the VWI (safety work instruction) G-24 of the VIAG.
- The right way of control, preparation placing and removing of the closing element.
- The right combination of parts with their dimension range shall be indicated clearly.
- Point of particular interest shall be the avoiding of problems.
- The type of pipe (Cast iron, high impact PVC, PE) and the MOP of the pipe in which the tool may be used.
- The most important points of particular interest shall be mounted non-erasable in the box or case.
- The way of storage and handling of the equipment.
- The period of use of the equipment.
- If applicable the number of applications of (parts) of the closing element.
- The maintenance and control on the equipment necessary to ensure safe working. Among what a summary of parts and the way how these shall be inspected.
- The user's manual shall be provided with (revision) date and document number.

The manual shall be in Dutch language in clearly expressions eventually with pictures. If the product is not marketed in the Netherlands, the manual will in any case be delivered in English and in the national language of the country in which the product is used.

In addition: in the manual shall also be included how and when the maintenance of the equipment shall be carried out and by whom the maintenance of the equipment can be carried out.

6 Quality system requirements

The requirements for the quality system are described in the GASTEC QA general requirements. An important part of this are the requirements for drawing up a risk analysis (e.g., an FMEA) of the product design and the production process in accordance with chapters 3.1.1.1 and 3.1.2.1. This risk analysis shall be available for inspection by Kiwa.

7 Summary of evaluation

This chapter contains a summary of the evaluation to be carried out during:

- The initial product assessment;
- The periodic product verification;

7.1 Evaluation matrix

Description of requirement	Clause	Investigation within the scope of		
		Initial product assessment	Product verification	
			Inspection	Frequency
Product requirements				
Dimensions and materials	3.1	X	X	Each year
Parts	3.2			
General	3.2.1	X		
Manometer	3.2.2	X		
Interchangeability of parts	3.2.3	X		
Valves	3.2.4	X	X	Each year
Placing of sealing elements with use of top piece saddles	3.2.5	X		
Double versions of inflatable sealing elements	3.2.6	X		
Measurement of the pressure in the gas distribution system	3.2.7	X		
Un-pressurizing the pipe parts between closing elements	3.2.8	X		
Materials	3.3			
General	3.3.1	X		
Metals	3.3.2	X	X	Each year
Rubber parts	3.3.3	X	X	Each year
Resistance against aging	3.3.4	X		
Performance requirements	4			
General	4.1			
Leak tightness	4.2	X		
Leak tightness between gauge rod and sealing element	4.2.1	X	X	Each year
Leak tightness of connections that move when inserting and removing the sealing element	4.2.2	X	X	Each year
Leak tightness closing element – pipe systems inside buildings	4.2.3	X		
Leak tightness closing element – pipe systems outside buildings	4.2.4	X		
Leak tightness placing unit – top piece	4.2.5	X	X	Each year

Description of requirement	Clause	Investigation within the scope of		
		Initial product assessment	Product verification	
			Inspection	Frequency
In-use test	4.3			
Bending test	4.3.1	X		
Placing and pulling force	4.3.2	X		
Slide resistance	4.3.3	X	X	Each year
Resistance against damage	4.3.4	X		
Resistance against inflation pressure	4.3.4.1	X	X	Each year
Resistance to tightness before use	4.3.4.2	X	X	Each year
Resistance against static tensile force	4.3.4.3	X	X	Each year
Resistance against rupture	4.3.4.4	X	X	Each year
Resistance against gas flow during placing	4.3.4.5	X		
Marking	5.1	X	X	Each year
Instructions (user manual)	5.2	X		

8 List of referenced documents and source

8.1 Standards/ normative documents

Number	Title	Version *
NEN 7244-Series	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar	
EN 682	Elastomeric seals - Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids	2002 + A1: 2005

*) If no date of issuance is specified in this column, the current version of the document applies.

8.2 Source of informative documents

Number	Title	Version *
Hydelta 2 WP6B – Safety – suitability of assets and Working Methods	D6B.2A - Report on ignition scenarios when using inflatable gas stoppers // D6B.2B - Report on ignition test results	24-04-2023
Veiligheidsinstructie Aardgas (safety instructions natural gas)	De VeiligheidsInstructie AarGas voor de Energiebedrijven – www.beiviag.nl/viag	
Veiligheidwerkinstructie (safety work instruction) G-24	Gasblazen in LD-leidingen veilig plaatsen en verwijderen	15-04-2023
General requirements GASTEC QA		

*) If no date of issuance is specified in this column, the current version of the document applies.