

BRL-K604/06
01-02-2012

Evaluation guideline

for the Kiwa product certificate for
Stop- and connecting cocks



Preface

This evaluation guideline has been accepted by the board of experts CWK of Kiwa, in which the parties concerned in the sector Drinkingwater appliances are being represented. This Board of Experts also supervises the certification activities and where necessary requires the evaluation guideline to be revised. All references to Board of Experts in this evaluation guideline pertain to the above mentioned Board of Experts.

This evaluation guideline will be used by Kiwa in conjunction with the Kiwa-Regulations for Product Certification. This regulation details the method employed by Kiwa for conducting the necessary investigations prior to issuing the product certificate and the method of external control.

This evaluation guideline is to be assessed by the Board of Experts at least every 5 years, but at the latests before 1 February 2017.

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

Validation

This evaluation guideline has been validated by Kiwa on 1 February 2012.

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1 Introduction

1.1 General

This evaluation guideline includes all relevant requirements which are adhered to by Kiwa as the basis for the issue and maintenance of a certificate for stop- and connecting cocks.

This evaluation guideline replaces BRL-K604/05 dated 23 November 2006.

For the performance of its certification work, Kiwa is bound to the requirements as included in EN45011, clause 4.6 "conditions and procedures for granting, maintaining, extending, suspending and withdrawing certification".

1.2 Field of application / scope

This evaluation guideline applies to:

- stop cocks with disc, with a nominal diameter up to DN 100,
- other stop cocks with a nominal diameter up to DN50,
- connecting cocks with a nominal diameter up to DN 15.

Stop- and connecting cocks are designed to be used in tap water installations with a maximum working pressure of 1000 kPa and a water temperature with a maximum of 65°C. Using the products in water installations with a water temperature up to 90°C is possible. However, this may influence the durability of some parts and the contact temperature of the operation handle.

Stop- and connecting cocks can be distinguished in the following designs 1;

Stop cocks with disc;

Stop cocks with membrane;

Stop cocks with plug;

Stop cocks with ball;

Stop cocks with gate;

Stop cocks with central, eccentric and doubly eccentric revolving closing element;

Connecting cocks.

1.3 Acceptance of test reports provided by the supplier

When by the manufacturer reports from test Institutions or laboratories are produced in order to demonstrate that the product meets the requirements of this evaluation guideline, the institute or laboratory shall meet one of the applicable accreditation norms, being;

- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17020 for inspection bodies;
- NEN-EN 45011 for certification bodies certifying products;

This requirement is being considered to be fulfilled when a certificate of accreditation can be shown, either issued by the Board of Accreditation (RvA) or one of the institutions with which the RvA an agreement of mutual acceptance has been concluded.

The accreditation shall refer to the examination as required in this BRL. When no certificate of accreditation can be shown, Kiwa will verify whether the accreditation norm is fulfilled.

¹ other designs than those mentioned are possible.

1.4 Quality declaration

The quality declarations to be issued by Kiwa are described as Kiwa product certificate.
A model of the certificate to be issued on the basis of this Evaluation Guideline has been included as an Annex.

2 Terms and definitions

In this evaluation guideline the following terms and definitions are applicable:

Evaluation Guideline: the agreements made within the Board of Experts on the subject of certification.

Board of Experts: The Board of Experts "CWK".

Supplier: the party that is responsible for ensuring that the products meet and continue to meet the requirements on which the certification is based.

IQC scheme: a description of the quality inspections carried out by the supplier as part of his quality system.

Product requirements: requirements made specific by means of measures or figures, focusing on (identifiable) characteristics of products and containing a limiting value to be achieved, which limiting value can be calculated or measured in an unequivocal manner.

Pre-certification tests: tests in order to ascertain that all the requirements recorded in the Evaluation Guideline are met.

Inspection tests: tests carried out after the certificate has been granted in order to ascertain whether the certified products continue to meet the requirements recorded in the Evaluation Guideline.

Remark

The test matrix contains a summary showing what tests Kiwa will carry out in the pre-certification stage and in the event of inspections as well as showing the frequency with which the inspection tests will be carried out.

Product certificate: a document, in which Kiwa declares that a product may, on delivery, be deemed to comply with the product specification recorded in the product certificate.

Tap water (origin NEN 1006:2002): water intended for drinking, cooking, food preparation or other domestic purposes.

3 Procedure for granting the quality declaration

3.1 Pre certification tests

The pre certification-tests to be performed are based on the (product) requirements as included in this evaluation guideline including the test methods and contain, depending on the nature of the product to be certified:

- Type testing to determine whether the products comply with the product and/or functional requirements,
- Production Process Assessment,
- Assessment of the quality system and the IQC-scheme,
- Assessment on the presence and functioning of the remaining procedure.

3.2 Granting the quality declaration

After finishing the pre-certification tests the results are presented to the person deciding on granting of certificate. This person evaluates the results and decides whether the certificate can be granted or additional data and/or tests are necessary.

4 Requirements and test methods

4.1 General

This chapter contains the requirements the stop- and connecting cocks have to fulfil. These requirements will make part of the technical specification of the products, as included in the certificate.

4.2 Materials

4.2.1 Toxicological requirements

Products and materials, which (may) come into contact with drinking water or warm tap water, shall not release substances in quantities which can be harmful to the health of the consumer or negatively affect the quality of the drinking water. Therefore, the products or materials shall meet the toxicological, microbiological and organoleptic requirements as laid down in the valid "Ministerial Regulation materials and chemicals drinking water and warm tap water supply" (published in the Government Gazette). Consequently the procedure for obtaining a recognised quality declaration, as specified in the valid Regulation, has to be concluded with positive results.

Products and materials with a quality declaration*, e.g. issued by a foreign certification institute, are allowed to be used in the Netherlands, provided that the Minister has declared this quality declaration equivalent to the quality declaration as meant in the Regulation.

4.2.2 Chemical and mechanical requirements

4.2.2.1 Rubber

Rubber shall comply with the requirements of BRL-K17504 regarding the influence on the quality of drinking water, the physical- and mechanical properties. For closing elements such as rubber sealings on discs or membranes that are made of rubber, BRL-K17504 is not applicable. Natural rubber (NR) and isoprene rubber (IR) are not allowed to be used.

4.2.2.2 Zink-aluminiumlegeringen

Zinc-aluminum alloys are only to be used for control devices and shall be coated with an anti-corrosive protection layer.

4.2.3 Corrosion resistance

The applied materials shall be corrosion resistant or protected against corrosion. The materials used may not have an adverse effect on each other.

4.2.3.1 Metallic protection layers

Applied metallic anticorrosive protection layers shall fulfill the requirements of EN 248.

4.2.3.2 Plastic coatings

After a test according to 5.1, the coating shall meet;

- EN 248, article 7.1.1 in relation to the corrosion resistance,
- ISO 2409, table 1, class 0 or 1 in respect of the adherence.

* A quality declaration issued by an independent certification institute in another member state of the European Community than the Netherlands or another state party to the agreement to the European Economic Area, is equivalent to a recognised quality declaration, to the extent that, to the judgment of the Minister of the first mentioned quality declaration, is fulfilled the at least equivalent requirements as meant in the Regulation materials and chemicals drinking water- and warm tap water supply.

4.3 Seals

Seals are divided into:

- a. *static seals*
 - between the bonnet and the body
 - between removable seat and body
- b. *dynamic seals*
 - for the passage of the spindle
 - between the ball and the body (in ball valves)

4.3.1 *Static seals*

Seals should be safeguarded against being displaced¹.

4.3.1.1 *Seal between bonnet and body*

One of the following materials shall be used for the seal between the bonnet and the body:

- soft copper
- hard fiber
- rubber.

4.3.1.2 *Seals between removable seat and body*

At least one of the following rings shall be used for the seal between the removable seat and the body:

- soft-copper
- rubber (o-rings)
- PTFE (Teflon).

4.3.2 *Dynamic seals*

4.3.2.1 *Seals for the passage of the spindle*

One of the following seals can be used to seal the passage of the spindle:

- stuffing box
- rubber O-ring
- comparable low-friction ring(s).

4.3.2.2 *Seal between ball and body*

For seals between the ball and the body (in ball valves) O-rings or profiled rings shall be used.

4.3.3 *Seals with stuffing box and gland*

In stop cocks with a stuffing box, a gland shall be used to ensure that the pressure on the packing in the stuffing box is equal. the gland must be designed so that it can be displaced to enable the packing in the stuffing box to be replaced. The wrench flats on the gland shall be at least 3 mm high.

If a loose wrench is used, the stop cock should still be able to be used if the gland has just been removed from the packing recess. The wall thickness of the packing recess shall be at least 2 mm for stop cocks up to and including DN25 and 2,5 mm for other stop cocks.

The internal diameter of the gland and the diameter of the bore in the floor of the recess should be at least 0.2 mm larger than the diameter of the spindle with stop cocks up to and including DN25 and 0.4 mm for larger stop cocks.

¹ This requirement can be fulfilled by seating sealing rings in a recess, or by finishing one of the pressure edges of the ring at an angle of at least 2° inwards.

4.4 Operation

4.4.1 Operation mechanism

There shall be no tangible play in the fixing of the operation mechanism. The mechanism may be attached with a clamp fitting or with other types of fitting. If a clamp or click fitting is used, the pull-off strength shall lie between 50 and 200 N.

Table 1 shows the minimum required lengths of the wrench or diameter of the hand wheel.

4.4.2 Spindle (*irrelevant to connecting cocks*)

The spindle can be of a non-rising or a rising design. The transmission thread shall be self-braking and have an external diameter of at least 10 mm. It may have a single or double pitch of between 2 and 4 mm.

4.4.3 Closing direction

The stop- and connecting cocks shall close by turning right.

4.4.4 Rotation operation mechanism

For stop cocks larger than DN25 the operating mechanism shall complete a turn of at least 270° to close the stop cock from a completely open position.

4.4.5 Dust cover (*only applicable for connecting cocks*)

Connecting cocks may be fitted with a dust cover. This shall be removable. Cocks fitted with a dust cover shall be able to be operated without the necessity of specialist tools. The dust cover may also be used to operate the cock.

4.5 Dimensions and end joints stop cocks with disc or ball

The requirements in respect of construction and design which stop cocks with disc shall meet have been laid down in the following standard:

EN 1213	Building valves - Copper alloy stop valves for potable water supply in buildings - Tests and requirements.
EN 13828	Building valves - manual operated ball valves of copper alloys and stainless steel for potable water supply in buildings - test procedures and requirements.

4.6 Dimensions and end joints other stop- and connecting valves

4.6.1 Nominal diameter

The nominal diameter (DN) of the stop cocks shall meet Table 1.

4.6.2 End joints stop cocks

Stop cocks shall have two of the following end joints:

- internal thread,
- external thread,
- press-, compression- or push-in joints,
- secured union nut,
- flange.

The stop cock can be fitted with similar or different end joints.

In Table 1 the threads to be used and the external diameters of the pipes for the fittings are specified.

Table 1 - End joint dimensions

	Length stem / diameter hand wheel	joint thread				width pressure area	compression joints external diameter copper pipes
		internal	external	External with shoulder	union nut		
DN	mm	ISO 7-1	ISO 7-1	ISO 228-1	ISO 228-1	mm	mm
10	≥40	Rp 3/8	R 3/8	G 3/8	G 1/2	3	12
15	≥40	Rp 1/2	R 1/2	G 1/2	G 3/4	3	15/18
20	≥60	Rp 3/4	R 3/4	G 3/4	G 1	3	22
25	≥60	Rp 1	R 1	G 1	G 1 1/4	3	28
32	≥70	Rp 1 1/4	R 1 1/4	G 1 1/4	G 1 1/2	4	35
40	≥70	Rp 1 1/2	G 1 1/2	G 1 1/2 or 1 3/4	G 2	4	42
50	≥70	Rp 2	G 2	G 2 or G 2 3/8	G 2 1/2	4	54

4.6.3 End joints of connecting cocks

Connecting cocks shall be fitted with the following types and sizes of end joints, or combinations of these:

- In- or external capillary soldered joint 10 mm or 12 mm;
- compression joints for copper pipes with an external diameter of 10 or 12 mm;
- internal or external threaded joints. G^{3/8} or G^{3/8}A respectively;
- secured union nut with a G^{3/8} thread.

If one of the end joints is one of the above mentioned, the other may be one of the following:

- internal or external capillary soldered joint with a diameter of 15 mm.
- compression joint for a copper pipe with an external diameter of 15 mm;
- internal or external thread (G^{1/2} or G^{1/2}A respectively);
- secured union nut with a G^{1/2} thread.

Cocks whose design only allows them to be used as connecting cocks may be fitted with end joints in sizes suitable for specific applications.

Connecting cocks may at one side be furnished with an integrated flexible connecting hose. This hose shall be connected indissoluble to the connecting cock and comply with the requirements as mentioned in the evaluation guideline BRL-K622 "Flexible connecting hoses".

4.6.4 Construction end joints

4.6.4.1 Threaded joints

Threads shall comply with ISO 7-1 or ISO 228-1.

The length of the thread and the total length of end joints with an external thread shall comply with evaluation guideline BRL-K623.

4.6.4.2 Press-, compression- or push-in joints

Connecting ends provided with press-, compression- or push-in joints shall meet the requirements as included in the Kiwa evaluation guideline BRL-K640.

4.6.4.3 End joints with a secured union nut

The usable thread length after fitting shall meet the minimum requirements laid down in Kiwa evaluation guideline BRL-K623.

The end joints shall be cylindrical for a length at least equal to the depth of the union nut, measured from the ends of the pressure areas for the packing. The width of the pressure areas for the packing and the threads used shall be conform Table 1.

4.6.4.4 Flanged joints

Stopcocks fitted with flanged joints shall be conform to DIN 2501, part 1.

4.7 Construction and design for stop cocks with ball

4.7.1 General

The requirements regarding the construction and shape of ball stop cocks have been laid down in the following standard:

EN 13828 Building valves - manual operated ball valves of copper alloys and stainless steel for potable water supply in buildings - test procedures and requirements.

4.7.2 Construction ball

The culvert of the ball shall be cylindrical.

4.7.3 Drainage connection

Ball stopcocks may be furnished with two drainage connections for connecting a draincock. This shall be sited opposite to each other and downstream of the closing element. The inner thread shall be G¹/₄, according ISO 228-1 with a minimal length of a thread of 7 mm (minimal length threaded end 8 mm). The culvert shall be minimal 6 mm. The outer diameter of the drainage connection shall be minimal 17 mm.

4.8 Construction and shape other stop- and connecting cocks

4.8.1 Body wall thickness

The wall thickness of brass or bronze bodies shall meet at least table 2.

Table 2 - Minimum wall thickness

DN size mm	Wall thickness	
	cast W min*)	hot pressed W min*)
<10**)	1,0	1,0
10**)	1,2	1,1
15	1,4	1,2
20	1,6	1,4
25	1,8	1,5
32	1,9	1,6
40	2,2	1,8
50	2,3	2,0

*) Minimum wall thickness W is applicable for the entire body

**)

4.8.2 Wrench flats

The minimal height of the wrench flats shall be conform evaluation guidelines BRL-K623.

4.8.3 *Direction of flow*

In closed position the passage of the spindle shall not be subjected to the pressure load upstream of the obturator.

4.8.4 *Drainage connections*

Stop- and connecting cocks may be fitted with two drainage connections for drainage cocks. These must be fitted opposite each other on the outlet side of the closing mechanism. The internal thread shall be G¹/₄, according to ISO 228-1 with a minimum thread length of 7 mm (minimum length threaded end 8 mm). The culvert shall be at least 6 mm and the external diameter at least 17 mm.

4.8.5 *Appearance and finish*

Stop- and connecting cocks shall be cleaned well and be free of machined material. Grooves, cracks and pits are not allowed. Lubricant should be applied where necessary.

4.8.6 *The seal fitting*

If the seal is fitted by means of thread, this thread shall not come into contact with the water.

4.8.6.1 *Fastening of the disc (only applicable for stopcocks with disc)*

The control spindle shall be revolving in respect to the disc. If a raising control spindle is applied the axial tolerance between disc and spindle should not exceed 0,2 mm. Tolerance shall be extant when the stop cock is full open and the control spindle, when in the position "full open" the disc is loosen, guided for at least 4 mm.

If the disc washer is removed the control thread of the spindle shall be fully operational in the position "completely closed", so that the stop valve can be opened as usual.

4.8.6.2 *Fastening of the pressure piece (only applicable for stop cocks with membrane)*

The pressure piece shall only be moved in the axial direction corresponding with the direction of the spindle.

4.8.6.3 *Fastening of the plug (only applicable for stop cocks with plug)*

The plug is allowed to move in axial direction only, corresponding with the spindle.

4.9 **Functional requirements and test methods for stop cocks with disc**

4.9.1 *General*

The functional requirements and test methods for stop cocks with disc have been laid down in the following standard:

EN 1213 Building valves – Copper alloy stop valves for potable water supply in buildings – Tests and requirements

Hereby shall be remarked that when conducting the test according NEN-EN1213, article 7.3.1, the required pressure shall gradually be applied to the valve within 15 seconds.

4.9.2 *Durability*

In addition to what has been mentioned in NEN-EN 1213:1999, article 7.5, the sample under test shall also be submitted to 5000 cycles with water with a temperature of 65 ± 3°C.

Valves with a nominal diameter bigger then DN20 shall be tested in accordance to NEN-EN 1213, article 7.5 with water with a maximum temperature of 30°C, followed by 5000 cycles with water with a temperature of 65 ± 3°C. During this test the valve shall be closed with a closing torque of 5 Nm.

4.9.3 *Resistance against high temperature*

After a long period in one position, the stop cock shall be able to open or close without jamming. This must be checked according to 5.5. After testing in accordance with 4.6 the stop cock shall be opened

completely with a torque of maximum 10 Nm. After the stop cock is opened and closed one time completely, the stop cock shall comply with 4.11.2. During or after these tests no damage may occur.

4.10 Functional requirements and test methods stop cocks with ball

4.10.1 General

The functional requirements and additional testing methods for stopcocks with ball are regulated in the following standard:

EN 13828 Building valves - manual operated ball valves of copper alloys and stainless steel for potable water supply in buildings - test procedures and requirements.

4.10.2 Durability

In the contrary to what has been mentioned in NEN-EN13828, article 7.6 and table 14, the 10.000 cycles shall be carried out with water with a temperature of $20 \pm 3^\circ\text{C}$, followed by 5000 cycles in with water with a temperature of $65 \pm 3^\circ\text{C}$.

4.10.3 Resistance against high temperature

After a long period in one position, the stop cock shall be able to open or close without jamming. This must be checked according to 5.5. After testing in accordance with 4.6 the stop cock shall be opened completely with a torque of maximum 10 Nm. After the stop cock is opened and closed one time completely, the stop cock shall comply with 4.11.2. During or after these tests no damage may occur.

4.11 Functional requirements other stop- and connecting cocks

4.11.1 Flow rate

4.11.1.1 Flow rate stop cocks

The flow rate of straight-through stop cocks (if applicable) shall, at a pressure loss of 100 kPa and with the stop cock completely open, at least comply with Table 3.

The flow rate of angle stop cocks shall be at least 75% of the flow required for the straight version.

Table 3 - Flow rate at a pressure loss of 100 kPa (l/s)

DN	Stop cock with membrane or plug	other stop cocks
15	0,84	1,7
20	1,95	3,1
25	2,8	5,6
32	4,2	9,4
40	8,4	12,5
50	12,5	21

4.11.1.2 Flow rate connecting cocks

The flowrate of the connecting cock, with the cock completely open and with a loss of pressure of 100 kPa, shall be at least 0.3 l/s.

4.11.1.3 Resistance to high volumes of flow (only applicable for connecting cocks)

The connecting cocks shall be resistant to high volumes of flow. This shall be determined as described in section 5.3. During and after this test, the cock shall comply with the requirements 4.11.2 regarding closure and watertightness.

4.11.2 Closure and watertightness

After the tests described in section 5.1, the stop cock shall show no leakage or any sign of damage, and should not allow any water to pass when it is in the closed position.

4.11.3 Resistance to high temperatures

After a long period in one position, the stop cock shall be able to open or close without jamming. This must be checked according to 5.5. After testing in accordance with 4.6 the stop cock shall be opened completely with a torque of maximum 10 Nm. After the stop cock is opened and closed one time completely, the stop cock shall comply with 4.11.2. During or after these tests no damage may occur.

4.11.4 Resistance to forces and moments

4.11.4.1 Resistance to forces and moments on the operation mechanism

During the test described in section 5.6.1 the operation mechanism and/or stop cock shall show no fractures or deformations. After the tests, the stop cock shall comply with 4.11.2.

4.11.4.2 Resistance to forces and moments on the end joints

End joints shall show no fractures or deformations as a result of the tests described in section 0. After these tests, the stop cock shall comply with 4.11.2.

4.11.5 Durability

The operation mechanism and its connection shall show no fractures or deformations as a result of the tests described in section 5.7. After the tests, the stop cock shall comply with 4.11.2.

5 Test methods

5.1 Determination of the adherence and durability of plastic coatings

5.1.1 Test installation and appliances

For the determination of the adherence and the durability of the plastic coating, first the test pieces have to be conditioned in a bath of which the water is automatically maintained at the temperature required.

The appliances used for the determination of the adherence are to be according to ISO 2409.

5.1.2 Test piece

At least two mixer bodies or two control elements, but the number of test pieces must be such that the surface to be tested is at least 10 000 mm².

5.1.3 Test requirements

During the conditioning of the test pieces:

- the water in the bath shall be $90 \pm 3^\circ\text{C}$;
- the ambient temperature shall be $20 \pm 10^\circ\text{C}$.

5.1.4 Procedure

- a. Put the test pieces in the water bath for 1 hour.
- b. Cool the test pieces down to ambient temperature.
- c. Determine the adherence of one test piece according to NEN 5337-6.2.
- d. With the remaining test pieces it is to be determined whether they comply with EN 248.

5.2 Preparation for stop cocks with stuffing box

If a stuffing box is applied as a spindle seal, the packing shall be put under pressure before the following tests are carried out:

- durability;
- resistance to forces and moments on the stem;
- sealing and watertightness.

5.2.1 Apparatus

To adjust the stuffing box, the stop cock shall be installed in a test apparatus in which the correct pressure can be obtained with a flow of water.

Before the test all air shall be expelled from the apparatus.

The water pressure shall be measured with a precision meter according to NEN 927:1963.

5.2.2 Method

- a. Open the stop cock 50%, fill it with water and close off the outlet end.
- b. Apply and maintain a pressure of 1000 kPa to the stop cock.
- c. Loosen the gland until it starts to leak.
- d. Tighten the gland to the point at which the leak stops.

5.3 Test of resistance to high volumes of flow

5.3.1 Test conditions

During this test, the following conditions shall be fulfilled:

- the pressure on the inlet side of the cock shall be 1000 kPa;
- the water temperature shall not exceed 30°C .

5.3.2 Method

Carry out 5 consecutive cycles. Each cycle shall consist of the following:

- a. open the connecting cock with a rotation frequency of 0.5 ± 0.2 Hz;
- b. close the connecting cock with a rotation frequency of 0.5 ± 0.2 Hz.

5.4 Test for closure and watertightness

5.4.1 Apparatus

To test the closure and watertightness of the stop- or connecting cock, it shall be installed in a test apparatus in which the correct pressure can be obtained with a flow of water.

Before the test all air shall be expelled from the apparatus. The water pressure shall be measured with a precision manometer according to NEN 927:1963.

5.4.2 Test piece

A new test piece.

5.4.3 Methods

5.4.3.1 Testing the closure

- a. Open the stop- or connecting cock and fill it with water.
- b. Close the stop- or connecting cock.
- c. Apply during 5 s a clockwise moment of 2 Nm for stop cocks up to DN 25, respectively 4 Nm for stop cocks larger than DN 25 and 1 N m for connecting cocks.
- d. Gradually apply an inlet pressure of 1600 kPa within 15 s and maintain this pressure for 60 s.
- e. Decrease the pressure to 20 kPa, if an O-ring is used for the seal, and maintain this for a further 60 seconds.

5.4.3.2 Testing the watertightness

- a. Open the stop- or connecting cock and fill it with water.
- b. After expelling all the air, close the outlet side.
- c. Gradually apply an inlet pressure of 1600 kPa within 15 s and maintain this pressure for 60 s. Decrease the pressure to 20 kPa, if O-rings are applied, and maintain this for 60 s.

5.5 Test for resistance against high temperature

5.5.1 Apparatus

In order to execute the examination of the jamming of the closing device the stop- or connection cock must be installed in a test installation in which the required pressure can be obtained with water.

Before the examination the test installation must be desaired. The water pressure must be measured with a precision manometer according to NEN 927.

5.5.2 Test piece

The test shall be carried out on a sample that was not submitted to other tests.

If a stuffing box is used as a spindle seal, the packing shall be adjusted according to article 5.2.

5.5.3 Test conditions and methods

5.5.3.1 Requirements

During the examination the following conditions shall be fulfilled:

- the water temperature shall be $90 \pm 3^\circ\text{C}$
- the static pressure with the stopcock in closed position shall be 1600 kPa.

5.5.3.2 Method in closed position

- a. Rinse the stop cock with water.
- b. Close the stop cock (up to DN25) with a torque of 2 Nm. Stop cocks larger than DN 25 shall be closed with a torque of 4 Nm.

- c. Gradually apply a pressure of 1600 kPa to the inlet side within 15 s and maintain this pressure.
- d. Place the stop cock for 240 hours in a bath with water with a temperature of $90 \pm 3^\circ\text{C}$.
- e. Cool down the stop cock at ambient temperature ($20 \pm 5^\circ\text{C}$) and reduce the pressure to ambient pressure.
- f. Open the stop cock completely and measure the maximum required torque.

5.5.3.3 Method in open position

- a. Open the stop cock (up to DN25) with a torque of 2 Nm. Stop cocks larger than DN 25 shall be closed with a torque of 4 Nm.
- b. Place the stop cock for 240 hours in a bath with water with a temperature of $90 \pm 3^\circ\text{C}$.
- c. Cool down the stop cock at ambient temperature ($20 \pm 5^\circ\text{C}$) and reduce the pressure to ambient pressure.
- d. Rinse the stop cock with water.
- e. Close the stop cock completely and measure the maximum required torque.

5.6 Test for resistance to forces and moments

5.6.1 Operating mechanism

5.6.1.1 Apparatus

To test the resistance of the operating mechanism to forces and moments, the stop- or connecting cock shall be installed in a test apparatus in which the required moment can be obtained on the mechanism.

5.6.1.2 Test piece

For the test, a cock is required in which the flexible seal is replaced by a brass one so that the operating mechanism is in effect in the same position as in its normal closed position. If a stuffing box is used for the spindle seal, it should be adjusted as described in 5.2.

5.6.1.3 Method

- a. Close the stop- or connecting cock.
- b. Apply a clockwise moment to the operating mechanism perpendicular to the spindle for a period of 60 s. See Table 4 for the applicable moment.
- c. Open the stop- and connection cock fully.
- d. Apply an anticlockwise moment to the operating mechanism perpendicular to the spindle for a period of 60s. See Table 4 for the applicable moment.

Table 4 - Test moments

DN	moment (in N m)		
	closure	opening	on the end joints
connecting cocks	5	5	50
10	5	5	50
15	10	10	70
20	15	10	100
25	20	10	150
32	25	10	200
40	30	10	350
50	35	10	600

5.6.2 End joints

5.6.2.1 Apparatus

To test the resistance of the end joints to forces and moments, the stop- or connecting cock shall be installed in a test apparatus in which the required moment to be obtained on the relevant components.

5.6.2.2 Test piece

For this test, a stop- or connecting cock is required in which the end joints are fitted, if necessary, with auxiliary fittings to enable the required moments to be obtained on the relevant components.

Remark

For threaded end joints without wrench flats, an auxiliary fitting consisting of a thread with wrench flats shall be used. End joints with a bore hole for capillary soldering can, if necessary, be fitted with cylindrical auxiliary fittings to simplify installation in the test apparatus.

5.6.2.3 Method

- a. Connect one end of the test piece to the test apparatus, using an auxiliary fitting if necessary.
- b. Apply a moment to the open end for a period of 60 seconds in the same plane as the centre line of the end joints. See Table 4 for the applicable moment.
- c. Apply a moment to threaded end joints in a plane at right angles to the centre line of the end joint. See Table 4 for the applicable moment.

5.7 Durability test

5.7.1 Apparatus

To test the durability of the stop- or connecting cock, the sample shall be installed in a test rig in which it can be submitted to a continuous test process.

5.7.2 Test piece

The durability test shall be performed on a sample that has not been submitted to other tests.

If a stuffing box is used as a spindle seal, this shall be adjusted as described in section 5.2.

If the spindle seal of this type of stop cock leaks during the durability test, the gland shall be tightened to the point at which a seal is obtained at a water pressure in the stop cock of 400 kPa.

5.7.3 Test procedure

5.7.3.1 Test conditions

During the durability test of the stop- or connecting cock:

- the water shall flow in the direction as indicated on the cock (if applicable);
- the water temperature shall not exceed 30°C;
- with the stop- or connecting cock fully open, the flow rate shall be at least 0.08 l/s;
- the static pressure on the closed stop- or connecting cock shall not exceed 400 kPa.

5.7.3.2 Method

Carry out 10.000 consecutive cycles. Each cycle shall consist of the following actions:

- a. open the stop- or connecting cock with a rotation frequency of 0.5 Hz until it is 80% open;
- b. maintain this position for 5 seconds;
- c. close the the stop- or connection cock with a rotation frequency of 0.5 Hz;
- d. apply for a period of 5 seconds a moment of 3 Nm for stop cocks up to DN 25, respectively 5 Nm for stop cocks larger then DN 25 and 1 N m for connecting cocks;
- e. maintain this position for 5 seconds.

Carry out 5.000 consecutive cycles on the same test sample according to (a) up to and including (e), with a water temperature of $65 \pm 3^\circ\text{C}$.

6 Coding

Stop- and connecting cocks manufactured according to these requirements are indicated with a code, consisting of the name, the nominal diameter, the connection of the inlet side, respectively the outlet side and the eventual presence of drainage connections.

The following symbols are used:

- A end joint with internal threads;
- B end joint with external threads;
- C end joint with capillary solder;
- F end joint with flange;
- KF end joint with compression joint;
- IF end joint with push-in joint;
- WM end joint with (secured) union nut;
- S body with drainage connections.

Example for coding of a straight stop cock with disc with a nominal diameter of DN 15, an internal thread on the inlet side (A), a union nut on the outlet side (WM) and with drainage connections on the body (S) would have the following code:

Straight stopcock with disc - **DN 15 - A - WM - S.**

7 Marking

7.1 General

The marking requirements for stop cocks with valve or ball are in accordance with the standards:

EN 1213 Building valves - Copper alloy stop valves for potable water supply in buildings - Tests and requirements.


EN 13828 Building valves - manual operated ball valves of copper alloys and stainless steel for potable water supply in buildings - test procedures and requirements.

Ball valves furnished with drainage connections shall also be marked with a flow direction indicator.

Other stop- and connecting cocks shall be marked clearly visible and undelible with the following:

- On the housing:
 - Flowdirection (applicable to stop- and connection cocks with drainage connections);
 - Nominal diameter;
 - Company trademark.
- On the head part (if applicable)
 - Company trademark.
- On the union of the compression joint (if applicable)
 - Company trademark;
 - Nominal diameter.

7.2 Certification mark

After conclusion of the Kiwa certification agreement, in addition to the marks indicated in the mark **KIWA**  shall be applied legible and indelible.

8 Requirements in respect of the quality system

This chapter contains the requirements which have to be met by the supplier's quality system.

8.1 Manager of the quality system

Within the supplier's organizational structure an employee must have been appointed who is in charge of managing the supplier's quality system.

8.2 Internal quality control/quality plan

The supplier shall have an internal quality control scheme (IQC scheme) which is applied by him.

The following must have been demonstrably recorded in this IQC scheme:

- what aspects are checked by the producer;
- according to what methods such inspections are carried out;
- how often these inspections are carried out;
- in what way the inspection results are recorded and kept.

This IQC scheme should at least be an equivalent derivative of the model IQC scheme included in the addendum.

8.3 Procedures and working instructions

The supplier shall be able to submit the following:

- procedures for:
 - dealing with products showing deviations;
 - corrective actions to be taken if non-conformities are found;
 - dealing with complaints about products and/or services delivered;
- the working instructions and inspection forms used.

9 Summary of tests and inspections

This chapter contains a summary of the following tests and inspections to be carried out in the event of certification:

- Pre-certification tests;
- Inspection test as to toxicological requirements and product requirements;
- Inspection of the quality system.

The frequency with which Kiwa will carry out inspection tests is also stated in the summary.

9.1 Test matrix

Description of requirement	Article BRL	Tests within the scope of		
		Pre-certification	Supervision by Kiwa after granting of certificate ¹⁾ inspection ²⁾	frequency (no./year)
Materials				
Toxicological requirements	4.2.1	X	X	2
Chemical and functional requirements		X	X	1
Construction and design				
seals	4.3	X	X	1
operation	4.4	X	X	1
dimensions	4.5/4.6	X	X	1
construction	4.7			
• body wall thickness		X	X	1
• wrench flats		X	X	1
• direction of flow		X		
• drainage connections		X		
• appearance and finish		X	X	2
• fastening of the sealing element		X	X	1
Functional aspects				
stopcock with disc	4.9			
• resistance against rotation torque		X	X	1
• resistance against bending moment		X	X	1
• leaktightness		X	X	2
• pressure resistance		X	X	2
• flow capacity		X		
• acoustic properties		X		
• endurance test		X		
stopcock with ball	4.10			
• operating torque		X	X	1
• strength of shoulders		X	X	1/3
• resistance against forces and moments		X	X	1/3

Description of requirement	Article BRL	Tests within the scope of		
		Pre-certification	Supervision by Kiwa after granting of certificate ¹⁾	frequency (no./year)
<ul style="list-style-type: none"> • leaktightness • pressure resistance • endurance test 	4.11	X	X	2
Other stop- and connecting cocks				
<ul style="list-style-type: none"> • flowcapacity • resistance to high volumes of flow • closure and watertightness • jamming of operating mechanism • resistance to forces and moments • durability 		X	X	2
		X	X	1
		X	X	1
		X		
		X		
		X		
Mark				
<ul style="list-style-type: none"> • general • certification mark 	7.1	X	X	2
	7.2	X	X	2

1) In case of significant changes of the product or production process, compliance of the product to the performance requirements shall be determined.

2) The indicated inspections shall be carried out by the manufacturer, eventually in presence of the inspector.

9.2 Inspection of the quality system

The quality system will be checked by Kiwa on the basis of the IQC scheme.

The inspection contains at least those aspects mentioned in the Kiwa Regulations for Product certification.

10 Agreements on the implementation of certification

10.1 General

Beside the requirements included in these evaluation guidelines, also the general rules for certification as included in the Kiwa Regulations for Product Certification apply.

These rules are in particular

- The general rules for conducting the pre-certification tests, to be distinguished in:
- the way suppliers are to be informed about an application is being handled,
- how the test are conducted,
- the decision to be taken as a result of the pre certification tests.
- The general directions for conducting inspections and the aspects to be audited,
- The measurements to be taken by Kiwa in case of Non Conformities,
- Measurements taken by Kiwa in case of improper Use of Certificates, Certification Marks, Pictograms and Logos,
- Terms for termination of the certificate,
- The possibility to lodge an appeal against decisions of measurements taken by Kiwa.

10.2 Certification staff

The staff involved in the certification may be sub-divided into:

- certification experts: they are in charge of carrying out the pre-certification tests and assessing the inspectors' reports;
- inspectors: they are in charge of carrying out external inspections at the supplier's works;
- decision-makers: they are in charge of taking decisions in connection with the pre-certification tests carried out, continuing the certification in connection with the inspections carried out and taking decisions on the need to take corrective actions.

10.2.1 Qualification requirements

The following qualification requirements have been set by the Board of Experts for the subject matter of this Evaluation Guideline:

EN45011	Certification Expert	Inspector	Decision maker
Education - general	<ul style="list-style-type: none"> • Technical higher-level professional education • Internal training certification and Kiwa policy • Training auditing 	<ul style="list-style-type: none"> • Intermediate-level professional education • Internal training certification and Kiwa policy • Training auditing 	<ul style="list-style-type: none"> • Higher level professional education • Internal training certification and Kiwa policy • Training auditing
Education - specific	<ul style="list-style-type: none"> • for BRL relevant technical education • specific studies and training (know-how and skills) 	<ul style="list-style-type: none"> • for BRL relevant technical education • specific studies and training (know-how and skills) 	<ul style="list-style-type: none"> • not applicable unless the CvD has specific requirements
Experience - general	<ul style="list-style-type: none"> • 1 year of relevant work experience with at least 4 pre certification tests of which one carried out independent under supervision. 	<ul style="list-style-type: none"> • 1 year of relevant work experience with at least 4 inspections of which one carried out independent under supervision 	<ul style="list-style-type: none"> • 4 year of relevant work experience with at least 1 year in certification

EN45011	Certification Expert	Inspector	Decision maker
Experience - specific	<ul style="list-style-type: none"> Detailed knowledge of the BRL and 4 certification tests carried out on the basis of the BRL or one related. 	<ul style="list-style-type: none"> Detailed knowledge of the BRL and 4 inspections carried out on the basis of the BRL or one related. 	<ul style="list-style-type: none"> general knowledge of the BRL

The level of education and the experience of the certification staff involved should be demonstrably recorded.

10.2.2 Qualification

The qualification of the Certification staff shall be demonstrated by means of assessing the education and experience to the requirements mentioned before. In case staff is to be qualified on the basis of deflecting criteria, written records shall be kept.

The authority to qualify staff is dedicated to:

- decision makers: qualification of certification experts and inspectors,
- Management of Kiwa: qualification of decision makers.

10.3 Report Pre certification tests

Kiwa records the results of the pre certification tests in a report. This report shall comply with the following requirements:

- completeness: the reports verdicts about all requirements included in the evaluation guideline,
- traceability: the findings on which the verdicts have been based shall be recorded traceable,
- basis for decision: the decision maker shall be able to base his decision on the findings included in the report.

10.4 Decision for granting the certificate

The decision for granting the certificate shall be made by a qualified decision maker which has not been involved in the pre certification tests. The decision shall be recorded traceable.

10.5 Lay out of quality declaration

The product certificate shall be conform the model included as an annex

10.6 Nature and frequency of external inspections

The certification body shall carry out Audits at the supplier at regular intervals to check whether the supplier complies with his obligations. About the frequency of inspections the Board of Experts decides. At the time this Evaluation Guideline took effect, the frequency was set at the number of two inspection visits per year.

Inspections shall at least refer to:

- The suppliers IQC-scheme and the results obtained from inspections carried out by the supplier,
- The correct way of marking of certified products
- Complying with required procedures.

The results of each inspection shall be traceable recorded in a report.

10.7 Interpretation of requirements

The Board of Experts may record the interpretation of requirements of these evaluation guidelines in one separate interpretation document.

11 Titles of standards

Titles of the Standards and Publications as mentioned and to be consulted:

Number	Title
BRL-K622	Flexible connection hoses
BRL-K623	Fittings, couplings and parts for solder and screw joints with copper pipes
BRL-K640	Compression, press and push fittings
BRL 2013	Rubber rings and flange gaskets for connections in potable water- and wast water conduit pipes
DIN 17440	Nichtrostende Stähle. Technische Lieferbedingungen für Blech, warmband und gewalzte Stäbe für Druckbehälter, gezogen Draht und Schmiedstücke
DIN 2501 Teil 1	Flangesche, Connection sizes Anschlussmasse.
DIN 7737	Schichtpressstoff-Erzeugnisse; Vulkanfiber, Typen
ISO 228-1	Pipe threads where pressure tight joints are not made on the threads - Part 1: Dimensions, tolerances and designations
ISO 7-1	Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designations
NEN 1006:2002	General regulations drinkingwater installations
NEN 927:1963	Pressure gauges. Examining and calibrating
NEN-EN 248:2002	Sanitary tapware – General specification for electroplated coatings of Ni-Cr
NEN-EN 10088.3:1995	Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes
NEN-EN 1213:1999	Building valves – Copper alloy stop valves for potable water supply in buildings – Tests and requirements
NEN-EN 13828	Building valves - Manual operated ball valves of copper alloys and stainless steel for potable water supply in buildings - test procedures and requirements

Waterwerkblad Drinkwaterinstallaties WB 2.2 A

Kiwa-Regulations for Productcertification

In this BRL is referred to the version in force, unless something else is mentioned.

I Model certificate

Product certificate
KXXXXXXX/OX



Issued

Replaces

Page 1 of 2

Stop- and connecting cocks

Certificate

STATEMENT BY KIWA

With this product certificate, issued in accordance with the Kiwa Regulations for Product Certification, Kiwa declares that legitimate confidence exists that the products supplied by

Name supplier

complying with the technical specifications as laid down in this product certificate and marked with the Kiwa®-mark in the manner as indicated in this product certificate, on delivery, may be relied upon to comply with Kiwa evaluation guideline BRL-K604/06 "Stop- and connecting cocks".

Bouke Meekma
Kiwa

Publication of the certificate is allowed.

Advice: consult www.kiwa.nl in order to ensure that this certificate is still valid.

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Supplier

Certification process
consists of initial and
regular inspection of:

- quality system
- product

II Model IQC-scheme

Inspection subjects	Inspection aspects	Inspection method	Inspection frequency	registration
Receiving inspection <ul style="list-style-type: none"> raw materials 	material			
Process control <ul style="list-style-type: none"> hot pressing process hot pressing products machining of parts assembly 	temperature <ul style="list-style-type: none"> appearance non filled parts weld lines dimensions dimensions fit threads correct parts correct location lubrication 			
Product control <ul style="list-style-type: none"> appearance marking functional properties 	finishing correctness			
Measuring and testing equipment <ul style="list-style-type: none"> test equipment calibration 				
Logistics <ul style="list-style-type: none"> Internal transport Storage Packaging Preservation Identification or marking of semi-manufactures and end-products 				