

BRL K14004/01
2002-04-19

Evaluation guideline

*for the Kiwa product certification for
water reducing valves and combination water
pressure reducing valves*



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Validation

This evaluation guideline^{*)} has been validated by the Director Certification and Inspection of Kiwa from August 16th, 2002

^{*)} Translated from the Dutch. The Dutch text is only legally binding

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Preface

Kiwa's Board of Experts CKW, in which the parties interested are represented, has prepared this Evaluation Guideline. This Board of Experts also guides the performance of certification and adjusts this Evaluation Guideline where necessary. Wherever the term 'Board of Experts' is used in this Evaluation Guideline, the above-mentioned Board of Experts is meant.

This Evaluation Guideline will be used by Kiwa in conjunction with the Kiwa Regulations for Product Certification, in which the general rules used by Kiwa in the event of certification are recorded.

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1 Introduction

1.1 Subject

The requirements included in this Evaluation Guideline are used by Kiwa when handling an application, and maintaining a product certificate for water reducing valves and combination water pressure reducing valves.

In the performance of its certification work Kiwa is bound by the requirements set out in the Chapter entitled 'Agreements on the performance of certification'.

1.2 Scope

This evaluation guideline specifies the requirements for water reducing valves and combination water pressure reducing valves of nominal size DN 8 to DN 100 for inlet pressures that not exceed 1.600 kPa and a temperature that does not exceed 30°C for cold water application and 80°C for hot water application. Except when stated otherwise by the manufacturer the valves can be applied for both temperature applications.

1.3 General

If the supplier submits reports from research bodies or laboratories to show that the requirements of the Evaluation Guideline are met, it will have to be shown that such reports were prepared by a body meeting the prevailing accreditation standard, i.e.

- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN 45004 for inspection bodies;
- NEN-EN 45011 for certification bodies certifying products;
- NEN-EN 45012 for certification bodies certifying systems;
- NEN-EN 45013 for certification bodies certifying persons.

The body is deemed to meet these criteria if an accreditation certificate can be submitted which has been issued by Raad voor Accreditatie (Board of Accreditation) or an accreditation body with which Raad voor Accreditatie has concluded a mutual acceptance agreement. This accreditation should relate to the tests required for this Evaluation Guideline.

If no accreditation certificate can be submitted, Kiwa itself shall verify whether the accreditation standard has been met or carry out the tests concerned itself, or have same carried out.

1.4 Quality certificate

Any quality certificate issued on the basis of this Evaluation Guideline is referred to as a 'Kiwa product certificate'.

The model of this quality certificate has been included in this Evaluation Guideline as an addendum.

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 "CKW".

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.

Pressure: the effective pressure (p_e). The difference between the absolute pressure (p) and the surrounding pressure (p_{amb}). Expressed as a formula: $p_e = p - p_{amb}$

Working pressure: the highest pressure occurring in the drinking water appliance or in the parts of it, under normal circumstances.

Tap water installation: installation existing of pipelines, fittings, water treating and other equipment used to extract or to distribute tap water. With a tap water installation a collective water supply, collective pipelines and/or a home installation is meant.

Remark

- Tap water can be drinking water, warm water or water of other surfaces.

Nominal diameter (DN): a numerical indication of the bore which is generally used for all components in a pipeline system, excluding those which are indicated in terms of the external diameter or the size of the thread.

This is a simple whole number, which is only used as an indicator and only loosely correlates with the manufacturer's specifications.

Remarks

1. Components are indicated with DN followed by a number.
2. The nominal diameter is not the actual measured diameter and should not be used for calculations.

3 Requirements

3.1 General

This chapter contains the requirements the thermostatic regulating valves have to comply with. These requirements will make part of the technical specification of the products, as included in the certificate.

3.2 Product requirements and examination methods.

De product requirements and examinations methods to the water reducing valves and combination water pressure reducing valves are stated in:

NEN-EN 1567: "Water reducing valves and combination water pressure reducing valves"

3.3 Additional requirements materials.

In addition to the introduction in NEN-EN 1567 the following requirements applies to the materials.

3.3.1 Toxicological requirements

3.3.1.1 Toxicity

Materials, which come in contact with drinking water, may not give off substances to the drinking water in concentrations, which can be detrimental to the health of the consumers of this water. To that, the materials have to comply with the criteria as laid down in the "Guideline quality of materials and chemicals for drinking water supplies"¹ and shall the application procedure for the Assessment of Toxicological Aspects be finished with positive results. This application procedure is included as appendix to this evaluation guideline.

3.3.1.2 Colour, smell and taste

In tests according to article 4.1, after the third migration period, the colour given off by the thermostatic mixing valve to the migration water may not exceed that of the original migration water by more than 5 mg/l (scale Pt/Co).

When testing the migration water according to article 4.1.3 for smell and taste given off by the thermostatic mixing valve, with a dilution of one part to fifteen (16 times), no deviating smell or taste may be detected by at least five out of the eight members of the panel according to article 4.1.3.

3.3.2 Plastics and rubber

3.3.2.1 Basic materials

The manufacturer of the water reducing valves and combination water pressure reducing valves shall inform the testing institute about the origin and the types of plastics and rubbers. It is preferred that applied plastics can be recycled.

3.3.2.2 Changes basic materials

The manufacturer is allowed to change only the origin and the types of plastics and rubbers after written approval of the testing institute.

¹ In the publication of the "Staatstoezicht op de Volksgezondheid" (the Dutch Inspectorate of Public Health and Environmental Protection) entitled "Guideline quality of materials and chemicals for drinking water supplies" the Chief Inspectorate of Public Health and Environmental Protection has laid down the system for evaluation on health aspects. This guideline also includes so-called positive lists for a certain amount of materials. These lists specify those compounds and raw materials of which the Chief Inspectorate of Public Health and Environmental Protection considers the presence in these products or the use during the manufacture of these products, acceptable under certain conditions. Materials and products that do not (completely) consist of ingredients of a positive list are assessed by the Chief Inspector in each individual case.

3.3.2.3 Expectation of life

The expectation of life of plastic materials, used for water containing parts, shall be at least 25 years in the field of use of the cartridge. This shall be proved by the supplier of the material.

3.3.3 Chemical and mechanical requirements

3.3.3.1 Copper alloys

Copper alloys shall be, as preferred, in compliance with EN 1567, clause 6.2.1 and 6.2.2.

3.3.3.2 Corrosion resistant steel

Corrosion resistant steel shall be in accordance with EN 10088 -1

- X 2 CrNiMo 17 13 3 (AISI 316 L);
- X 6 CrNiMoTi 17 12 2 (AISI 316 Ti).

3.3.3.3 Zinc-aluminium alloys

Zinc-aluminium alloys are only to be used for controls and are to be coated with an anti corrosive protection layer

3.3.3.4 Rubber

Rubber shall comply with the requirements of BRL-K2013 in respect of the influence on drinking water and the physical and mechanical aspects².

For sealing elements such discs or membranes, made of rubber, the BRL-K2013 does not apply.

Natural rubber (NR) and isoprene rubber (IR) are not allowed.

3.3.3.5 Fibre

Applied fibre shall be in compliance with DIN 7737 and minimal meet the specifications to:

- Type VF 3110
- Type VF 3111

3.3.3.6 Plastic coatings

The thickness of the layer, as applied on control handles, shall be at least 25µm.

After a test according to article 4.2 the coating shall meet;

- EN 248, article 7.1.1. in relation to the corrosion resistance;
- ISO 2409, table 1, class 0 or 1 for the adhesion.

3.3.4 Other materials

Materials other than those mentioned here may be used on the following conditions:

- it shall be of comparable quality³;
- it shall not generate electrochemical corrosion (contact corrosion);
- it shall be resistant against prolonged action of drinking water having a temperature of 90°C;
- they must comply with the requirements laid down in article 3.3.1.

² The rubber is considered to comply with the mechanical requirements of BRL-K2013 if the functional examinations as included in this evaluation guideline have been finished with positive results.

³ Materials are considered to comply with this requirement if they finish the functional examination with positive results.

4 Test methods

4.1 Determination of release of colour, smell and taste

4.1.1 Test equipment, materials, auxiliary fittings and conditions

To enable the release of colour, smell and taste to be tested, the regulating valve shall be installed in a drinking water system in which the flow of the water can be controlled by the regulating valve.

The water used in the test shall be clean and unchlorinated, and shall be first pass through a carbon filter at a rate of 15 ± 5 ml/min. The carbon filter should consist of a glass cylinder with an internal diameter of approx. 80 cm and filled with 2.5 litres of carbon (to a height of approx. 50 cm). The carbon should be Norit type RBX No.1 or a comparable type.

Glasses should release no smell or taste and should be cleaned with odourless soap. 24 hours before the taste test, they should be filled with tasteless water to which 10 ml of 30% hydrogen peroxide per 250 ml has been added.

Panel members shall not eat, drink or smoke within one hour of the start of the taste test and must avoid substances that may effect their senses of smell and taste.

The taste test shall be carried out in an area that is free of disturbing odours and sounds, where the temperature is a steady $20 \pm 2^\circ\text{C}$ and the relative humidity is at least 50%.

The correct equipment shall be used to allow the test to be carried out according to NEN-EN-ISO 7887.

4.1.2 Test piece

One or more water regulating valves should be used so that the total volume of diaphragms or valve coverings is at least 50 ml.

4.1.3 Method

- a. Rinse the regulating valve with drinking water at a rate of 2 m/s for 300 seconds and adjusted to suit the internal bore of the end joint;
- b. Immediately after this, rinse the regulating valve with test water;
- c. Dismantle the regulating valve and place the diaphragms or the valve coverings in a measuring cylinder;
- d. Fill the measuring cylinder with test water to 10 times the volume of the diaphragms or valve coverings, and take a sample of the test water as a control;
- e. Seal the measuring cylinder so that it is airtight;
- f. Store the measuring cylinder for 72 ± 1 hours at a temperature of $20 \pm 2^\circ\text{C}$;
- g. Take a sample of the water from the measuring cylinder;
- h. Rinse the measuring cylinder and plastic parts with test water;
- i. Repeat sections d. to h. twice (a total of 3 migration periods);
- j. Analyse the colour of the sample from the third period according to NEN-EN-ISO 7887;
- k. Use the control sample to make a 16-fold dilution of the remaining test water from the third period;
- l. Let at least 8 members of the panel test the smell and taste of samples of the dilution and samples of the control water.

4.2 Determination of the adherence and the durability of plastic coatings

4.2.1 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 NEN-EN-ISO 2409.

4.2.2 Test piece

A number of regulating valves that the surface to be tested is at least 10 000 mm².

4.2.3 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 $20 \pm 10^{\circ}\text{C}$.

4.2.4 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-EN-ISO 2409;
- d. Of the remaining test pieces it is to be determined whether they comply with EN 248.

5 Marking

5.1 General

In addition to EN 1567, clause 9.1 the products shall be marked indelible and visible after installation to the water reducing valves and combination water pressure reducing valves:

- “30” or “80” indicating the maximum temperature of application;
- acoustic class, if compliance with the acoustic requirements is required.

5.2 Certification mark

After concluding a Kiwa certification agreement the body of the products shall be indelible marked with the word mark “KIWA”.

6 Requirements in respect of the quality system

6.1 General

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

6.2 Manager of the quality system

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

6.3 Internal quality control/quality plan

The supplier must 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.

6.4 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.

7 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.

7.1 Test matrix

Description of requirement	Article BRL	Tests within the scope of		
		Pre-certification	Supervision by Kiwa after granting of certificate inspection	frequency (no./year)
Material				
Toxicological requirements	3.3.1.1	X		
Colour, smell and taste	3.3.1.2	X		
Chemical and functional requirements	3.3.3	X	X	2
Production aspects				
Description of requirement	Article EN 1567	Pre-certification	Supervision by Kiwa after granting of certificate inspection	frequency (no./year)
Design	7.1	X	X	1
Functional aspects				
• Bending moment test of the body	8.2.1	X	X	1
• Pressure strength and tightness of the body	8.2.2	X	X	2
• Tightness between inlet and outlet chamber	8.2.3	X	X	2
Endurance test	8.2.4	X		
Hydraulic requirements				
• Set point	8.3.1 8.3.2	X	X	1
• Inlet pressure influence	8.3.3	X	X	1
• Flow rate	8.3.5	X	X	2
• Acoustic requirements	8.4			
Marking, technical documentation and certification mark.	9	X		

8 Agreements on the implementation of certification

8.1 General

This chapter contains the agreements made within the Board of Experts on the implementation of the certification by Kiwa.

8.2 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.

8.2.1 Qualification requirements

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

Certification staff	Level of education	Experience
Certification expert	Higher-level professional education (<i>HBO</i>) in one of the following disciplines: <ul style="list-style-type: none"> • Mechanical Engineering • Technical Business administration • Chemical Engineering • Process Engineering 	3 years
Inspector	Intermediate-level professional education (<i>MBO</i>) in one of the following disciplines: <ul style="list-style-type: none"> • Mechanical Engineering 	3 years
Decision-maker	Higher-level professional education (<i>HBO</i>) in one of the following disciplines: <ul style="list-style-type: none"> • Mechanical Engineering • Technical Business administration • Chemical Engineering • Process Engineering 	5 years Management experience

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

8.3 Frequency of external inspections

At the time this Evaluation Guideline took effect, the frequency was set at number of 2 of inspection visits per year.

9 Titles of standards

9.1 Standards / standard documents:

Number	Title
BRL 2013	Vulcanised rubber pipe joint seals for potable water and waste water
DIN 17660	Kupfer-Knetlegierungen; Kupfer-zink-legierungen (messing) (sondermessing) zusammensetzung
DIN 7737	Sichtpresstoff- erzeugnisse; Vulkanfiber; Typen
NEN-EN-ISO 228-1	Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designations
NEN-EN 248	Sanitary tap ware – General specification for electrodeposited coatings of Ni-Cr
EN 45001	General Criteria for the operation of testing laboratories
EN 45004	General Criteria for the operation of various types performing inspection.
EN 45011	General Criteria for bodies operating product certification systems
Euronorm 88-71	Stainless steels, quality requirements
ISO 426/1	Wrought copper-zinc alloys – chemical composition and forms of wrought products – Part 1: non-lead and special Copper-zinc alloys
ISO 426/2	Wrought copper-zinc alloys – chemical composition and forms of wrought products – Part 2: leaded copper-zinc alloys
ISO 431-1981	Copper refinery shapes
ISO 1338-1977	Cast copper alloys
ISO 2409	Paints and varnishes; Cross-cut test
NEN-EN 1567	Water reducing valves and combination water pressure reducing valves
NEN-EN-ISO 7887	Water quality; Examination and determination of colour
NEN 5337	Cross cut test

appendix 1 Certificate Number 12345

Replaces

Issued

Dated

Product certificate

Water pressure reducing valves

Based on pre-certification tests as well as periodic inspections by Kiwa the products referred to in this certificate and marked with the Kiwa-mark as indicated under "Marking", supplied by

Supplier

May, on delivery, be relied upon to comply with the Kiwa evaluation guideline BRL-K14004 "Water reducing valves and combination water pressure reducing valves".

Kiwa N.V.

ing. B. Meekma
Director
Certification and Inspection

This certificate is issued in accordance with the Kiwa-regulations for Product Certification and consists X pages.

Supplier

appendix 2 Model IQC-scheme

Inspection subjects	Inspection aspects	Inspection method	Inspection frequency	registration
Receiving inspection <ul style="list-style-type: none"> • raw materials • fastening material • packing material • semi manufactures 	<ul style="list-style-type: none"> • material • dimensions • material • dimensions • material • dimensions • material • dimensions 			
Process control <ul style="list-style-type: none"> • casting process (if applicable) • cast products • hot pressing process • hot pressing products • machining of parts • assembly 	<ul style="list-style-type: none"> • material composition • temperature • appearance • non filled parts • weld lines temperature • appearance • non filled parts • weld lines • dimensions • fit • threads • correct parts on correct location • lubrication 			
End product control <ul style="list-style-type: none"> • appearance • marking • functional properties 	Finishing (smooth/sound) Correctness (performance and place) <ul style="list-style-type: none"> • temperature adjustment • water tightness • flow rate 			
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 				