



BRL K536-L
27-02-2026

Evaluation Guideline

for the Kiwa (technical approval-with-)product certificate for plastics piping systems with metal inner layer intended for transport of hot and cold drinking water inside buildings

kiwa

Preface Kiwa

This Evaluation Guideline (BRL) has been accepted by the Kiwa Board of Experts Water Cycle (CWK), in which all relevant parties in the field of 'products in contact with drinking water' are represented. This Board of Experts also supervises the certification activities and will adjust this BRL if required. 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 Certification and BRL K14100 'General requirements for products in contact with drinking and hot tapwater', which includes Kiwa's general rules for certification.

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Binding declaration

This Evaluation Guideline has been declared binding by Kiwa effective 27-02-2026

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1 Introduction

1.1 General

The requirements included in this BRL are used by Kiwa when processing an application and maintaining a (technical approval-with-)product certificate for plastics piping systems with metal inner layer intended for transport of hot and cold drinking water inside buildings.

In addition to §1.1 of BRL K14100:

Where BRL K14100 refers to the 'applicable' BRL, this means BRL K 536-L.

1.2 Field of application / scope

The plastics pipes with metal inner layer and fittings according to this BRL are intended to be applied in piping systems for hot and cold water distribution at a design pressure (= maximum operating pressure) of 8 or 10 bar (9 or 11 bar absolute or 8 or 10 bar overpressure), under the conditions mentioned in table 1.

Remark:

Each pressure mentioned in this evaluation guideline is defined as overpressure.
(So, with "10 bar" a "10 bar overpressure" is meant).

Table 1 – Temperature profile during 50 years

| | Temperature [°C] | Lifetime | Overall service coefficient |
|---|-------------------|-----------|-----------------------------|
| T _{operation} | 70 | 49 years | 1,5 |
| T _{max} | 80 | 1 year | 1,3 |
| T _{malfunction} | 95 | 100 hours | 1,0 |
| Remark: the mentioned temperature profile is in accordance with class 2 of ISO 10508. | | | |

1.3 Acceptance of the test reports provided by the supplier

No additions and/or deviations from §1.3 of BRL K14100.

1.4 Quality declaration

The quality declarations to be issued by Kiwa based on this evaluation guideline will be referred to as Kiwa (technical approval-with-)product certificate.

A model certificate is included in Annex I.

2 Terminology

2.1 Definitions

In additions to BRL K14100 §2.1 and EN-ISO 21003 parts 1, 2, 3, 5 and CEN/TS 21003 part 7, the following terms and definitions apply:

- **Certification mark:** a protected trademark of which the authorization of the use is granted by Kiwa to the supplier whose products can be considered to comply on delivery with the applicable requirements.
If applicable a specially for this purpose designed label on the quality information about the application of this product may be added, based on the results as stated in the report issued by Kiwa on the inspection of the prototype;
- **Follow-up investigation:** the investigation carried out after granting the certificate to determine that the certified products continue to be in compliance with the requirements laid down in the evaluation guideline;
- **Drinking water installation:** an installation that is indirectly or directly connected to the distribution network of a drinking water company (source Dutch Drinking Water Act);
- **Reworked material:** material from rejected unused products or trimmings that have been manufactured and retained within plants owned and operated by the same legal entity;
- **Recyclate:** material resulting from the recycling of pre-consumer (unused products, excluding reworked (plastic) material) and post-consumer (from used products, that have fulfilled their intended purpose or that can no longer be used) products.

2.2 Symbols and abbreviated terms

The symbols and abbreviated terms according EN-ISO 21003, parts 1, 2, 3, 5 and CEN/TS 21003 part 7 do apply.

3 Procedure for obtaining the quality declaration

No additions and/or deviations from chapter 3 of BRL K14100.

4 Requirements and test methods for the piping system

4.1 General

This chapter contains the requirements that the piping system shall meet, as well as the determination methods to determine that the requirements are met.

The certificate holder shall ensure a clear description of all relevant design data, including:

- production process / realization process.
- constituent raw materials, materials and products
- recipe

Any proposed change in parameters (material, product etc.) as defined in part 7 of ISO 21003 and part 7 of other applicable product standards shall be reported to the certification body. The certification body shall assess whether the change may affect the certified products, which requires reassessment of the product in question in line with the requirements of part 7 of ISO 21003 as well as part 7 of other applicable product standards.

Once it has been established that the products with the proposed change meet the requirements in accordance with chapters 4-8, the change can be implemented in the production process of the certificate holder.

4.2 Materials

The following requirements apply to the raw materials, (semi)finished products and/or materials processed/applied during production:

4.2.1 Hygienic aspects

The products must demonstrably meet the requirements as stated in BRL K14101.

4.2.2 Elastomeric sealing elements

In case rubber sealing elements are present in the joints, the rubber elements shall meet the requirements of Kiwa BRL K17504 class III.

If the rubber sealing element is supplied under a product certificate based on this BRL, the manufacturer may assume that this requirement is met.

4.2.3 Grease and lubricants

Where greases and/or lubricants are used in the making of a joint, these lubricants shall be hygienically assessed (see §4.2.1). If the greases and/or lubricants are certified by Kiwa on the basis of BRL K535, then the supplier may assume that this requirement is fulfilled. In both cases the required joints tests according 4.3.2 shall be carried out with the greases and/or lubricants applied.

4.3 Requirements for the joints of the piping system

4.3.1 General

The joints in the piping system shall be tested with regard to their proper functioning. In this chapter all joint tests required for the joint system are included.

The combination of a (possible) rubber seal, pipe, (possible) supporting insert and compression, press or push construction in the fitting have to be tested with regard to the aspects as mentioned in table 1.

4.3.2 Tightness and strength of the joints

After testing in accordance with table 2, the joint connections between pipe and fittings shall fulfil the requirements according to table 2. If not otherwise stated, the testing temperature is $(23 \pm 2) ^\circ\text{C}$.

Table 2 – Tightness and strength of the pipe joints

| Aspect | Requirement | Test parameters | Test method | |
|---|---|--|-----------------------|---------------------------------------|
| Resistance to thermal cycling | no leakage | 5 000 cycles $T_{\max} = (90 \pm 2) \text{ }^{\circ}\text{C}$ ¹⁾ $T_{\min} = (20 \pm 2) \text{ }^{\circ}\text{C}$ $t_{\text{cyclus}} = 30 \text{ min}$ ²⁾ p_D (bar) Pre stress = MPa ³⁾ One test piece | EN-ISO 19893 | |
| Resistance to pressure cycling | no leakage | Three test pieces 10 000 cycles (30 ± 5) cycles/min Test pressure (bar) | EN-ISO 19892 | |
| | | $p_D = 8 \text{ bar}$ | | $p_D = 10 \text{ bar}$ |
| | | $p_{\max} = 12,0$ $p_{\min} = 0,5$ | | $p_{\max} = 15,0$ $p_{\min} = 0,5$ |
| Resistance to pull-out | No separation of pipe and fitting no scratches or breakage within the distance d (= diameter of the pipe) on the pipe and fitting | $t = (60 \pm 1) \text{ min.}$ Three test pieces $F = 1,5 \times \pi/4 \times d_n^2 \times 1 \text{ (N)} - 23 \text{ }^{\circ}\text{C}$ $F = 1,0 \times \pi/4 \times d_n^2 \times p_D \text{ (in MPa)(N)} - 95 \text{ }^{\circ}\text{C}$ d_n in mm $T = 23 \text{ }^{\circ}\text{C}$ and $95 \text{ }^{\circ}\text{C}$ | EN-ISO 3501 | |
| Leak tightness under vacuum | $\Delta p \leq 0,05 \text{ bar}$ | $t = (60 \pm 1) \text{ min.}$ $T = (23 \pm 2) \text{ }^{\circ}\text{C}$ Three test pieces $p = -0,8 \text{ bar}$ | EN-ISO 13056 | |
| Leak tightness under internal pressure and bending | no leakage | $t = (60 \pm 1) \text{ min.}$ $T = (20 \pm 5) \text{ }^{\circ}\text{C}$ Three test pieces Minimum bending radius ⁴⁾ | EN-ISO 3503 | |
| | | Test pressure ... bar ³⁾ | | |
| Resistance to internal pressure | no leakage | $t = 1\ 000 \text{ h.}$ $T = 95 \text{ }^{\circ}\text{C}$ Minimum of 3 connections | EN-ISO 1167-series | |
| | | Test pressure ... bar ³⁾ | | |
| ¹⁾ T_{\max} till $(95 \pm 2) \text{ }^{\circ}\text{C}$ is allowed ²⁾ $t_{\text{cyclus}} = t_{T_{\max}} + t_{T_{\min}} (= 15_0^{+1} + 15_0^{+1} = 30_0^{+2})$ minutes. Total time = 2 500 hours) ³⁾ Information from manufacturer, determined according to EN ISO 21003-5 ⁴⁾ The minimum bending radius may be declared by the manufacturer. If no declaration is made, $15 \times d$ will be taken as minimum bending radius | | | | |

4.4 Installation instructions

The supplier shall provide instructions with regard to storage, transport and installation conditions of the piping system components. These instructions comprise instructions for making connections, guidance for assembling flanges and installation instructions.

This information shall be recorded in the supplier's quality plan.

5 Product requirements and test methods for the pipes

5.1 General

This chapter contains the requirements that the pipes shall meet, as well as the determination methods to determine that the requirements are met.

5.2 Hygienic Aspects

The products must demonstrably meet the requirements as stated in BRL K14101.

5.3 Materials

5.3.1 General

The material(s) used for each layer of the multilayer pipe shall be specified by the pipe manufacturer.

5.3.2 Metal materials of the inner layer

The material properties of the metal inner layer shall meet the requirements of the relevant reference EN product standards (e.g. EN 10088-1 for stainless steel and EN 1057 for copper).

5.3.3 Thermoplastics materials of the outer layer

The material properties of the outer layer shall meet the requirements of the relevant reference product standards as set out in table 3 or any other material according to their reference product standard covering class 2 application as described in this BRL. The relevant physical properties shall be checked in accordance with the relevant section of the relevant reference product standard.

Table 3 – Reference product standards

| Material | Reference product standards |
|--|--|
| PB | EN-ISO 15876 (part 1 and 2) |
| PE-RT | EN-ISO 22391 (part 1 and 2) |
| PE-X | EN-ISO 15875 (part 1 and 2) ^a |
| PP | EN-ISO 15874 (part 1 and 2) |
| PVC-C | EN-ISO 15877 (part 1 and 2) |
| ^a The PE-X used shall be fully cross-linked and meet the requirements of the respective reference product standard. | |

5.3.4 Peak melting temperature of the adhesive

When determined according to EN ISO 11357-3, the minimum peak melting temperature $T_{p,c}$ of the adhesive shall be > 120 °C.

5.3.5 Thermal stability of the adhesive

When determined according to ISO 2578 and the methodology of annex D of EN-ISO 21003, part 2, the temperature index (thermal stability) of the adhesive shall be > 70 °C.

5.3.6 Reworked and recyclate materials

The use of reworked material is allowed. The use of recyclate material is not allowed.

5.4 Surface conditions

When inspected visually, the inside and outside of the pipes shall be smooth without any flaws. The weld seam shall be regular without visible damage(s).

5.5 Geometrical characteristics

The dimensions of the pipes (in mm) shall be specified by the pipe manufacturer, which includes:

- Mean outside diameter: d_{em} (mm)
- Tolerance on the outside diameter (mm)
- Mean inside diameter: d_{im} (mm)
- Out-of-roundness: ovality (in mm)
- Minimum wall thickness: e_{min} (mm)
- Tolerance on the total wall thickness (mm)
- Thickness with tolerances of the different layers: e_L (mm)

The dimensions of the pipe (in mm) shall be measured in accordance with EN ISO 3126.

Remark

In the case of dispute the measurements of dimensions shall be made not less than 24 h after manufacturing and after being conditioned for at least 4 h at $(23 + 2)$ °C.

5.6 Mechanical characteristics

5.6.1 Long-term hydrostatic strength

The design pressure strength (p_D) is derived from the long-term pressure strength (p_{LPL}), taking in account application class 2 and the overall service design coefficient given in the relevant product standard of the outer layer material (see annex B of EN ISO 21003-2). The long-term pressure strength (p_{LPL}) of multilayer pipes shall be measured (using procedure II) as defined in ISO 17456. The size groups are applicable as described in ISO 17456 and ISO/TS 21003-7:

- dimension group 1, all nominal dimensions less than or equal to 26 mm;
- dimension group 2, all nominal dimensions greater than 26 mm and less than or equal to 63 mm;
- dimension group 3, all nominal dimensions greater than 63 mm.

5.6.2 Strength of the weld seam of the metal inner layer

When tested in accordance with 5.6.1, the strength of the weld seam of the metal inner layer is regarded as being sufficient.

5.6.2.1 Control Points for the strength of the weld seam and the pressure strength

Table 4 – Control points for pressure testing

| Resistance to internal pressure of the pipe | Testing time (hour) | T (°C) | p (bar) ¹ | ISO 1167 |
|---|---------------------|----------|------------------------|----------|
| | ≥ 22 | 95 | | |
| | ≥ 165 | 95 | | |
| | ≥ 1000 | 95 | | |

¹⁾ Test pressures are derived in accordance with ISO 17456 clause 6.2.5 and in combination with testing according to 5.6.1

5.6.3 Resistance to delamination of the pipe layers

The pipes shall comply to the requirements for the resistance to delamination of the pipe layers (between metal and plastic layer) as specified in table 5. In deviation from the ISO 17454 standard the outer polymer layer shall be peeled off from the metal inner layer. The calibration force (F_{cal}) shall not be taken into account.

Table 5 – Delamination resistance

| Requirement | Conditioning | Test pieces | Test method |
|--|--|-------------|-------------|
| $F_{\text{pull}} \geq 30$ N/cm | Before and after conditioning in accordance with EN-ISO 19893 ^a | 5 | ISO 17454 |
| ^a Using the test parameters of application class 2 (see EN-ISO 21003-5) | | | |

5.6.4 Thermal durability of the outer layer

When tested according to Annex C of EN-ISO 21003-2 and taking the test parameters according to table 6 into account, the tested pipe shall show no visible cracks in the outer layer by the naked eye.

Table 6 – Test conditions for thermal durability of the outer layer

| Test temperature °C | Test environment | Test time h | Number of test pieces |
|------------------------|------------------|----------------|-----------------------|
| 110 | Air | 8760 | 3 |

5.6.5 Marking of the pipes

The products are marked with the Kiwa-mark.

Marking on the pipes

The minimum required marking on the pipes shall be:

- KIWA  or * + Class 2 /8 or 10 bar;
- the manufacturer's name, trade name, system name, logo or certificate number of accompanying technical approval (system)certificate;
- material identification of the build-up of the pipe: i.e. "stainless steel / PE-RT";
- nominal outside diameter and nominal wall thickness of the pipe in mm;
- production code.

Location of the marks: on every pipe at intervals of not more than 2 m.

The realization of the marks is as follows: clear, durable and indelible.

*) For smaller diameters permitted by Kiwa.

6 Product requirements and test methods for the fittings

6.1 General

This chapter contains the requirements that the fittings shall meet, as well as the determination methods to determine that the requirements are met.

6.2 Hygienic Aspects

The products must demonstrably meet the requirements as stated in BRL K14101.

6.3 Material and mechanical requirements for plastics fittings

The plastics fittings shall fulfil the requirements of the pertaining product standards taking into account the specifications mentioned in table 7.

Table 7 – requirements for plastics fittings

| Aspect | Requirement | Test parameter | Test method |
|---|--|--|---|
| Material | According IQC ¹⁾ | According IQC ¹⁾ | According IQC ¹⁾ |
| Hydrostatic stress properties of material | \geq design stress (σ_b) according to the relevant product standard for class 2 ⁵⁾ | Resistance to internal hydraulic pressure ²⁾ - at 20 °C - between 60 and 80 °C - at 95 °C - at 110 °C | ISO 1167-series with the help of ISO 9080 |
| Dimensions | Specification manufacturer | Dimensions | ISO 3126 |
| Rubber | BRL 17504, class III | BRL 17504, class III | BRL 17504 |
| Degree of cross linking (PE-X fittings) | PE-Xa \geq 70% PE-Xb \geq 65% PE-Xc \geq 60% PE-Xd \geq 60% | Degree of cross linking | EN-ISO 10147 |
| Melt flow rate (PP fittings) | \leq 30% difference with respect to granulated material | Mass 2,16 kg Temperature 230 °C | EN-ISO 1133 |
| Melt flow rate (PB fittings) | \leq 30% difference with respect to granulated material | Mass 5 kg Temperature 190 °C | EN-ISO 1133 |
| Resistance to internal pressure | no leakage | $t = 1000$ h $T = 95$ °C Minimum of 3 test pieces | ISO 1167-series |
| | | Test pressure bar ⁴⁾ | |
| Appearance | Smooth without any flaws | Soundness | Visual inspection |

| | | | |
|---|--|--|-----------------|
| Thermal stability ^{3), 5)} | Test time > 8760 hours | Resistance to internal hydraulic pressure ²⁾ at 110 °C Applied stress conform the reference lines or long term strength data | ISO 1167-series |
| Behaviour at heating | Damages around injection point ≤ 30 % of wall thickness No holes, bubbles or cracks | In consultation with manufacturer | EN-ISO 580 |
| <p>¹⁾ IQC: is laid down as part of the certification agreement, after approval of the certification body</p> <p>²⁾ Test pieces are injection moulded and are cylindrical shaped</p> <p>³⁾ Test shall be performed on tubular test pieces which are produced by the fitting manufacturer. Alternatively straight couplers can also be used. In this case, the most critical position (smallest wall thickness) of the base body of the coupler shall be used for the calculation of the hydrostatic hoop stress body.</p> <p>⁴⁾ Information from manufacturer, determined according to EN ISO 21003-5</p> <p>⁵⁾ For PPSU and PVDF ISO 4076 and ISO 4070 respectively do apply</p> | | | |

6.4 Material and mechanical requirements for metal fittings

The metal fittings shall fulfil the requirements of table 8.

Table 8 – requirements for metal fittings

| Aspect | Requirement | Test parameter | Test method |
|--|---|---|--------------------------|
| Material fitting body | Brass: EN 1254-3 EN 1254-6 EN 1254-8 Stainless steel: EN 10088 EN 10283 | IQC ¹⁾ | Information manufacturer |
| Rubber | BRL 17504, class III | BRL 17504, class III | BRL 17504 |
| Dimensions | EN1254-3 EN 1254-6 EN 1254-8 | Minimum thickness | EN-ISO 228-1 or ISO 7-1 |
| Construction | EN1254-3 EN 1254-6 EN 1254-8 | Construction drawings | EN-ISO 3126 |
| Resistance to inner water pressure (strength fitting body) | No cracks | Brass: EN 1254-3 par. 5.1 EN 1254-6 Par. 5.1.4 EN 1254-8 Par.5.1.1 Stainless steel: 25 bar at (23 ± 2) °C during 48 hours ²⁾ | EN-ISO 1167-1 |
| Brass Resistance to stress corrosion | No cracks | pH 9,5 | ISO 6957 |

| | | | |
|--|--|------------|---------------|
| Only for DZR Brass: Resistance to dezincification ³⁾ | Maximum dezincification depth: ≤ 200 µm Average dezincification depth: ≤ 100 µm | ISO 6509-1 | ISO 6509-1 |
| Stainless steel: Resistance to intracrystalline degradation | No cracks | Method A | EN-ISO 3651-2 |
| ¹⁾ Choice of material is free. The chosen material is listed in the IQC. ²⁾ The most critical wall thickness/ DN ratio is tested. ³⁾ Copper alloys containing 15 % or less zinc provide a good resistance to dezincification and may be declared accordingly without testing. | | | |

6.5 Marking of the fittings

The products are marked with the Kiwa-mark.

Marking of the fittings

The minimum required marking on the fittings shall be:

- KIWA  or on small products  or  or **KK** or **KK*** (if not possible KIWA  only on the smallest packaging unit)**;
- manufacturer's name, trade name or logo;
- nominal outside diameter of the corresponding pipe in mm;
- production code.

Location of the marks: on every fitting.

The realization of the marks is as follows: clear, durable and indelible.

The smallest packaging unit of the fittings are provided with at least the following information:

- KIWA  ;
- manufacturer's name, trade name, system name, logo or certificate number of the accompanying technical approval (system) certificate, in accordance with the marking of the connecting pipe;
- nominal outside diameter and nominal wall thickness of the corresponding pipe in mm;
- material identification in case the fitting body is made of plastics.

Location of the marks: on every package.

The realization of the marks is as follows: clear, durable and indelible.

*) for small fittings marking with only KK is permitted

***) only after approval by Kiwa

7 Marking

7.1 General

The following marks and indications must be provided on each product and product packaging in a clear, legible and indelible way.

7.2 Certification mark

After entering into a Kiwa certification agreement, the certification mark must also be permanently and indelibly applied to the product.

See paragraphs 5.6.5 and 6.5 for marking requirements per product.

8 Quality system requirements

No additions and/or deviations from BRL K14100.

9 Summary of tests and inspections

This chapter contains an overview of the steps required for certification:

- **initial investigation:** the investigation to determine that compliance is given to all the requirements laid down in the evaluation guideline;
- **follow-up investigation:** the investigation carried out after granting the certificate to determine that the certified products continue to be in compliance with the requirements laid down in the evaluation guideline; the required frequency for the follow-up investigation by the certification body (CI) is also specified;
- **inspection of the quality system of the supplier:** monitoring compliance of the IQC scheme and procedures.

9.1 Test matrix

Table 9 - Test matrix

| BRL K 536-L | Product characteristics | Assessment within the scope of ^{1,3} : | | | |
|--|--|---|---------------------------------|-------------------------|---------------------------------|
| | | initial investigation ² | Inspection by Kiwa ² | IQC By the manufacturer | |
| | | | | During start-up | Frequency |
| Requirements and test methods for the piping system | | | | | |
| 4.1 | General | X | | | |
| 4.2.1 | Hygienic Aspects | X | 1 x year | | |
| 4.2.2 | Elastomeric sealing elements | X | 1 x year | X | 1 x batch |
| 4.2.3 | Greases and lubricants | X | 1 x year | X | 1 x batch |
| 4.3 | Joint requirements | X | 1 x year ⁴ | | |
| 4.4 | Installation instructions | X | 1 x year | | |
| Requirements and test methods for the pipes | | | | | |
| 5.1 | General | X | | | |
| 5.2 | Hygienic Aspects | X | 1 x year | | |
| 5.3 | Materials | X | | | |
| 5.3.6 | Reworkable and recycle material | X | 1 x year | | |
| 5.4 | Surface condition | X | 1 x year | X | 1 x 8 hours |
| 5.5 | Geometrical characteristics | X | 1 x year | X | 1 x 8 hours |
| 5.6 | Mechanical characteristics | X | | | |
| 5.6.1 | Long-term hydrostatic strength | X | 1 x year ⁵ | | |
| 5.6.2 | Strength of the weld seam of the metal inner layer | X | 1 x year ⁶ | | 1 x week/batch 22 h or 165 h |
| 5.6.3 | Resistance to delamination of the pipe layers | X | | | |
| 5.6.4 | Thermal durability of the outer layer | X | | | |
| 5.6.5 | Marking | X | 1 x year | X | 1 x 8 hours |
| Requirements and test methods for the fittings | | | | | |
| 6.1 | General | X | | | |
| 6.2 | Hygienic Aspects | X | 1 x year | | |
| 6.3 | Material and mechanical requirements for plastics fittings | X | 1 x year ⁷ | X ⁸ | 1 x week/batch ⁹ |
| 6.4 | Material and mechanical requirements for metal fittings | X | 1 x year | X ⁸ | 1 x week or batch ⁸ |
| 6.5 | Marking | X | 1 x year | X | 1 x 8 hours |

¹ The supplier's quality system will be evaluated by the certification body based on the IQC scheme.

This inspection will at least include the aspects specified in chapter 4 of BRL K14100. During the periodic assessment, the inspector will check the product against a selection of the above-mentioned product properties. The frequency of the periodic assessments is laid down in 86.3 Nature and frequency of periodic assessments;

² If, for whatever reason, it is not possible to perform a test in a laboratory specifically accredited to ISO/IEC 17025 and impartial for that activity, the test can be performed in consultation with the Certification body under 'witness';

³ The frequency can be adjusted in consultation with the Certification body, e.g.:

- a. in the case of a continuous (automated) measurement;
- b. if it can be demonstrated that a reduction in the frequency does not compromise the quality.

⁴ Only applicable for the test "Resistance to internal pressure"

⁵ This aspect is compared with the for this aspect ascertained acceptance parameters on the basis of the IQC inspection (indirect by means of direct related parameters).

⁶ Only applicable for the test "Resistance to internal pressure of the pipe 1000 h"

⁷ Depending on the plastics material: "Melt Flow Rate", "Resistance to internal pressure of the fitting 1000 h" (to be combined with 1000 h system test), "Degree of crosslinking"

⁸ For the aspects "appearance" and "geometrical characteristics" (dimensions)

⁹ For the aspects "appearance" and "geometrical characteristics" and depending on the plastics material "Melt Flow Rate", "Resistance to internal pressure of the fitting 22 h or 165 h", "Degree of crosslinking"

9.2 Inspection of the quality system

The supplier's quality system will be evaluated by Kiwa based on the IQC scheme.

This inspection will at least include the aspects specified in chapter 7 of BRL K14100 and table 9.

10 Agreements on the implementation of certification

No additions and/or deviations from chapter 9 of BRL K14100.

In addition to chapter 9 of BRL K14100:

10.1 Assessment of Non-Conformities

The assessment of non-conformities is laid down in an interpretation document accompanying this assessment guideline, which is published on the Kiwa website.

10.2 Sanction Procedure

The sanction policy is laid down in an interpretation document accompanying this assessment guideline, which is published on the Kiwa website.

11 Title of standards

11.1 Public law rules

Not applicable

11.2 Norms/ normative documents

| Number | Title | version* |
|-----------------------|---|----------|
| BRL K17504 | Vulcanized rubber products for cold and hot drinking water applications | |
| EN 1057 | Copper and copper alloys - Seamless, round copper tubes for water and gas in sanitary and heating applications | |
| EN 1254-3 | Copper and copper alloys - plumbing fittings - Part 3: Fittings with compression ends for use with plastic pipes | |
| EN 1254-6+A1 | Copper and copper alloys - Plumbing fittings - Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes | |
| EN 1254-8+A1 | Copper and copper alloys - Plumbing fittings - Part 8: Press fittings for use with plastics and multilayer pipes | |
| EN-ISO 10147 | Pipes and fittings made of crosslinked polyethylene (PE-X) - Estimation of the degree of crosslinking by determination of the gel content | |
| EN-ISO 1133 | Determination of the melt mass flow rate (MFR) and the melt volume (MVR) of thermoplastics | |
| EN-ISO 11357-3 | Plastics - Differential Scanning Calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization | |
| EN-ISO 1167 series | Plastics piping systems - Thermoplastics pipes - Determination of the resistance to internal pressure at constant temperature, 1995. | |
| EN-ISO 13056 | Plastics piping systems - Pressure systems for hot and cold water - Test method for leak tightness under vacuum | |
| EN-ISO 15874 series | Plastics piping systems for hot and cold water installations - Polypropylene (PP) | |
| EN-ISO 15875 part 1-2 | Plastic piping systems for hot and cold water installations- Cross-linked polyethylene (PE-X) | |

| | |
|---------------------|---|
| EN-ISO 15876 series | Plastics piping systems for hot and cold water installations - Polybutylene (PB) |
| EN-ISO 15877 series | Plastics piping systems for hot and cold water installations - Chlorinated poly(vinyl chloride) (PVC-C) |
| EN-ISO 19892 | Plastics piping systems - Thermoplastics pipes and fittings for hot and cold water - Test method for the resistance of joints to pressure cycling |
| EN-ISO 19893 | Plastics piping systems - Thermoplastics pipes and fittings for hot and cold water - Test method for the resistance of mounted assemblies to temperature cycling |
| EN-ISO 21003 series | Multilayer piping systems for hot and cold water installations - inside buildings |
| EN-ISO 22391 series | Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) |
| EN-ISO 228-1 | Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation |
| EN-ISO 2578 | Plastics - Determination of time-temperature limits after prolonged exposure to heat |
| EN-ISO 3126 | Plastics piping systems - Plastics components - Determination of dimensions |
| EN-ISO 3501 | Plastics piping systems - Mechanical joints between fittings and pressure pipes - Test method for resistance to pull-out under constant longitudinal force |
| EN-ISO 3503 | Plastics piping systems - Mechanical joints between fittings and pressure pipes - Test method for leak tightness under internal pressure of assemblies subjected to bending |
| EN-ISO 3651-2 | Determination of resistance to intercrystalline degradation of corrosion-resistant steel |
| EN-ISO 580 | Plastic piping and ducting systems - Injection-moulded thermoplastic fittings - Methods for visually assessing the effects of heating |
| EN-ISO 6509-1 | Corrosion of metals and alloys - Determination of dezincification resistance of copper alloys with zinc - Part 1: Test method |
| EN-ISO 9080 | Plastics piping and ducting systems - Determination of long-term hydrostatic strength of thermoplastics material in pipe form by extrapolation |
| EN-ISO 9969 | Thermoplastics pipes - Determination of ring stiffness |
| ISO 4070 | Polyvinylidene fluoride (PVDF) - Effect of time and temperature on expected strength |
| ISO 4076 | Polyphenylsulfone (PPSU) - Effect of time and temperature on expected strength |
| ISO 7-1 | Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation |
| ISO 10508 | Plastics piping systems for hot and cold water installations - Guidance for classification and design. |
| ISO 17454 | Plastics piping systems - Multilayer pipes - Test method for the adhesion of the different layers using a pulling rig |
| ISO 17455 | Plastics piping systems - Multilayer pipes - Determination of the oxygen permeability of the barrier pipe |

| | |
|-----------|---|
| ISO 17456 | Plastics piping systems - multilayer pipes - Determination of the long-term strength |
| ISO 6957 | Copper alloys - Ammonia test for stress corrosion in resistance |

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

Remark: if standards or normative documents are dated an annual verification will take place to verify if the normative documents are still up to date. Modifications of the applicable normative documents will be published on the services page of Kiwa's website.

Annex I: Model certificate (example)

Certificate

Product certificate
K-XXXXXXX-X

kiwa

Valid from Replaces
Page

Plastics pipes with metal inner layer intended to be applied in piping systems for hot and cold water distribution

STATEMENT BY KIWA

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

Name of business

as specified in this product certificate and marked with the Kiwa®-mark in the manner as indicated in this product certificate may, on delivery, be relied upon to comply with Kiwa evaluation guideline BRL K 536-L dated xx-xx-20xx, inclusive amendment sheet dated xx-xx-20xx.



Wim van Loon
Managing Director Nederland

Publication of this certificate is allowed.

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



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