

BRL K778
01 November 2026

Evaluation Guideline

Kiwa (technical approval with) product certificate for cement mortar lining of drinking water pipes and fittings

kiwa

Preface

This Evaluation Guideline (BRL) has been developed by the Board of Experts Water Chain (CWK) which represents all relevant parties in the field of **cement mortar lining of drinking water pipes and fittings**. The Board of Experts Water Chain (CWK) also supervises the certification activities and updates this BRL if required. All references to Board of Experts in this evaluation guideline pertain to the Board of Experts Water Chain (CWK).

This BRL will be used by Kiwa in conjunction with the Kiwa Regulations for Certification and BRL K14100 'General requirements for products in contact with drinking water', which sets out Kiwa's general rules for certification.

This BRL is issued in Dutch and English. In the event of any difference in the text or interpretation between the Dutch and English versions of this BRL, the Dutch version shall prevail.

Kiwa Nederland B.V.
Sir Winston Churchilllaan 273
P.O. Box 70
2280 AB Rijswijk

Tel. 088 998 44 00
NL.Kiwa.info@Kiwa.com
www.kiwa.com

© 2026 Kiwa N.V.
All rights reserved. No part of this report may be reproduced, stored in a database or retrieval system, or published, in any form or in any way, electronically, mechanically, by print, photoprint, microfilm or any other means without prior written permission from the publisher.
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 01-November-2026.

Contents

1.	**Introduction**	**3**
1.1.	General	3
1.2.	Scope	3
1.3.	Acceptance of test reports provided by the supplier	3
1.4.	Quality declaration	3
2.	**Terminology**	**3**
2.1.	Definitions	3
3.	**Procedure for granting a Kiwa-product certificate**	**3**
4.	**Product requirements and determination methods**	**4**
4.1.	General	4
4.2.	Hygenic aspects	4
4.3.	Composition of the cement mortar	4
4.4.	Surface conditions before the application of lining	4
4.5.	Application of the lining	5
4.6.	Curing	5
4.7.	Post treatment	5
4.8.	Thickness of the applied lining	6
4.9.	Appearance and surface conditions of the lining	6
4.10.	Strength of the lining	6
4.11.	Repairs	6
5.	**Marking**	**8**
5.1.	General marking	8
5.2.	Certification marking	8
6.	**Requirements in respect of the quality management system**	**8**
7.	**Summary of investigations required for type testing and inspections**	**9**
8.	**Agreements on the implementation of certification**	**9**
9.	**List of documents**	**10**
Annex I	**Model certificate**	**11**

1. Introduction

1.1. General

No additions to or deviations from §1.1 of BRL K14100 apply.
Wherever BRL K14100 refers to the "applicable assessment guideline", this shall be understood to mean BRL K778.

This BRL K778 d.d. 2026-11-01 replaces BRL-K778 d.d. 2012-02-01.

Quality declarations issued on the basis of BRL K778, dated 2012-02-01, shall remain valid for a maximum period of 12 months after the publication date of this BRL.

1.2. Scope

In addition to §1.2 of BRL K14100, the following applies.
The cement mortar lining is intended to be applied on:

- Steel and ductile iron pipes and fittings;
- used for conveying drinking water or raw water intended for the preparation of drinking water;
- installed above or underground;
- conveyance under pressure or by gravity;
- temperature of the water transported not exceeding 50 °C

1.3. Acceptance of test reports provided by the supplier

No additions to or deviations from §1.3 of BRL K14100.

1.4. Quality declaration

In addition to §1.4 of BRL K14100.
The quality declarations to be issued on the basis of this BRL are referred to as Kiwa technical approval with product certificate.
A model of the product certificate is included for information purposes in Annex I.

2. Terminology

2.1. Definitions

In addition to §2.1of BRL K14100 the following terms and definitions are applicable:

- **Certification mark**: a protected mark, the use of which is authorized by Kiwa for the supplier whose products or processes can, upon delivery, be deemed to comply with the applicable requirements.
- **Surveillance inspection**: the inspection conducted after certification is granted in order to determine that the certified products and/or approved quality-related processes continue to meet the requirements set out in the BRLs.

3. Procedure for granting a Kiwa-product certificate

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

4. Product requirements and determination methods

4.1. General

This chapter contains the requirements that the product shall meet, as well as the methods in order to determine that the requirements are met.
The requirements and determination methods set in this evaluation guidelines are based on:

- NEN-EN 10298 “Steel tubes and fittings for on shore and off shore pipelines - Internal lining with cement mortar”
- NEN-EN 545 “Ductile iron pipes, fittings, accessories and their joints for water pipelines - Requirements and test methods”
- ISO 4179 “Ductile iron pipes and fittings for pressure and non-pressure pipelines - Cement mortar lining”

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

- production process/implementation process;
- constituent raw materials, materials, and products;
- formulation.

Any proposed change to the aforementioned parameters shall be reported to the certification body. The certification body shall assess whether the change could affect the certified product and whether a reassessment of the product shall be required. The certification body determines what constitutes a significant change. Once it has been determined that the product with the proposed change continue to meet the requirements of §4, the change can be implemented by the certificate holder.

4.2. Hygenic aspects

The products shall demonstrably meet the requirements as stated in BRL K14101 "Hygienic aspects for products in contact with drinking water and hot tap water"

4.3. Composition of the cement mortar

The following requirements shall apply:

- The cement mortar mix shall consist of cement, sand, and water, and admixtures or additives may be used. The following applies:
  - All the ingredients of the cement mortar mix shall be suitable for contact with drinking water according to (4.2), and
  - Shall comply with the requirements given in the applicable standard EN10298 or EN 545
  - The type of cement used shall have a CE marking.
  - The water shall comply with Drinking Water Directive 2020/2184.
- The mixing ratios shall be determined by the supplier and shall comply with the applicable standard EN 10298 or EN545.
- The type of cement and whether admixtures and/or additives are used shall be declared on the certificate, as demonstrated in the Model Certificate in Annex I.

4.4. Surface conditions before the application of lining

The internal surface to be lined shall be free from objects that can adversely affect the lining or impair its application. Loose rust, loose mill scale, dirt, debris, oil, grease, paint and other material that may have originated from an external coating process, scattered

weld beads as well as blasting residues and/or chemical cleaning process residues shall be removed. However the presence of a light adhesive rust layer does not impair the performance of a cement mortar lining and may be left.

4.5. Application of the lining

Cement mortar linings can be applied in three ways:

a) The centrifugation-method (rotating pipe)
b) The spinning-head-method (non-rotating pipe)
c) The manual-method

The application process shall be determined by the supplier in line with the applicable standards; EN 10298, EN 545, or ISO 4179

Application of the cement mortar on site

The supplier shall provide instructions for the application of cement mortar lining on the joining areas of pipe ends, where such application is carried out by the customer or end user at the installation site.

The instructions shall be sufficient to ensure that the application is carried out in a manner that maintains compliance of the cement mortar lining with the requirements of this BRL. The instructions shall specify at least the following:

- The materials to be used;
- The method of preparation and application;
- The conditions under which the work shall be performed; and
- The method for verifying that the cement mortar lining complies with the requirements of this BRL.

Note: Verification that work carried out by the customer or end user at the installation site has been performed in accordance with the supplier's instructions is outside the scope of this certification scheme.

4.6. Curing

After the application of the fresh lining, controlled curing shall be carried out to provide sufficient hydration of the cement. The lining shall be kept damp, and the surface temperature shall not be allowed to fall below 5 °C. To prevent the lining from drying too rapidly, the pipe ends shall be capped or sealed, unless the lining is allowed to cure under moist/warm conditions or in a draught-free closed space. Curing may be accelerated, and the uniformity of the lining ensured, by suitably adjusting the temperature and humidity of the lining in a regular treatment cycle. The curing period shall be sufficient to ensure that the pipes and fittings can be transported and stacked without damage to the lining.
Any curing compounds used shall be suitable for contact with drinking water in accordance with (4.2)

4.7. Post treatment

Post-treatments and surface protection systems may be used to enhance the performance of the lining. Any post-treatment used shall be suitable for contact with drinking water in accordance with (4.2)

An indication of whether post-treatment is used shall be declared on the certificate, as demonstrated in the Model Certificate in Annex I.

4.8. Thickness of the applied lining

The thickness of the lining shall comply with the values specified in the applicable standards EN 10298 or EN 545.
The thickness of the mortar shall be measured as follows:

- According to the method specified in the applicable standards EN 10298 or EN 545.
- For pipes: measurements shall be made at more than 200 mm from each end of the pipe at four points (90° diametrically opposed points in the same cross section). Separate measurements shall be taken over weld seams for submerged arc welded pipes.
- For fittings: measurements shall be made at each end of the fitting at four points (90° diametrically opposed points in the same cross section).
- All readings shall meet the minimum thickness values specified in the applicable standards EN 10298 or EN 545.
- The calculated average of all readings shall be greater than or equal to the nominal thickness value specified in the applicable standards.

4.9. Appearance and surface conditions of the lining

The surface of the cement mortar lining shall be uniform, smooth, free from cavities, defects resulting from poor mixing, and any visible foreign bodies. Trowel marks, protrusion of sand grains, and surface texture inherent to the method of application are acceptable. However, there shall be no recesses or local defects that reduce the thickness below the minimum values specified in the applicable standards.

The formation of hairline cracks, shrinkage cracks, and radial displacements in the dry lining cannot be avoided and is acceptable , provided that the crack width and radial displacement (disbondment) do not exceed the values specified in the applicable standards EN 10298 or EN 545. If the crack width or radial displacement exceeds the permissible limits, it shall be repaired.

Cracks and radial displacement shall be measured after curing of the lining and under normal storage conditions, using a magnifying glass or a suitable gauge.

4.10. Strength of the lining

The strength of the lining shall comply with the requirements specified in the applicable standard EN 10298 or EN 545. Strength tests should be carried out according to the procedure described in EN 10298 or EN 545.

4.11. Repairs

Repairs of damages, imperfections, or defects in the cement mortar lining shall be carried out only using materials that comply with the requirements of 4.2.

Repair of cement mortar lining on site
The supplier shall provide instructions for the repair of cement mortar lining where such repairs are carried out by the customer or end user at the installation site.

The instructions shall be sufficient to ensure that the repairs are carried out in a manner that maintains compliance of the cement mortar lining with the requirements of this BRL. The instructions shall specify at least the following:

- The materials to be used;
- The method of preparation and repair;
- The conditions under which the repair work shall be performed; and

- The method for verifying that the repaired cement mortar lining complies with the requirements of this BRL.

Note: Verification that repairs carried out by the customer or end user at the installation site have been performed in accordance with the supplier's instructions is outside the scope of this certification scheme.

5. Marking

The markings described below shall be applied to the external surface of the lined pipes or fitting using a suitable method - such as painting, stenciling, or printing - that provides clear, legible, and durable identification.

5.1. General marking

The lined pipes or fittings shall be marked with following:

- Supplier's name and/or registered trademark
- Production date or production code
- Other identification agreed with the concerned parties

5.2. Certification marking

After entering into a Kiwa certification agreement, the certified products shall marked with the one of following certification mark:

- KIWA 
-  or  or  KK for smaller items
- Written text "Kiwa Water Mark"

6. Requirements in respect of the quality management system

No additions and/or deviations from chapter 7 of BRL K14100.

7. Summary of investigations required for type testing and inspections

This chapter provides a summary of the work to be carried out during certification:

7.1 Assessment matrix

Description of requirement	Article BRL	Investigation within the scope of		
		Initial Investigation	Supervision by Kiwa after certificate is granted [a) b)]	
			Inspection	Frequency
Product requirements				
Hygienic aspects	4.2	X	X	1x/year
Composition of the cement mortar	4.3			1x/year
Surface conditions before application of lining	4.4	X	X	Every visit
Application of the lining	4.5	X	X	Every visit
Curing	4.6	X	X	Every visit
Post treatment	4.7	X	X	Every visit
Thickness of the applied lining	4.8	X	X	Every visit
Appearance and surface conditions of the lining	4.9	X	X	Every visit
Strength of the lining	4.10	X	X	1x/year
Repairs	4.11	X	X	Every visit
Markings				
General marking	5.1	X	X	Every visit
Certification marking	5.2	X	X	Every visit

a) In the event of changes to the product or production process Kiwa shall, in consultation between the supplier, determine whether the product meets the performance requirements..

b) During the inspection, the inspector checks the products against a selection of the product requirements as detailed above. The frequency of inspection visits is specified in §9.5 of BRL K14100.

7.2 Quality system control

The supplier's quality system shall be assessed by Kiwa. This assessment shall include at least the aspects listed in chapter 7 of BRL K14100.

8. Agreements on the implementation of certification

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

9. List of documents

Number	Title	Version
NEN-EN 10298	Steel tubes and fittings for on shore and off shore pipelines - Internal lining with cement mortar	2005
NEN-EN 545	Ductile iron pipes, fittings, accessories and their joints for water pipelines - Requirements and test methods	2010
ISO 4179	Ductile iron pipes and fittings for pressure and non-pressure pipelines - Cement mortar lining	2024

Annex I Model certificate

Certificate

Product certificate

K-XXXXXXX-X

kiwa

Valid from	Fill in date	Replaces	Fill in text
		Page	1 of xx

Cement mortar lining of drinking water pipes and fittings

KIWA DECLARATION

With this product certificate, issued in accordance with the Kiwa Regulations for Certification, Kiwa declares that there is justified confidence that the product supplied by

Name of business

as specified in this product certificate and bearing the Kiwa® mark indicated under “Marks,” comply at the time of delivery with the Kiwa evaluation guidelines:

- BRL K778 “Cement mortar lining of drinking water pipes and fittings” dated dd-mm-jjjj.
- BRL K14100 "General requirements for products in contact with drinking and hot tap water" dated dd-mm-jjjj,
- BRL K14101 "Hygienic aspects for products in contact with drinking and hot water” dated dd-mm-jjjj.

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.

RvA PRODUCTS C 002

Kiwa Nederland B.V.
Sir Winston Churchilllaan 273
P.O. Box 70
2280 AB RIJSWIJK
The Netherlands
Tel. +31 88 998 44 00
NL.Kiwa.Info@kiwa.com
www.kiwa.com

Certificate holder
Fill in text

Production location
Fill in text

Product certificate
K-XXXXXXX-X

Cement mortar lining of drinking water pipes and fittings

PRODUCT SPECIFICATION
Cement mortar lining with the following specifications:

Cement Type	☐ CEM I Portland cement ☐ CEM III blastfurnace cement
Admixtures/additives	☐ With admixtures/additives ☐ Without admixtures/additives
Post treatment	☐ With post treatment ☐ Without post treatment

Fitness for contact with drinking water
This product is approved on the basis of the requirements for hygienic aspects set in the "Regeling materialen en chemicaliën drink- en warm tapwatervoorziening" ("Materials and chemicals in the supply of drinking water and warm tap water Regulation" dated 01-07-2017; published in the Government Gazette).

These hygienic aspects are based on two main criteria. The product shall permanently comply with:
- The product recipe approved during the assessment procedure. This recipe is not to be changed without prior approval by Kiwa according to the Kiwa approval procedure for the hygienic aspects;
- Specific product requirements for the hygienic aspects.

For confidentiality reasons, the recipe and specific product requirements are included in the non-public 'Appendix Hygienic Aspects' to this certificate.

MARKING
The Kiwa® approved products are marked with:

- KIWA , or
- or or KK or KK for smaller items, or
- Written text "Kiwa Water Mark"

Place of the mark: applied to the external surface of the lined pipe or fitting

Mandatory specifications:
The lined pipes or fittings shall be marked with following:
- Supplier's name and/or registered trademark
- Production date or production code
- Other identification agreed with the concerned parties

Method of marking:
- Non-erasable and durable such as painting, stenciling, or printing
- Clear and visible after assembly.

APPLICATION AND USE
The cement mortar lining is intended to be applied on:
- Steel and ductile iron pipes and fittings
- used for conveying drinking water or raw water intended for the preparation of drinking water
- installed above or underground
- conveyance under pressure or by gravity
- temperature of the water transported not exceeding 50 °C

Product certificate

K-XXXXXXX-X

Cement mortar lining of drinking water pipes and fittings

RECOMMENDATIONS FOR THE CUSTOMERS

At the time of delivery, verify that:

- the products delivered correspond to the agreement
- the marking and method of marking are correct
- the the products show no visible defects caused by transport or similar causes.

If you should reject a product on the basis of the above, please contact:

- Fill in text

and, if necessary,

- Kiwa Nederland B.V.

Consult the instructions of the certificate holder for the correct method of storage, transport, and handling.