Final draft BRL 5217-2
comments before 2019-08-19

Evaluation guideline

For the KOMO® product certificate for

Plastics piping systems for renovation of piping systems for rain and waste water discharge within the building structure using cured-in-place pipes with diameters up to and including 200 mm – part 2: Products.

Determined by Board of Experts Plastics piping systems on jjjj-mm-dd.

Accepted by the Harmonisation Commission Bouw of the Stichting Bouwkwaliteit on jjjj-mm-dd.

Preface Kiwa

This evaluation guideline (BRL) has been prepared by the Board of Experts “Plastics Piping Systems” of Kiwa, in which interested parties in the area of “Plastics piping systems for renovation of piping systems for rain and waste water discharge within the building structure using cured-in-place pipes with diameters up to and including 200 mm – Products” are represented. This board guides the implementation of certification and shall, if necessary adjust the evaluation guideline. Wherever the term “Board of Experts” is used in this evaluation guideline, the above mentioned Board of Experts is meant.

Kiwa will use this evaluation guideline in conjunction with the Kiwa Regulations for Product Certification. These regulations embody the examination procedure laid down by Kiwa for the issue of a product certificate as well the procedure for external inspection.

This evaluation guideline constitutes together with part 1 – “Installation” a series of guidelines, wherein requirements are set for the installation and the intermediate products and the end product of cured-in-place pipes.

This second edition replaces the first edition of BRL 5217-2, which has been technically revised. The main modification is:

- Technical requirements are now in agreement with DIBt technical requirements

Declaration of validation
This evaluation guideline is declared binding by Kiwa by binding declaration date jjjj-mm-dd.

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Content

1 Introduction

1.1 General

The requirements embodied in this evaluation guideline (BRL) shall be used by certification bodies that are accredited by the Dutch Accreditation Council (RvA) which have a license with KOMO when dealing with applications for the issue or maintenance a KOMO® certificate for plastics piping systems for renovation of piping systems for rain and waste water discharge within the building structure using cured-in-place pipes with diameters up to and including 200 mm – part 2: Products.

The issued quality mark is called KOMO® product certificate.

Besides the requirements embodied in this evaluation guideline, certification bodies impose additional requirements in the sense of requirements with regard to general procedures for certification as laid down in the general certification regulations of the respective certification body.

This evaluation guideline supersedes BRL 5217-2 dated 2013-04-01.
Product certificates issued on the basis of that evaluation guideline lose their validity after 2019-mm-dd.

During the execution of certification activities, the certification bodies have to fulfil the requirements as laid down in the chapter 'Requirements imposed on the certification body'.

This BRL cannot be used to issue product certificates that shall be recognized within the context of the Dutch Building Act ("Bouwbesluit").

1.2 Field of application

The field of application is a renovation technique for rain and waste water drainage systems which operate under gravity. It is applicable for drainage systems:

- inside buildings (marked with "B");
- for both inside buildings and buried in ground within the building structure (marked with "BD").

Note 1: The application area "inside buildings" according to this evaluation guideline, applies to the interior area of the building only. The application area "within the building structure" conforms to the requirements for "inside buildings" according to NEN 3215 (see figure 1).

Note 2: Repair systems are not part of this guideline.

The applied technique regards lining with cured-in-place pipes and for pipes with diameters up to and including 200 mm and if applicable renovation systems for the connections.

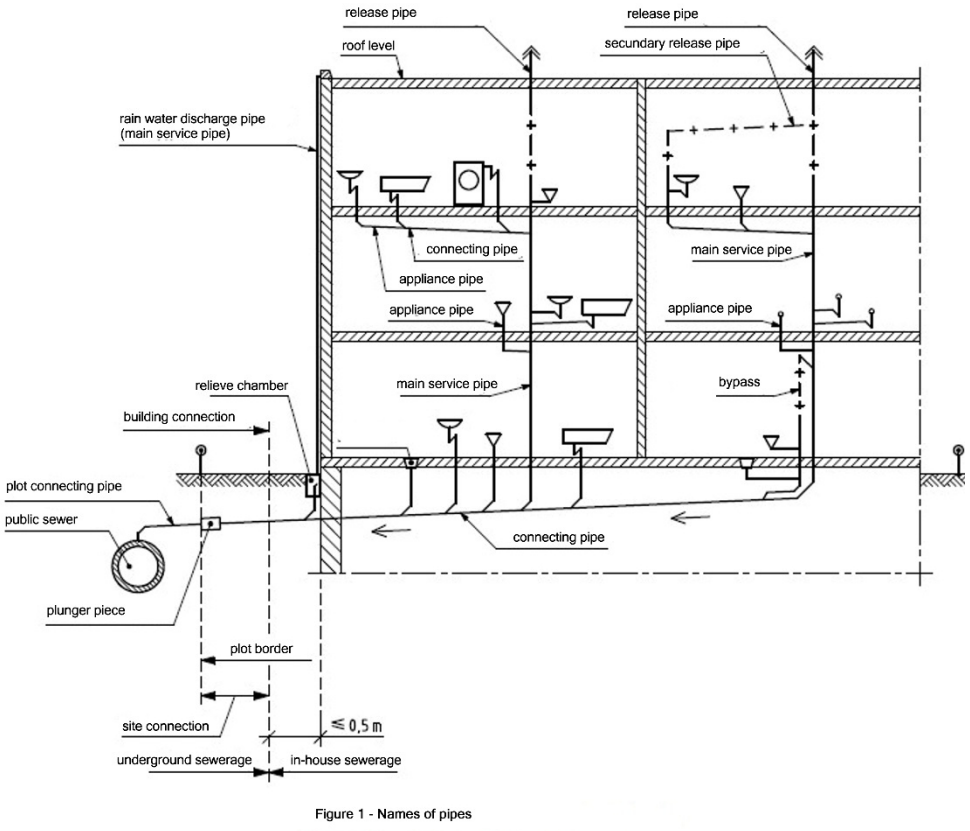


Figure 1 - Field of application (source NEN 3215).

1.3 Object of certification

The object of certification are products that can be used in a renovation system that includes a cured-in-place pipe lining for a pipe section and a watertight and durable connection between pipes in case connections are included in the liner system to be certified.

Examples of connections are:

- Connection with a renovated connecting pipe and renovated main service pipe;
- Connection with liner and existing pipe that will not be renovated;
- Connection of two liners (in main service pipe or connecting pipe).

Excluded are connections between a connecting pipe and a discharge device.

Renovation of laterals to the main sewer are covered in this evaluation guideline. The connections of these laterals to the main sewer are not covered.

1.4 Relation with European regulation no 305/2011.

There is no harmonized European standard for the GRP products that fall within the scope of this evaluation guideline.

1.5 Acceptance of test reports provided by the supplier

If the supplier submits reports from research bodies or laboratories to show that the requirements of the evaluation guideline are met, then these reports have to be prepared by a body meeting the prevailing accreditation standard, i.e.:

- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17020-1 for inspection bodies;
- NEN-EN-ISO/IEC 17065 for certification bodies certifying products;
- NEN-EN-ISO/IEC 17021-1 for certification bodies certifying management systems;
- NEN-EN-ISO/IEC 17024 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 the Dutch Accreditation Council or an accreditation body with which the Dutch Accreditation Council has concluded a mutual acceptance agreement.
This accreditation shall relate to the tests required for this evaluation guideline.
If no accreditation certificate can be submitted, the certification body itself shall verify whether the accreditation standard has been met or (let) carry out the tests concerned itself.
If it concerns a test laboratory then the certification body shall perform one or more audits at this laboratory to verify among others whether the execution of the tests in question is in accordance with the requirements of NEN-EN-ISO/IEC 17025.

1.6 Product certificate

Based on the KOMO system that applies to this evaluation guideline KOMO® product certificates are issued.

On the website of the KOMO foundation (www.komo.nl) the model certificate is listed, which is applicable for this evaluation guideline. The product certificate which will be issued is to be in accordance with this.

The products that fulfil the requirements listed in chapter 4 shall be mentioned in the product certificate.

2 Terminology

For terms related to the conformity assessment is referred to the website of the Foundation KOMO (www.komo.nl) and the regulations of the certification body.

2.1 General definitions

In this evaluation guideline the meanings of the following terms are:

2.1.1 Evaluation guideline (BRL)

The agreements made within the Board of Experts on the subject of certification.

2.1.2 Board of Experts

The Board of Experts “Plastics Piping Systems”.

2.1.3 Supplier

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

2.1.4 IQC scheme

A description of the quality inspections carried out by the supplier as part of his quality system.

2.1.5 Requirements and determination methods

In this evaluation guideline requirements and determination methods are included, by which the following is meant:

2.1.5.1 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.

2.1.5.2 Determination methods

Product investigation 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.

2.1.6 Type Testing (TT)

Testing performed to verify that the material, product, joint or assembly is capable of conforming to the requirements given in the relevant standard.

Note: The type test results remain valid until there is a change in the material or product or assembly.

2.1.7 Audit Test (AT)

Test performed by a test laboratory on behalf of an inspection body or certification body to confirm that the product continues to conform to the requirements given in the relevant standard and to provide information to assess the effectiveness of the quality management system.

2.1.8 Batch release test (BRT)

Test performed by or on behalf of the manufacturer on a batch of products, which has to be satisfactory completed before the batch can be released.

2.2 Terms and definitions related to this type of products

In this evaluation guideline the terms and definitions given in NEN-EN-ISO 11296-1 and NEN-EN-ISO 11296-4 and NEN 3215 apply.

3 Initial assessment

3.1 General

The certification is on a voluntary basis.
When the applicant / supplier has more production locations, the applicant / supplier shall specify which production locations are concerned.

3.2 Product investigation

For the purpose of obtaining the KOMO product certificate the certification body executes an investigation. To this product investigation belong:

- verification of the documents provided by the supplier c.q. shall be provided by the suplier to assess if there is complaince with the requirements laid down in the evaluation guideline;
- determination of the characterictis of products of assemblies of products as listed in the evaluation guideline.
- Assessment of the processing instructions of the supplier.

3.3 Evaluation of the quality system

For the purpose of obtaining the KOMO product certificate the certification body executes an investigation. To this entrance investigation program belong:

- assessment of the production process;
- assessment of the quality system and the IQC scheme;
- testing for the presence and functioning of the other required procedures.

It must be the extent to which the quality system complies with the requirements as laid down in the chapter 5 of this evaluation guideline.

3.4 Granting the quality declaration

After completion of the investigations (clause 3.2 and clause 3.3), results are laid down to the decision maker. The decision maker evaluates the results and determines whether the certificate can be issued or whether additional information and / or tests are required in order to be able to issue the certificate.

4 Product requirements

4.1 General

The following information must be provided by the supplier before commencing the product investigation:

- Specification of the equipment used for installation.
- Presentation of the individual process steps, detailed description of all the process steps e.g. the rehabilitation of side connections (open / closed construction).
- Manufacturer's program with drawings of the components.
- Details related to wall construction of the components.
- Material composition in percent for each material component with indication of individual significant characteristic values (if possible using the material data sheets of the DIBt).
- Information on resin type (if possible with normative information, heat resistance > 93 ° C).
- Information about the carrier material.
- Information on possible fillers (with indication of the moisture content, the purity).
- Information on permeant liners and pre-liners.
- Description of the production of the liners with details of the parameters monitored during the factory production control.
- Information about the largest possible deflections.
- Information on maximum wrinkling (folds).
- Possibly, nominal data relating to the maximum pull-in forces.

As part of the quality control tests, the testing laboratory must check and record the aforementioned information.

4.2 Declaration of the liner system

For each lining tube and all other components required for installing and making the connection applies that the:

- description of the built up and drawing with dimensions of the lining tube(s);
- description of the built up and drawing with dimensions of the connection;
- when relevant, description and composition of the seal / grout;
- tolerances (dimensions, materials);
- product names and product types of the materials;
- technical specifications of the material and products;
- work instructions of the components.

shall be specified to the certification body.

4.3 Material characteristics

The following evidence must be provided:

- resin types used in the rehabilitation process by submitting test reports based on NEN-EN 10204: 2004 clause 3.2;
- carrier material used in the rehabilitation process by submitting test reports based on NEN-EN 10204:2004 clause 3.2;
- properties of the permanent liners and pre-liners by submission of factory certificates in accordance with NEN-EN 10204:2004 clause 3.2.

The following properties shall be checked (see table 2):

Table 2 – Properties of the incoming goods

Component	Property [1)]
Resin	Resin type
	Viscosity
	Density
	Purity
	Reactivity
	pH value
Carrier material	Mass per unit area (fabric, woven)
	Mass per unit length (yarns)
	UV transmittance
1. Test methods and maximum allowable deviations from the nominal value shall be listed in the IQC-scheme of the supplier.	

Of all resins that can be used, an infrared spectrometry analyses shall be made.

4.4 Performance tests

The following tests shall be carried out on the test pieces:

4.4.1 Checking the cure

Testing the cure by determining the glass transition temperatures, TG1 (first heating phase) and TG2 (second heating phase) by DSC analysis in accordance with NEN-EN-ISO 11357-2.

4.4.2 Water leaktightness of the laminate

Water leaktightness of the laminate (testing of the wall structure without external and internal protective foils: testing with water overpressure or supression of 0.5 bar on hardened pipe cuts).

4.4.3 Wall construction and wall thickness

Wall construction and wall thickness in accordance with NEN-EN-ISO 11296-4. Check for uniformity, e.g. using a thin section).

4.4.4 Glass / resin / filler content

If glass fibres are used as the carrier material, the glass, resin and filler content shall be determined according to NEN-EN-ISO 1172. The nominal glass content and permissible deviations shall be declared by the supplier.

4.4.5 Fire behaviour

Fire behaviour (proof of at least the normal flammability B2 according to NEN-EN 13501-1 or DIN 4102-1.

4.4.6 Density

Density of the CIPP shall be determined according to NEN-EN-ISO 1183-1. The nominal value and permissible deviations shall be declared by the supplier.

4.4.7 Chemical resistance

Verification of the resistance of the CIPP to the chemical load caused by domestic sewage. Proof of resistance in the range of pH 2 (test in sulfuric acid) to pH 12 (test in caustic soda) and compared to commercial sanitary cleaner (5% peroxide in an aqueous solution). The change in % of the following properties after 28 day

immersion in the test liquid at a temperature of (23 ± 2) ° C shall be checked. The following permissible deviations in % after media load apply (see table 3):

Table 3 – Maximum permissible change of CIPP material after 28 days exposure at a temperature of 23°C.

Property	Permissible deviation [1)]
mass	≤ 2 %
tensile strength	≤ 10 %
elongation at break	≤ 20 %
impact strength	≤ 10 %
1. If the permissible deviations are not met, an additional test in accordance with ISO 11296-4:2018 clause C in the appropriate test liquid shall be carried out.	

4.4.8 Resistance to elevated temperature cycling

Checking the resistance to elevated temperature cycling of the CIPP in accordance with the requirements of NEN-EN-ISO 13257. This check is not required for CIPP, which are intended only for the rehabilitation of rainwater pipes.

4.4.9 (pre-)liners

If applicable, evaluation of individual properties of films (pre-liners) e.g. elongation properties, determination of defects (if they are part of the CIPP system).

4.4.10 Cleaning ability

Checking the cleaning ability (single-jet nozzles) in accordance with CEN/TR 14920 with test parameters conforming to CEN-TR 14920:2015 table 2.

4.5 Simulated installations

Given that the processing of CIPP, irrespective of curing system, is sensitive to heat loss to the existing pipeline and surround, the thermal environment of simulated installations used to produce representative samples for type testing shall be controlled.

If the simulated installation test is not carried out on a special test bench but in a building, the respective state building regulations must be observed: this means that individual approval by the relevant supreme applicant is required for such a measure. In situ testing should, as far as possible, take into account the procedural limits specified by the supplier, i.e. the test should cover the smallest and possibly also the largest nominal diameter of the process. The in situ test must also take into account the reconnection of manifolds to downpipes.

The in-situ test is to be carried out by the representative of the test centre who has also carried out the tests of chemical and physical properties in the laboratory.

A representative of a certification body shall be present at the in-situ test.

The following points have to be proven as part of the in simulated installation test:

- Proof of the feasibility of placing the liner with the equipment and tools to be provided by the suppler.
- Proof of feasibility of watertight connection of manifolds to downpipes.
- Proof of the feasibility of watertight connection of side connection pipes to manifolds.

- Proof of the bond of the CIPP to the old pipe.
- Water resistance of the rebuilt pipe (including the water tightness of the connection area of manifolds, check by full filling of the rebuilt pipe: Test of the behaviour under temperature change load in accordance with the tests according to DIN 4060.

Verification of the surfaces regularity of the CIPP (no distortions that could promote blockage).

4.6 Sampling

When taking samples e.g. at the construction site, care should be taken to ensure that the sample is handled and stored immediately after collection, so that the characteristics of the samples are not altered.

4.7 Testing of installed CIPP

Tests on sample to be taken at the construction site during inspections:

- Verification of curing by DSC analysis.
- Wall construction and wall thickness.
- Proof of the essential ingredients, for example by means of ashing.
- Density.
- Verification of resin identity using infrared spectroscopy.

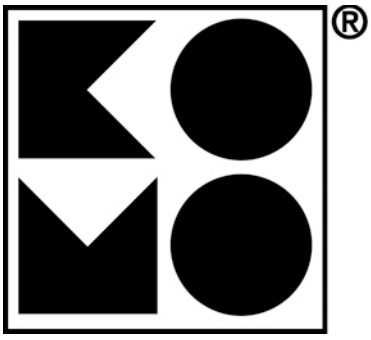
Note: See BRL 5217-1: installation

4.8 Marking

The individual components of the liner system are not marked with the KOMO® certification mark.
Each component shall be marked – on the product itself or on the packaging – with the following indications:

- manafacturer name or registered trademark;
- date of production or encoding;
- type designation.

A certified supplier of the liner system is allowed to mention the KOMO certification mark in combination with the certificate number in e.g. quotations, information leaflet's, on website etc.



5 Manufacturers quality system requirements

This chapter contains the requirements that have to be fulfilled by the manufacturer's quality system.

5.1 Manager of the quality system

Within the manufacturer's organisational structure an employee must be appointed who is responsible of managing the quality system.

5.2 Internal quality control/quality plan

As part of the quality system the manufacturer must implement an internal quality control schedule (IQC-scheme).

In this IQC-scheme the following must be demonstrably recorded:

- which aspects are inspected by the manufacturer;
- according to which methods these inspections are carried out;
- how often these inspections are carried out;
- how the inspection results are registered and stored.

The schedule must be in the format as shown in annex I listed model IQC scheme and must be detailed in such a way that it provides the CB sufficient confidence that requirements will be continuously fulfilled.

At the time of the assessment this schedule must function for a minimum of three months.

5.3 Control of test and measuring equipment

The supplier shall verify the availability of necessary test and measuring equipment for demonstrating product conformity with the requirements in this evaluation guideline. When required the equipment shall be kept calibrated (e.g. recalibration at interval). The status of actual calibration of each equipment shall be demonstrated by traceability through an unique ID. The supplier must keep records of the calibration results. The supplier shall review the validity of measuring data when it is established at calibration that the equipment is not suitable anymore.

5.4 Procedures and work instructions

The manufacturer must be able to submit:

- procedures for:
  - the handling of non-conforming products;
  - corrective actions in case non-conformities are found;
  - the handling of complaints regarding the products and / or services supplied;
- the work instructions and inspection sheets in use.
- instructions for packaging and closing off of products during storage and transport.

6 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.

6.1 Test matrix

Description of requirement	Clause BRL	Test within the scope of		
		Pre-certification tests	Surveillance by Kiwa after issue of the certificate[1)]	
			Inspection[2)]	Frequency
General	4.1	x		
Declaration of the liner system	4.2	x	x	
Material characteristics	4.3	x	x	
Checking the cure	4.4.1	x		
Water leaktightness of the laminate	4.4.2	x		
Wall construction and wall thickness	4.4.3	x	x	
Glass / resin / filler content	4.4.4	x		
Fire behaviour	4.4.5	x		
Density	4.4.6	x		
Chemical resistance	4.4.7	x		
Resistance to elevated temperature cycling	4.4.8	x		
(pre-)liners	4.4.9	x		
Cleaning ability	4.4.10	x		
Simulated installations	4.5	x		
Sampling	4.6	x		
Testing of installed CIPP	4.7	x		
Marking	4.8	x	x	

1) In case the product or production process changes significantly, the performance requirements must be determined again.
2) All product properties that can be determined within the visiting time (maximum 1 day) are determined by the inspector or by the supplier in the presence of the inspector. In case this is not possible, an agreement will be made between the certification body and the supplier about how the inspection will take place.
3) 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)
4) To be inspected at the location of the certificate holder which is certified according BRL 5217-1.

6.2 Evaluation of the quality system

During each inspection visit the quality system of the supplier shall be examined and evaluated.

7 Requirements for the certification body

7.1 General

The certification body shall be accredited for the subject of this BRL according to NEN-EN-ISO/IEC 17065 by the Dutch Accreditation Council and which have a license agreement with KOMO.

The certification body must have the disposal of a regulation, or an equivalent document, in which the general rules for certification are laid down. In particular these are:

- The general rules for carrying out the product investigation, to be distinguished in:
  - The way suppliers are informed about the handling of the application;
  - execution of the product investigation;
  - the decision with regard to the product investigation executed.
- The general rules with regard to the execution of inspections and the inspection aspects to be employed;
- The measures to be taken by the certification body in the event of nonconformities;
- The rules for termination of the certificate;
- The possibility of lodging appeal against decisions or measures made by the certification body.

7.2 Staff involved in the conformity assessment

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

- Certification assessor / Reviewer: in charge of carrying out the design and document evaluations, applications and admission of applications and the review of conformity assessments;
- Site assessor: in charge of carrying out external inspections at the supplier's works;
- Decision-makers: in charge of taking decisions in connection with the precertification tests performed, continuing the certification in connection with the inspections performed and taking decisions on the need of corrective actions.

7.2.1 Competence requirements

The competence requirements are composed of:

- Basic and technical competence requirements that comply with the NEN-EN-ISO/IEC 17065 requirements;
- Technical competence requirements established additionally by the Board of Experts for the subject of this BRL.

Education and experience of the executive staff involved in certification shall be demonstrably be documented (see table 12).

Table 12 - Education and experience of certification personnel.

	Certification assessor / Reviewer	Site assessor	Decision maker
Basic competence			
Knowledge of company processes Can competently judge.	• Bachelor (HBO) thinking and working level • 1 year relevant work experience	• High school (MBO) thinking and working level • 1 year relevant work experience	• Bachelor (HBO) thinking and working level • 5 years of working experience from which at least 1 year with respect to certification
Audit skills	• Detailed knowledge of the BRL or similar BRL's	• Knowledge about witness testing • Knowledge of the parts of the BRL with respect to quality systems and testing	• Not applicable.
Technical competence			
Relevant knowledge of: • the technology of the manufacture of the products to be inspected, the implementation of processes and services are provided; • The way products are used, processes are performed and services are provided; • Any defect which may occur during the use of the product, any error in the execution of processes and any inadequacy in the provision of services.	• HBO thinking and working level. • Minimum of 1 year experience in manufacturing, testing, inspection and / or installation, • including: - two inspections under supervision Or Internal training including: - two inspections under supervision.	• MBO thinking and working level. • Minimum of 1 year experience in manufacturing, testing, inspection and/or installation. • including three inspections under supervision Or Internal training including: - three inspections under supervision	Not applicable.

7.2.2 Qualification

Certification staff must be demonstrably qualified by evaluation of education and experience with respect to the above-mentioned requirements. In case qualification takes place on the basis of other criteria, then this has to be recorded in writing. The authority for qualification rests with the management of the certification body.

7.3 Report Product investigation tests

The certification body records the results of the product investigation tests in a dossier. This dossier must fulfil 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.

7.4 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 product investigation tests. The decision shall be recorded traceable.

7.5 Nature and frequency of external inspections

The certification body must enforce inspections at the supplier's site to investigate whether the obligations are met.
The Board of Experts advises about the number of inspection visits. At the time of validation of this evaluation guideline this frequency has been fixed at two inspection visits per year, to be performed at the installer.

Inspections shall invariably include:

- The product specification as stated in the certificate;
- The correct marking of the certified products;
- The compliance with the required procedures.

The findings of the inspection visits performed shall be traceably recorded, by the certification body, in a report.

7.6 Report to the Board of Experts

The certification body reports at least once a year about the conformity judging work performed. In this reporting, the following subjects must be addressed:

- Mutations in number of certificates (new/cancelled);
- Number of inspections carried out in relation to the fixed frequency;
- Results of the inspections;
- Measures imposed in case of non-conformities;
- Complaints received from third parties concerning certified products.

7.7 Interpretation of requirements

The Board of Experts may lay down the interpretation of this evaluation guideline in a separate interpretation document. The certification body is obliged to inform whether an interpretation document is available. If this is the case, then the interpretations as laid down in the interpretation document must be employed.

7.8 Corrective actions (sanctions)

When the certification requirements are not met, measures are taken by the certification body in accordance with the sanctions policy what is published on the certification body service portal in the corresponding BRL.

8 List of mentioned documents

Standard [1)]	Title
CEN-TR 14920:2005	Jetting resistance of drain and sewer pipes - Moving jet test method
DIN 4102-1:1998	Fire behaviour of building materials and elements Part 1: Classification of building materials Requirements and testing
DIN 4060:1998	Joints of sewer and drain pipes with elastomeric seals - Requirements and testing on joints with elastomeric seals
NEN 3215+C1+A1:2018	Drainage system inside and outside buildings - Determination methods for drainage capacity, water and air tightness and distance for roof mounted outlets
NEN-EN 10204:2004	Metallic products - Types of inspection documents
NEN-EN 13501-1:2019	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
NEN-EN-ISO 1183-1:2012	Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method
NEN-EN-ISO 1172:1998	Textile-glass-reinforced plastics - Prepegs, moulding compounds and laminates - Determination of the textile-glass and mineral-filler content - Calcination methods
NEN-EN-ISO 9001:2015	Quality management systems - Requirements
NEN-EN-ISO 11296-1:2018	Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks - Part 1: General
NEN-EN-ISO11296-4:2018	Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks - Part 4: Lining with cured-in-place pipes
NEN-EN-ISO 11357-2:2014	Plastics - Differential scanning calorimetry (DSC) - Part 2: Determination of glass transition temperature and glass transition step height
NEN-EN-ISO 13257:2019	Thermoplastics piping systems for non-pressure applications - Test method for resistance to elevated temperature cycling
NEN-EN-ISO/IEC 17020:2012	Conformity assessment -General criteria for the operation of various types of bodies performing inspection.
NEN-EN-ISO/IEC 17021-1:2015	Conformity assessment - Requirements for bodies providing audit and certification of management systems
NEN-EN-ISO/IEC 17024:2012	Conformity assessment - General requirements for bodies operating certification of persons.
NEN-EN-ISO/IEC 17025:2005+C1:2007	General requirements for the competence of testing and calibration laboratories.
NEN-EN-ISO/IEC 17065:2012	Conformity assessment - Requirements for bodies certifying products, processes and services
1. for dated references the edition cited applies	

I Model IQC-scheme (informative)

<table>
<tr><td><u>IQC-schedule</u>

<u>INTERNAL QUALITY PLAN</u></td><td colspan="2">Manufacturer / supplier :
Production location address :</td><td>Number of appendices:</td></tr>
<tr><td colspan="4"><u>Field(s) of application</u>

<u>According Evaluation guideline(s)</u></td></tr>
<tr><td colspan="2"><u>Number of production shifts:</u></td><td colspan="2" rowspan="3"><u>Quality manual, procedures and working instructions</u>
Is the Quality Management System (QMS) certified according to ISO 9001 [1)]?
If yes, by which certification body:
If yes, is the certification body accredited for the particular scope of certification?

The following procedure for dealing with <u>complaints</u> applies:

In case the QMS is <u>not</u> certified according to ISO 9001:
• Working instructions, test instructions and procedures are documented as follows:
• The following procedure for <u>nonconformity review</u> applies:</td></tr>
<tr><td colspan="2"><u>Quality Control</u>
Total number of employees in QC department :
Number of QC-operators per shift :

If no QC-inspections are carried out during night shifts, state the QC procedure(s)/instruction(s) to be followed: , documented in:</td></tr>
<tr><td colspan="2"><u>Inspection and test records</u>
All records shall be maintained for a minimum of years.</td></tr>
</table>

Specific agreements/comments/explanations	Signature of the manufacturer/supplier: Date :

[1)] In case the QMS is ISO 9001 certified and covers the scope of the product certificate(s), reference to the applicable procedure(s) on the next pages is sufficient and the tables A till F do in principle not have to be further filled-out except for the frequency of tests/inspections (to be approved by CB) in tables B, C and D.

A. Calibration of measuring and test equipment

Applicable procedure(s) nr(s):

Equipment to be calibrated	Calibration aspect	Calibration method	Calibration frequency	Calibration file (name and location)

B. Raw material and additives

Applicable procedure(s) nr(s):

B.1 Receipt

For each delivery of raw material or additives data with respect to dates, producers, types and quantities are recorded as follows:

B.2 Entry control

Type of raw material	Inspection aspect	Inspection method	Inspection frequency	Registration file (name and location)

C. **Batch release tests per machine (including in-process and finished product testing)** Applicable procedure(s) nr(s): Production process(es):				
Type of product	Type of test	Test method	Test frequency	Registration file (name and location)

Specific agreements/comments/explanations:

D.	**Process verification tests** Applicable procedure(s) nr(s):			
Type of product	Type of test	Test method	Test frequency	Registration file (name and location)

E.	**Control of nonconforming and/or rejected products** Applicable procedure(s) nr(s):
E.1	**Method of registration**
E.2	**Method of identification**
E.3	**Method of nonconformity review and disposition**

F.	**Inspection with regard to packaging, storage and transportation of the finished product** Applicable procedure(s) nr(s):		
Inspection aspects	Inspection method	Inspection frequency	Registration file (name and location)
F.1	**Packaging/storage/ transportation etc**		