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EVALUATION GUIDELINE

FOR THE KOMO PRODUCT CERTIFICATE FOR

PIPING AND FITTINGS WITH STRUCTURED (RIDGED) WALLS FOR PLASTICS PIPING FOR NON-PRESSURE UNDERGROUND DRAINAGE AND SEWERAGE - PART 2 - TYPES B: PP, PE

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Determined by the CvD LSK on. …–…–20…

Accepted by the KOMO Testing and Quality Commission on. …–…–20…

Edition: Kiwa Nederland B.V.

Preface

This KOMO Evaluation Guideline (BRL) has been drawn up by the Board of Experts LSK, which counts with representatives from the interested parties on the subject matter of this BRL. This Board also supervises the certification activities based on this BRL and will make any necessary adjustments. All references to the Board of Experts in this BRL pertain to the above mentioned Board of Experts.

This BRL will be used by certification bodies who have a license agreement with the KOMO Foundation in connection with the established certification procedures. This BRL details the requirements an applicant or an existing holder of a KOMO certificate must comply with, and the method employed by the evaluating certification body. The certification procedure established by the certification body includes a description of the working method as employed by the certification body in the implementation of:

- (pre)certification tests required for granting and renewing a KOMO product certificate based on the present BRL;
- periodic assessments for the maintenance of a previously issued product certificate based on the present BRL.

In the BRL the following parts have been changed:

- The entire document has been updated to the new KOMO template 28-7-2021,
- The underlying NEN-EN 13476-1:2007 has been updated to NEN-EN 13476-1:2018,
- The underlying NEN-EN 13476-3:2007+A1:2009 has been updated to NEN-EN 13476-3:2018+A1:2020,
- The underlying CEN/TS 13476-4:2013 has been updated to CEN/TS 13476-4:2019,
- Test matrix (tables 2-5, vs 2021) adapted due to witness testing and clarification requirements to IQS.
- Section 1.2 (vs 2021) has been clarified,
- Section 3 (vs 2021) with regard to CEN/TS 13476-4 has been added,
- Section 3 (vs 2021) with regard to temperatures has been added,
- Table 4.1 – "Connection between performance of the installed system and tested properties" (vs 2017) has been removed,
- Table 6.1 – "Investigation matrix" (vs 2017) has been merged into tables 2-5 (vs 2021),
- Section 4.3.7 Inlets (vs 2017) had been removed,
- Section 3.2.10 Mechanical strength or flexibility and watertightness (vs 2021) has been added,
- Section 3.2.11 Changes (vs 2021) has been added.

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1 Introduction, general provisions, and general requirements

1.1 Introduction

Based on the regulations laid down in this KOMO Evaluation Guideline (BRL) a KOMO product certificate is issued for pipes or fittings with structured walls for non-pressure underground drainage and sewerage. This product certificate enables the certificate holder to prove their clients that an expert, independent organization supervises the certificate holder's production process, the quality of the product and its respective quality control. Thus it may be assumed that the product has the characteristics as established in the present BRL.

The requirements determined in this BRL are used by the certification bodies, which have been accredited as such by the Board of Accreditation, or have presented an application, and who have a license agreement with the KOMO Foundation, employed when processing an application for the issuance and maintenance of a KOMO product certificate for pipes or fittings with structured walls for non-pressure underground drainage and sewerage.

In addition to the requirements laid down in this BRL, certification bodies impose additional requirements in the sense of general procedure requirements for certification, as established in their internal certification procedures.

1.2 Subject matter and area of application

The pipes and fittings made from PP or PE, with smooth internal and profiled external surfaces, designated as Type B, will be used in non-pressure underground drainage and sewerage.

The temperature profile the pipes and fittings must withstand can be found in EN 476 chapter 6.5.

This evaluation guideline only includes the UD application for the diameters from 110 mm up to and including 200 mm, with their respective requirements as laid down in NEN-EN 13476-3; the U-design for this diameter group is not included in this evaluation guideline.

Products to be used in accordance UD applications are suitable for loading with warm water in combination with ground forces.

Description of the application codes

U: (underground) the area for underground products located at a distance of more than one meter from the building;

D: (drainage) the area for underground products within the building structure and up to a meter within the range of influence of the building; affected by ground forces and drainage of warm water.

UD: the area includes zones U and D.

1.3 Validity

This revision of the BRL replaces the version dated 30-08-2017.

All KOMO product certificates that have been issued based on that version of the BRL will expire/will remain in effect in any case on «datum (1 jaar na vaststelling)».

Based on the aforementioned previous version of this BRL, existing certificates may be issued at the very latest 3 months before the current product certificate must be replaced.

The KOMO product certificate is does not expire.

Validity may be limited (terminated), among other reasons, because of:

- A modification of this evaluation guideline,
- Incompliance the certificate holder's obligations.

1.4 Relation with European Construction Products Regulation (No. CPR, EU 305/2011)

There is no harmonized European norm applicable to the products referred to in this BRL.

1.5 Requirements to be imposed on conformity assessing institutions

With regard to the requirements laid down in this evaluation guideline, the applicant may submit, in the scope of external inspections, reports issued by conformity assessing institutions to prove that the requirements of this BRL are being satisfied. It must be demonstrated that the respective analysis/inspection/test and/or evaluation reports have been drawn up by a body that complies with the respective applicable accreditation norm with regard to the subject matter,

- NEN-EN-ISO/IEC 17020 inspection institutions;

- NEN-EN-ISO/IEC 17021-1 institutions that certify management systems;
- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17065 for institutions certifying products, processes, and service.

An organization will be considered as compliant with these criteria if an accreditation certificate for the respective subject matter can be submitted, issued by the Board of Accreditation (RvA) or another accreditation organization which has been accepted as a member of a multilateral agreement on the subject of mutual recognition and acceptance of accreditation, which have been drawn up within the EA, IAF and ILAC. If no accreditation certificate can be submitted, the certification organization itself will assess if compliance is given to the accreditation criteria.

1.6 KOMO product certificate

KOMO product certificates will be issued based on this BRL. Statements included in these product certificates are based on chapters, 3, 4 and 5 of this BRL.

Product certificates may be issued for the following type of products:

- PP Pipe type B, in accordance with chapter 3, table 2 and chapter 4,
- PE Pipe type B, in accordance with chapter 3, table 3 and chapter 4,
- PP Fitting for type B pipe, in accordance with chapter 3, table 4 and chapter 4,
- PE Fitting for type B pipe, in accordance with chapter 3, table 5 and chapter 4.

The product certificate to be issued must be in accordance with the model product certificate as published for this version of the BRL on the KOMO website (www.komo.nl).

1.7 Markings and specifications

The following shall be indelible applied to the products:

- KOMO logotype or KOMO word mark followed by the certificate number without specifying the version,
- Manufacturer's name or trademark*,
- Specification of material*,
- Specification of category,
- Nominal external diameter,
- Production period or production code.

Pipes shall be marked at intervals of maximum 2 m, at least once per pipe.

Additional marking for fittings:

- Nominal measurements based on the nominal external diameter of the matching pipe,
- Angle of the fitting, if applicable.

Optional marking:

- BRL 9208-2.

* If there is little space available on the products, these marks may be affixed to the smallest packaging unit.

The KOMO logo type must be applied as follows:

The KOMO word mark must be applied as follows:

KOMO®

Furthermore a QR mark may be applied which remits to the information of the respective product certificate on the KOMO website.

After issuance of the KOMO product certificate this KOMO logo/KOMO word mark may be also used by the certificate holder in public communications with regard to their certified activities, as specified in the "Rules and Regulations for the use of the KOMO marks" as published on the KOMO website.

2 Terminology

For an explanation of the terminology used in this evaluation guideline for certification, please go the glossary on the website of the KOMO Foundation (www.komo.nl).

2.1 General terminology and definitions

Specific terms and definitions related to the product see NEN-EN 13476-3 chapter 3.

- **Supplier**
  The party who is responsible for ensuring that products continuously meet the requirements the certification is based on;
- **IQC scheme**
  A description of the quality controls performed by the provider as part of their quality system;
- **Type A wall construction**
  A pipe or fitting with external and internal smooth surfaces. The internal and external coatings are connected through a foam or non-foam intermediate layer (not applicable to this BRL; only applicable to part 1 of this BRL);
- **Type B wall construction**
  A pipe or fitting with a smooth internal surface and a corrugated external surface (applicable to this BRL);
- **Internal or own rework materials**
  Materials coming from rejected and unused pipes and fittings or trial productions, whose compound is known, intended to be reused in the same production location it was manufactured. The own rework material must not be contaminated.
- **External rework material**
  Material coming from rejected and unused products* or trial productions, whose specifications are known, intended to be re-used in a production location different from the manufacturing location where it has been produced. The external rework material must not be contaminated;
- **Recycled material**
  Thermoplastic material coming from used products* that have been cleaned and granulated. This could be:
  - material from used pipes and fittings;
  - material from used products other than pipes and fittings.
    * pipes or fittings or other
- **Materials**
  Please refer to the description of materials in NPR-CEN/TS 14541.
  - Note: for a detailed description about the use of mentioned materials, please refer to attachments D and F of NEN-EN 13476-3 and (diverting from it) 4.3.1 of this evaluation guideline.

2.2 Abbreviations

CI	Certification Body
DN	nominal dimension
DN/OD	nominal dimension related to external diameter

3 Requirements the product must meet

This chapter includes the requirements a product must meet, converted to the product characteristics of pipes and fittings made of PP or PE with structured walls (type B), as well as the determination methods and the limit values to determine that these requirements are being met.

The tests are performed per product type and per size group as described in CEN/TS 13476-4, where the frequency can be adjusted according to footnote 3 under table 5.

Measurement inaccuracies have been taken into account when determining the requirements. Therefore they no longer need to be considered when drawing conclusions about whether or not the requirements are being met.

Temperatures between 15 °C and 30 °C are permitted for tests performed at the production site. In case of dispute (23 ± 2) °C is used.

3.1 Product characteristics

The requirements for the product are laid down in:

- NEN-EN 13476-1 “Plastics piping systems for non-pressure underground drainage and sewerage - Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 1:General requirements and performance characteristics”,
- NEN-EN 13476-3 “Plastics piping systems for non-pressure underground drainage and sewerage - Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B”,
- Section 3.2 Additional and deviating properties.

Summarized in tables:

- table 2: Test matrix PP pipes type B,
- table 3: Test matrix PP fittings,
- table 4: Test matrix PE pipes type B,
- table 5: Test matrix PE fittings.

3.2 Additional and deviating properties

3.2.1 Re-use of material

3.2.1.1 Use of own re-processable material

The use of cleaned own re-processable material in accordance with the conditions described in D.1 and F.1 of NEN-EN 13476-3 is allowed without limitations.

3.2.1.2 Use of external re-processable and recyclable material

The use of this material is determined by the manufacturer and will be verified by the certification body by means of the manufacturer's IQC scheme. For this purpose the manufacturer will demonstrably record the following:

- traceability of the supplier(s) of this material;
- specification of the material in accordance with attachments D and F of NEN-EN 13476-3;
- quantity of non-virgin material used (traceable);
- testing reports of tests performed by the manufacturer on this material.

3.2.2 Color of piping and fittings

The external color is grey (RAL 7037), orange-brown (RAL 8023) or black.

3.2.3 Rubber or TPE sealing elements

Rubber sealing rings must comply with BRL 2013 and TPE rings with BRL 2020-2.

3.2.4 Stiffness nominal classes (SN) classes for piping and fittings SN classes

Considering the type of soil in the Netherlands and NEN-EN 1610, only the following (minimum) classes are permitted. Initial stiffness of the ring of Type B piping and the stem of the fittings established in accordance with NEN-EN-ISO 9969 is higher than or equal to **8** kN/m^2.

3.2.5 Insertion depth

For diameters from 110 mm to 200 mm the insertion depths must be in accordance with type M of table 13 of NEN-EN 1329-1, see table 2. This applies to pipe molded sockets and fitting insertion depth.

Table 1 - Minimum insertion depth

d_e (mm)	Insertion depth A_{min} (mm)
110	40
125	43
160	50
200	58

3.2.6 Bending test

Pipes and fittings must be resistant to real life circumstances in the Netherlands and exerted influences on them. Corresponding guidelines have been laid down in NEN-EN 1610. The must satisfy the requirements in accordance with NEN 7146 “Bending test for thermoplastic materials”.

3.2.7 Fixation of sealing rings

Every sealing ring must be soundly secured in the socket. Fixation must be in such a way that it is resistant against expected real life forces when sliding the pipes in or out. The socket will be deemed to satisfy this requirement, when, upon performing the following test:

a. fixation of the ring is not broken;

b. this ring does not stretch in such a way that it surpasses the space (which the rings must seal).

Testing method: fixation

Evaluation of fixation takes place by sliding a pipe into the socket.

The tube end that enters into the socket must not be beveled. Upon sliding the pipe into the socket no measures must be taken with regard to placing it in the center. Both tests must be performed in a method that simulates real life circumstances, with a crowbar or similar. Slide in speed must also be equal to usual real life installation speed.

No lubricant must be applied to the tube end nor the sealing ring. If upon performing this test the sealing element is forced out of the groove, it will be assumed that fixation does not satisfy the requirement.

If the sealing rings remains in place, but the pipe cannot be slidden into the socket with normal force, a second test must be performed. When performing the second test, a small amount of lubricant may be applied to the spigot end of the pipe.

To be able to satisfy the requirement, afterwards it must be possible to slide the pipe into the socket respectively it must be possible to slide the socket onto the pipe, in such a way that the sealing ring is not pushed out of the groove.

To verify location of the seal after the first as well as the second test, the socket must be sawn immediately behind the confinement space.

3.2.8 Aging caused by ultraviolet radiation (UV) when dealing with PP; does not apply to black PP tube

Tensile strength after exposition to a Xenon-arc lamp

After exposition of the test pieces to a Xenon-arc lamp in accordance with the following exposition test, the average tensile strength of the exposed piping material must not be inferior to 75% of the average tensile strength of the non-exposed piping material. The tensile strength must be determined in accordance with NEN-EN-ISO 8256.

Exposition may also take place using so called outdoor exposition. Exposition must start in the month of April and finalized after the products have received a global radiation dose of 2 GJ/m² . In case of doubt, the outdoor exposition will be normative.

Testing method: exposition test

Determine the tensile strength of the adequate test pieces, which will be exposed in a piece of equipment in accordance with NEN-EN-ISO 4892 part 2 and in testing circumstances as stipulated in this norm in table 3, cycle number 1 (method A: exposition with the help of day light filters – simulation of outdoor exposition).

Exposition time in the equipment must be calculated on basis of the required global radiation dose and in accordance with EOTA TR 010, attachment C.

In this case the required exposition time is:

$$t = \frac{E}{I} = \frac{E_{sun} \times 0{,}06 \times 0{,}67}{I} = \frac{2 \times 10^9 \times 0{,}06 \times 0{,}67}{60} = 1{,}34 \times 10^6 \ (seconds)$$

t = 372 hours.

where:
E_{sun} represents the equivalent global radiation dose for outdoor exposition; and

I represents the intensity of the light source measured by the equipment between 300 and 400 nm.

Note 1
The calculation method describe above for the duration of the exposition represents a very global method of calculating, but it does provide a certain logical base when taking into consideration that natural weathering itself is a very variable phenomenon that depends on location, aspect, shelter, etc.

Test pieces

A length of smooth walled pipe of approx. 1 meter is required for this test. The thickness of the pipe must preferably be (3 ± 0,2) mm or (4 ± 0,2) mm and the diameter at least 110 mm. From this pipe 12 test pieces will be cut according to type 3 of NEN-EN-ISO 8256. Six of the test pieces must be exposed. The length direction of the test pieces must coincide with the extrusion direction of the pipe. The end of the test pieces that correspond to the outside of the pipe will be aimed at the light source during the exposition test.

3.2.9 Elevated temperature cycling test and air resistance

The elevated temperature cycling test will be performed in accordance with NEN 7039. There are 1500 cycles with a minimum temperature of 15 °C is and a maximum of 93 °C.

Requirement: there shall be no leakage or clear deformations during and after the test. .

Note: this test is only applicable to diameters from 110 to 200 mm. Structured pipes will practically be used exclusively outdoors. Therefore this test is particularly applicable to fittings with smooth walls that are suitable for use within the range of influence of a building. These fittings will most probably 'be covered' by other NEN-EN norms.

Before and after the elevated temperature cycling test, the assembled system must be tested with air applying an overpressure of 4 kPa for 5 minutes. During these 5 minutes the overpressure may not decrease beyond a value of 2,75 kPa. If this is not met, in a time frame of 15 minutes the overpressure may not have decreased beyond a value of 2,5 kPa.

Note: 100 kPa is equal to 1 bar

3.2.10 Mechanical strength or flexibility and watertightness

In deviation to CEN/TS 13476-4, the frequency for the manufacturer is set at 1x per batch.

3.2.11 Changes

After a significant change to the product or the production process, it is necessary to determine whether the products still meet the properties. The supplier must notify the certification body in writing of all intended significant changes. The certification body determines what constitutes a significant change. After it has been established that the products with the proposed change comply with the properties of this BRL, the change can be implemented in the supplier's production process.

The following is used as a guideline for product changes: CEN/TS 13476-4

Table 2: Test matrix PP pipes type B

BRL 9208-2	NEN-EN 13476-1	NEN-EN 13476-3	Description characteristic	Research in the context of [1, 2]: Type Testing	Audit tests	IQS[3] Performed by manufacturer: At start up	Frequency
Material							
3.1		4.3.1	Compound / Formulation PP material	x	1 per year	-	1 per batch
3.1		4.3.2	Resistance to internal pressure	x	1 per 3 years	-	1 per year When using recyclate every 6 months
3.1		4.3.2	Melt mass-flow rate (MFR)	x	1 per year	-	-
3.1		4.3.2	Thermal stability (OIT)	x	1 per year	-	-
3.2.1	4.2	4.3.4	Utilization of non-virgin materials	x	1 per year	-	1 per year
Designation of wall constructions and examples of typical jointing methods							
3.1	5	5.1	Wall constructions designated as Type B	x	-	-	1 per year
Appearance and colour							
3.1	6.1	6	Appearance	x	1 per year	x	1 per 8 h
3.2.2	6.2	6	Colour	x	1 per year	x	1 per 8 h
Geometrical characteristics							
3.1 + 3.2.5		7.2	Dimensions	x	1 per year	x	1 per 8 h For dimensions which are influenced by the process
Physical characteristics							
3.1		8.2	Resistance to heating - Oven test	x	1 per year	x	1 per week
Mechanical characteristics							
3.1 + 3.2.4		9.1.1	Ring stiffness	x	1 per year	x	-
3.1		9.1.1	Impact strength	x	1 per year	x	1 per week
3.1		9.1.1	Ring flexibility	x	1 per year	x	-
3.1		9.1.1	Creep ratio Not applicable for pipes greater than DN/ID or DN/OD 1200.	x	1 per year	-	-
Performance/System tests							
3.1		10	Tightness of elastomeric ring seal joint	x	1 per year	-	1 per 2 years
3.2.9		10	Resistance to combined temp. cycling and external loading	-	-	-	-
3.2.9		10	Elevated temperature cycling	-	-	-	-
Marking							
1.7	10	11	Marking	x	1 per year	x	1 per 8h
BRL specific							
3.2.6		-	Bending test	x	1 per year	-	1 per year
3.2.8		-	Aging (UV) Not for black products	x	PP-C: 1x per 4 years PP-H: 1x per year	-	-
3.2.9		-	Cyclic temperature test and airtightness 110mm <DN< 200mm	x	1 per 2 years	-	1 per 3 years
Additional for Spirally formed pipe							
3.1		4.1	Spirally formed pipe constructions	x	-	-	1 per year
3.1		9.1.1	Tensile strength of seam	x	1 per year	x	-
Additional for Integral sockets							
3.2.3	4.4	4.5	Sealing rings	x	1 per year		1 per batch
3.2.7		-	fixing sealing rings	x			1 per year
Additional for jointing by fusion/welding							
3.1	4.5	4.6	Manufacturer's instructions for the jointing process	x	-	-	1 per year
3.1		10	Tensile test of welded or fused joints	x	1 per year	-	1 per 2 years

Table 3: Test matrix PP fittings

BRL 9208-2	NEN-EN 13476-1	NEN-EN 13476-3	Description characteristic	Research in the context of [1, 2]: Type Testing	Audit tests	IQS[3] Performed by manufacturer: At start up	Frequency
Material							
3.1		4.3.1	Compound / Formulation PP material	x	1 per year	-	1 per batch
3.1		4.3.2	Resistance to internal pressure	x	1 per 3 years	-	1 per year When using recyclate every 6 months
3.1		4.3.2	Melt mass-flow rate (MFR)	x	1 per year	-	-
3.1		4.3.2	Thermal stability (OIT)	x	1 per year	-	-
3.2.1	4.2	4.3.4	Utilization of non-virgin materials	x	1 per year	-	1 per year
General							
3.2.3	4.4	4.5	Sealing rings	x	1 per year		1 per batch
3.1	6.1	6	Appearance	x	1 per year	x	1 per 8 h
3.2.2	6.2	6	Colour	x	1 per year	x	1 per 8 h
Geometrical characteristics							
3.1 + 3.2.5		7.2	Dimensions	x	1 per year	x	1 per 8 h For dimensions which are influenced by the process
Physical characteristics							
3.1		8.2.2	Effect of heating	x	1 per year	-	1 per year
Mechanical characteristics							
3.2.4		9.2	Stiffness	x	1 per 2 years	-	-
3.1		9.2	Impact strength -Drop test	x	1 per year	-	-
Performance/System tests							
3.1		10	Tightness of elastomeric ring seal joint	x	1 per 2 years		1 per 2 years
Marking							
1.7	10	11	Marking	x	1 per 8h	x	1 per 8h
BRL specific							
3.2.6		-	Bending test	x	1 per year	-	1 per year
3.2.7		-	fixing sealing rings	x	-		1 per year
3.2.8		-	Aging (UV) Not for black products	x	PP-C: 1x per 4 years PP-H: 1x per year	-	-
3.2.9		-	Cyclic temperature test and airtightness 110mm <DN< 200mm	x	1 per 2 years		1 per 3 years
Additional for fabricated fittings							
3.2.10		9.2	Mechanical strength or flexibility	x	1 per year		1 per batch
3.2.10		10	Watertightness	x	1 per year		1 per batch
Additional for jointing by fusion/welding							
3.1	4.5	4.6	Manufacturer's instructions for the jointing process	x	-	-	1 per year
3.1		10	Tensile test of welded or fused joints	x	1 per year	-	1 per 2 years

Table 4: Test matrix PE pipes type B

BRL 9208-2	NEN-EN 13476-1	NEN-EN 13476-3	Description characteristic	Research in the context of [1, 2]: Type Testing	Audit tests	IQS[3] Performed by manufacturer: At start up	Frequency
Material							
3.1		4.4.1	Compound / Formulation PE material	x	1 per year	-	1 per batch
3.1		4.4.2	Resistance to internal pressure	x	1 per 3 years	-	1 per year When using recyclate every 6 months
3.1		4.4.2	Melt mass-flow rate (MFR)	x	1 per year	-	-
3.1		4.4.2	Thermal stability (OIT)	x	1 per year	-	-
3.1		4.4.2	Density	x	1 per year	-	-
3.2.1	4.2	4.4.4	Utilization of non-virgin materials	x	1 per year	-	1 per year
Designation of wall constructions and examples of typical jointing methods							
3.1	5	5.1	Wall constructions designated as Type B	x	-	-	1 per year
Appearance and colour							
3.1	6.1	6	Appearance	x	1 per year	x	1 per 8 h
3.2.2	6.2	6	Colour	x	1 per year	x	1 per 8 h
Geometrical characteristics							
3.1 + 3.2.5		7.2	Dimensions	x	1 per year	x	1 per 8 h For dimensions which are influenced by the process
Physical characteristics							
3.1		8.3.1	Resistance to heating - Oven test	x	1 per year	x	1 per week
Mechanical characteristics							
3.1 + 3.2.4		9.1.1	Ring stiffness	x	1 per year	x	-
3.1		9.1.1	Impact strength	x	1 per year	x	1 per week
3.1		9.1.1	Ring flexibility	x	1 per year	x	-
3.1		9.1.1	Creep ratio Not applicable for pipes greater than DN/ID or DN/OD 1200.	x	1 per year	-	-
Performance/System tests							
3.1		10	Tightness of elastomeric ring seal joint	x	1 per year	-	1 per 2 years
3.2.9		10	Resistance to combined temp. cycling and external loading	-	-	-	-
3.2.9		10	Elevated temperature cycling	-	-	-	-
Marking							
1.7	10	11	Marking	x	1 per year	x	1 per 8h
BRL specific							
3.2.6		-	Bending test	x	1 per year	-	1 per year
3.2.8		-	Aging (UV) Not for black products	x	PP-C: 1x per 4 years PP-H: 1x per year	-	-
3.2.9		-	Cyclic temperature test and airtightness 110mm <DN< 200mm	x	1 per 2 years	-	1 per 3 years
Additional for Spirally formed pipe							
3.1		4.1	Spirally formed pipe constructions	x	-	-	1 per year
3.1		9.1.1	Tensile strength of seam	x	1 per year	x	-
Additional for Integral sockets							
3.1 + 3.2.3	4.4	4.4.5 + 4.5	Sealing rings	x	1 per year	-	1 per batch
3.2.7		-	fixing sealing rings	x	-	-	1 per year
Additional for jointing by fusion/welding							
3.1	4.5	4.6	Manufacturer's instructions for the jointing process	x	-	-	1 per year
3.1		10	Tensile test of welded or fused joints	x	1 per year	-	1 per 2 years

Table 5: Test matrix PE fittings

BRL 9208-2	NEN-EN 13476-1	NEN-EN 13476-3	Description characteristic	Research in the context of [1, 2]: Type Testing	Audit tests	IQS[3] Performed by manufacturer: At start up	Frequency
Material							
3.1		4.4.1	Compound / Formulation PP material	x	1 per year	-	1 per batch
3.1		4.4.2	Resistance to internal pressure	x	1 per 3 years	-	1 per year When using recyclate every 6 months
3.1		4.4.2	Melt mass-flow rate (MFR)	x	1 per year	-	-
3.1		4.4.2	Thermal stability (OIT)	x	1 per year	-	-
3.1		4.4.2	Density	x	1 per year	-	-
3.2.1	4.2	4.4.4	Utilization of non-virgin materials	x	1 per year	-	1 per year
General							
3.1 + 3.2.3	4.4	4.4.5 + 4.5	Sealing rings	x	1 per year		1 per batch
3.1	6.1	6	Appearance	x	1 per year	x	1 per 8 h
3.2.2	6.2	6	Colour	x	1 per year	x	1 per 8 h
Geometrical characteristics							
3.1 + 3.2.5		7.2	Dimensions	x	1 per year	x	1 per 8 h For dimensions which are influenced by the process
Physical characteristics							
3.1		8.2.2	Effect of heating	x	1 per year	-	1 per year
Mechanical characteristics							
3.2.4		9.2	Stiffness	x	1 per 2 years	-	-
3.1		9.2	Impact strength -Drop test	x	1 per year	-	-
Performance/System tests							
3.1		10	Tightness of elastomeric ring seal joint	x	1 per 2 years	-	1 per 2 years
Marking							
1.7	10	11	Marking	x	1 per 8h	x	1 per 8h
BRL specific							
3.2.6		-	Bending test	x	1 per year	-	1 per year
3.2.7		-	fixing sealing rings	x	-		1 per year
3.2.8		-	Aging (UV) Not for black products	x	PP-C: 1x per 4 years PP-H: 1x per year	-	-
3.2.9		-	Cyclic temperature test and airtightness 110mm <DN< 200mm	x	1 per 2 years	-	1 per 3 years
Additional for fabricated fittings							
3.2.10		9.2	Mechanical strength or flexibility	x	1 per year	-	1 per batch
3.2.10		10	Watertightness	x	1 per year	-	1 per batch
Additional for jointing by fusion/welding							
3.1	4.5	4.6	Manufacturer's instructions for the jointing process	x	-	-	1 per year
3.1		10	Tensile test of welded or fused joints	x	1 per year	-	1 per 2 years

Notes on Tables 2 till 5:

1. During the inspection visit, the inspector will check the product on the basis of a selection of the above-mentioned product properties. The frequency of inspection visits is laid down in Article 5.3 Type and frequency of periodic inspections
2. If, for whatever reason, it is not possible to perform a test in a specific for that activity ISO/IEC 17025 accredited and impartial laboratory, than, in consultation with the CI, to perform the test under 'witness'. The ‘witness’ must be carried out at a laboratory that is ISO/IEC 17025 certified;
3. The frequency can be adjusted in accordance with the CI, e.g.:

   a. in the case of a continuous (automated) measurement;

   b. if it can be demonstrated that a reduction in frequency does not affect quality.

4 Requirements for certificate holders and internal quality control

4.1 General

The management of the certificate holder is responsible at all times for the quality of the production process, internal quality control, and the quality of the product. The internal quality control must meet the requirements laid down in this chapter.

4.2 Internal quality control

The certificate holder must have an internal quality control scheme used by them (IQC-scheme).

This scheme must clearly establish:

- Which aspects are subject to inspections carried out by the organization of the certificate holder or an external organization contracted by them,
- Which methods are employed to carry out these inspections,
- The frequency of these inspections,
- If and if affirmative, the inspection results are recorded.

The IQC-scheme must at least include the following main groups:

- Inspection of measuring equipment,
- Entrance inspection,
- Process inspection,
- Product inspection,
- Internal transportation and storage,
- Delivery,
- Procedures for:
  - The handling of products with deviations,
  - Processing of claims,
  - Processing of deviations and follow-up of corrective measures,
  - Controlling the work instructions and control forms used.

This IQC-scheme must be based on the IQC-scheme model, which is published on the website of the scheme manager, and detailed in such a way that the CI generates sufficient confidence that the requirements laid down in this this evaluation guideline are being continuously satisfied.

Internal quality control must enable the certificate holder to demonstrate that the requirements laid down in this evaluation guideline are being continuously satisfied.

4.2.1 Control measuring equipment

The supplier must determine which laboratory and measuring equipment is required on the basis of this BRL to demonstrate that the product meets the requirements. When necessary, the laboratory and measuring equipment should be calibrated at specified intervals.

The supplier must assess and record the validity of the previous measurement results if the calibration shows that the laboratory and measuring equipment is not functioning correctly.

The relevant measuring equipment must be provided with an identification with which the calibration status can be determined.

The supplier must register the results of the calibrations.

5 External conformity assessments

5.1 General

The certification body will carry out a pre-certification for the purpose of granting a KOMO product certificate. After issuance of the KOMO product certificate, the certification body will carry out periodic inspections.

5.2 Pre-certification test

The applicant of the product certificate will specify which products they want to be included in the product certificate to be issued. The applicant will provide all relevant information on these products for the formulation of the product specification and the declaration on the product characteristics, as they will be included in the product certificate to be issued.

The certification body will perform a pre-certification test for the purpose of issuing a product certificate in which

- The certification body will assess if the applicant is able, by means of their internal quality control, to guarantee that the products will continuously have the characteristics, respectively perform as established in chapter 3 of this BRL. Assessment of the production process and the finished product are part of this.
- The certification body will assess if the operational system of the internal quality control meets the requirements laid down in chapter 4 of this BRL,
- The certification body assesses the processing instructions, application conditions and maintenance instructions,
- Determination of the product characteristics (of the fabricated products) as included in this BRL.

If applicable, it will be verified if the submitted documents with regard to the product and/or the internal quality control and the results specified in those documents, meet the requirements of this evaluation guideline.

A report will be made on the pre-certification test, based on which the product certificate may or may not be granted.

5.3 Type and frequency of periodic inspections

After issuing the product certificate, the certification body must carry out periodic inspections at the certificate holders' to verify compliance with their obligations. The College of Experts will decide the type, scope, and frequency of the periodic inspections.

At the time this evaluation guidelines is entering into effect, the frequency has been determined on 4 annual periodic inspections.

If the supplier has a certified NEN-EN-ISO 9001 system, the frequency is set at 2 annual periodic inspections.

The audit program includes the type and frequency of the period inspections. These are related to:

- The certificate holder's IQC-scheme,
- The results of the inspections performed by the certificate holder,
- Measurements during the production process,
- Measurements of/to the final product,
- The correct method of marking of the certified products,
- Compliance with the required procedures,

and compliance of the requirements laid down in this evaluation guideline is verified.

The audit program is included in this BRL as part of Tables 2 to 5.

The results of each assessment carried out, will be recorded in a traceable manner in a report by the certification body.

5.4 Shortcomings

The weighting and follow-up of shortcomings and the sanctions policy are laid down in an interpretation document accompanying this assessment guideline, which is published on the website of the scheme manager.

5.5 Suspension of product certificate

In the event that (temporarily) no products are produced and/or delivered, in the event of a stop longer than 6 months, the validity of his KOMO product certificate can be (temporarily) suspended at the request of the certificate holder. Such suspension may be granted by the certification body for a maximum of 3 year in total.

After the suspension has been granted, a certificate holder can request that his suspension be terminated earlier.

In the event of a suspension period longer than 3 years or less, prior to the resumption of production and delivery under a product certificate, an additional assessment must be carried out to determine whether all the requirements in this assessment guideline are still met and the suspended status can be converted to a valid status.

This also applies when there is temporarily no production or delivery.

6 Requirements for the certification body

6.1 General

The certification body must have a procedure that establishes the general rules employed for certification processes.

De certificatie-instelling moet voor het onderwerp van deze BRL op basis van NEN-EN-ISO/IEC 17065 zijn geaccrediteerd door de Raad voor Accreditatie en die een licentieovereenkomst hebben met de Stichting KOMO.

The certification body must have regulations, or an equivalent document, in which the general rules that are used for certification are laid down. In particular these are:

- The general rules for conducting the entrance examination, to be distinguished according to:
  - The way in which suppliers are informed about the processing of an application;
  - The execution of the investigation;
  - The decision as a result of the conducted investigation;
- The general rules with regard to the performance of checks and the control aspects involved;
- The measures to be taken by the certification body in the event of shortcomings;
- The measures to be taken by the certification body in the event of improper use of certificates, certification mark, pictograms and logos;
- The rules on termination of a certificate;
- The possibility to lodge an appeal against decisions or measures of the certification body.

6.2 Certification staff

Certification staff involved can be divided as follows:

- Certification assessor/Reviewer: in charge of preparing the design and documentation assessments, assessment of applications, and review of the conformity assessments,
- Location assessor: in charge of external conformity assessments at the certificate holders' location,
- Decision maker: in charge of making decisions with regard to pre-certification tests carried out and about continuity of certification based on performed inspections.

6.2.1 Competency criteria for certification staff

Qualification requirements for the certification staff consist of qualification requirements for the staff executing the certification activities as laid down in the following table. The competency of the involver certification staff must be demonstrably established.

Competencies	**Certification assessor Reviewer**	**Location assessor**	**Decision maker**
Basis competencies			
• Knowledge of business processes • Be able to assess professionally	• HBO thinking and working level • 1 year1of relevant experience	• MBO thinking and working level • 2 years of relevant experience	• HBO thinking and working level • 5 years of relevant experience of which at least 1 year in certification activities
Auditing competencies	N/A.	• Training in auditing competencies • Participation in at least 3 of periodic visits, with a minimum of 1 of periodic visits carried out independently under supervision	N/A
Technical competencies			
Relevant knowledge of: • The technology for the manufacture of the products to be inspected, the execution of the processes and the providing of services • The way products are applied, processes carried out and services provided.	Knowledge of one of the following disciplines: • Relevant Techn. HBO work and thinking level • Minimum of 1 year of experience in production, testing, inspection and/or installation, including:	Knowledge of one of the following disciplines: • Tech. MBO work and thinking level • Minimum of 1 year of experience in production, testing, inspection and/or installation, including:	N/A

• Existing defects that appear when using the product, during the execution of the processes as well as shortcomings in provision of services.	- 2x inspections under supervision • Or internal training program including: - 2x inspections under supervision	- 3x inspections under supervision - 1x independent inspection • Or internal training program including: - 3x inspections under supervision - 1x independent inspection	
Specific technical competencies	Specific knowledge of BRL at a detailed level on the specific BRL or on BRLs that are related to each other	Specific knowledge of: • witness inspection • the BRL chapters related to the quality system and testing	N/A

6.2.2 Qualification certification personnel

Qualification personnel must be demonstrably qualified by testing their knowledge and skills against the abovementioned requirements. If qualification takes place based on other criteria, this must be put down in writing.

The authority with regard to qualification must be established in the quality system of the certification body.

6.3 Communications about the pre-certification test and periodic inspections

The certification body will record the results of the pre-certification tests and periodic inspections in an unequivocal report. Such report must satisfy the following requirements:

- ***Completeness***: the report will include a substantiated report of the determined grade of conformity with regard to the requirements laid down in this evaluation guideline,
- ***Traceability***: the results on which statements are based must be recorded in a traceable way.

6.4 Decisions about the KOMO product certificate

The decision to grant a product certificate or imposing measures with regard to the product certificate must be based on the results laid down in the file.

The results of a pre-certification test and a periodic inspection (in case of a critical shortcoming) must be assessed by a reviewer.

Based on the review carried out, the decision maker will determine if:

- The product certificate can be granted,
- Sanctions must be imposed,
- The product certificate must be suspended or canceled.

The reviewer and the decision makers must not have been involved in the process of preparing the results, based on which the decision is being made.

The decision must be recorded in a traceable manner.

6.5 Reporting to the Board of Experts

The certification body will annually present a report to the Board of Experts about the activities carried out and the respective results with regard to the product certificates based on this evaluation guideline. This report must include at least the following matters::

- The number of inspections performed versus the determined frequency,
- The number of performed pre-certification tests,
- Results of assessments,
- Measures imposed in case of detected shortcomings,
- Complaints received from third parties about certified products.

6.6 Interpretation of requirements

The Board of Experts may establish the interpretation of the requirements of this evaluation guideline in one or more separate interpretation document(s). Interpretation documents are available for/from members of the CvD, certification bodies and the certificate holders who carry out activities based on this evaluation guideline.

Interpretation documents are published on the website of the plan administrator.

Every certification body that makes use of this evaluation guideline is under the obligation to employ the interpretations laid down in it.

7 List of documents

7.1 Public law and Rules and Regulations

There are no applicable public laws and rules and regulations.

7.2 Normative documents

This evaluation guideline remits to the following normative documents:

CPR EU 305/2011	European Construction Products Regulation
EOTA TR 010:2004	Exposure procedure for artificial weathering
BRL 2013: 12-10-2016 A1: 10-10-2018	Rubber rings and flange gaskets
BRL 2020-2: 25-10-2016	TPE pipe joint seals for non-pressure wastewater: Part 2: Seals
NEN-EN 476:2011	General requirements for components used in drains and sewers
NEN-EN 1329-1:2014	Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Unplasticized poly(vinyl chloride) (PVC-U) Part 1: Specifications for pipes, fittings and the system
NEN-EN 1610:2015	Construction and testing of drains and sewers outside buildings
NEN-EN-ISO 4892-2:2013	Plastics - Methods of exposure to laboratory light sources Part 2: Xenon-arc lamps
NEN 7039:2003	Plastics pipes and fittings for soil and wastewater purposes - Elevated temperature cycling test - Test method for air tightness
NEN 7146:2001	Plastics piping systems - Bending test for thermoplastics fittings - Test method and specifications
NEN-EN-ISO 8256:2004	Plastics – Determination of tensile impact strength
NEN-EN-ISO 9001:2015	Quality Management Systems - Requirements
NEN-EN-ISO 9969:2016	Thermoplastics pipes - Determination of ring stiffness
NEN-EN 13476 - Part 1:2018 - Part 3:2018 + A1:2020	Plastics piping systems for non-pressure underground drainage and sewerage - Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 1: General requirements and performance characteristics – Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B
NPR-CEN/TS 14541:2013	Plastics pipes and fittings - Characteristics for utilization of non-virgin PVC-U, PP and PE materials - additional element

Remarks:

Verification if normative documents are still up-to-date is carried out annually. Modifications of the applicable normative documents will be published on the services page on the website of the certification body which draw up the evaluation guideline.

7.3 Informative documents

This evaluation guidelines remits to the following documents for information purposes:

CEN/TS 13476-4:2019	Plastics piping systems for non-pressure underground drainage and sewerage - Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 4: Assessment of conformity