

WATER DISTRIBUTION OR DRAINAGE PIPES**Technical document****08-05 Traditional**

Heating and/or domestic distribution
and/or distribution of chilled water –
Water drainage pipes made of
polyethylene

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The English version is provided for information. In case of doubt or dispute, the French version only is valid.

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MODIFICATION HISTORY

Revision No.	Application date	Modifications
00	16/11/2018	Update to the document layout and reference Content modifications: Creation of technical document following transition of the products covered by this document to traditional status

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The requirements and provisions specified in this Technical Document will be updated in the case of new components or products.

1. STANDARDS

1.1. Product standards

NF EN 1519-1 April 2000: Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Polyethylene (PE) - Part 1: Specifications for pipes, fittings and the system.

XP CEN/TS 1519-2 August 2012: Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Polyethylene (PE) - Part 2: Guide for assessment of compliance.

NF EN ISO 3126 September 2005: Plastics piping systems - Plastic components - Determination of dimensions

1.2. Test standards (Methods)

NF EN 681-1: Elastomeric seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 1: Vulcanized rubber.

NF EN 681-2: Elastomeric seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 2: Thermoplastic elastomers.

NF EN 728: Plastics piping and ducting systems - Polyolefin pipes and fittings - Determination of oxidation induction time.

NF EN ISO 2505: Thermoplastics pipes - Longitudinal reversion – Test method and parameters.

NF EN ISO 580: Plastics piping and ducting systems - Injection-moulded thermoplastics fittings - Methods for visually assessing the effects of heating

NF EN ISO 1167-1: Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 1: General method

NF EN ISO 1167-2: Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 2: Preparation of pipe test pieces

NF EN 1053: Plastics piping systems - Thermoplastics piping systems for non-pressure applications - Test method for watertightness

NF EN 1054: Plastics piping systems - Thermoplastics piping systems for soil and waste discharge - Test method for airtightness of joints.

NF EN 1055: Plastics piping systems - Thermoplastics piping systems for soil and waste discharge inside buildings - Test method for resistance to elevated temperature cycling.

ISO 1133 (November 2005): Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics.

NF EN 1277: Plastics piping systems - Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints.

ISO 1872/1: Plastics - Polyethylene (PE) moulding and extrusion materials - Part 1: Designation system and basis for specifications.

NF EN 1989: Plastics piping and ducting systems - Joints for buried non-pressure sewerage applications - Test method for long-term sealing performance of joints with thermoplastic elastomer (TPE) seals by estimating the sealing pressure.

ISO 4065: Thermoplastics pipes - Universal wall thickness table

ISO 4440-1: Thermoplastics pipes and fittings - Determination of melt mass-flow rate - Part 1: Test method

ISO 4440-2: Thermoplastics pipes and fittings - Determination of melt mass-flow rate - Part 2: Test conditions

NF EN ISO 9969: Thermoplastics pipes - Determination of ring stiffness.

2. CERTIFIED CHARACTERISTICS, TEST METHODS AND SPECIFICATIONS

The conditions for verification of the characteristics certified at CSTB are listed in the tables below.

Certified characteristics				Test Methods		Specifications	
	Pipe	Fitting	Material	Reference standard	Operating conditions	Reference standard	Values
Appearance	X	X					
Geometric characteristics	X	X		NF EN ISO 3126		NF EN 1519-1	
Melt mass-flow rate MFR	X		X (Pipe and fitting)	ISO 4440-1 and ISO 4440-2 ISO 1133	Condition 18 190 °C 10 min 5 kg	NF EN 1519-1	Between 0.2 and 1.1 g/10 min Maximum pipe MFR variation in relation to the raw material 0.2 g/10 min
Longitudinal reversion	X			NF EN ISO 2505	Method B ¹⁾ (in air) 110 °C ± 2°C 30 min	NF EN 1519-1	≤ 3% no bubble or crack
Resistance to pressure <i>For BD application (material test)</i>			X (Pipe and fitting)	NF EN ISO 1167-1-3		NF EN 1519-1	At 80°C: min. resistance 165 h at 4 MPa
Effects of heat		X		NF EN ISO 580	Method A (in air) 110°C ± 2°C 1 h	NF EN 1519-1	No deterioration > 20% of the thickness of the wall around the injection point - No opening in the weld line > 20% of the thickness of the wall
Thermal stability* <i>*material used for pipe or fittings designed for butt-welding</i>			X	NF EN 728	200 °C	NF EN 1519-1	OIT ≥ 20 min
Ring stiffness <i>(for BD application)</i>	X from DN 75			NF EN ISO 9969	23 °C ± 2°C deflection of 3% rate defined in NF EN 1519-1 according to the DN	NF EN 1519-1	SN ≥ 4k N /m ²

¹⁾: The choice of method A or method B is the responsibility of the holder. However, in case of dispute, only the reversion test performed according to the liquid bath method in standard NF EN ISO 2505 will be the reference test.

²⁾: Only for fittings made with more than one part. The means of restraint of the sealing ring is not considered as a part.

Certified characteristics – continued

Certified characteristics			Test Methods		Specifications		
	Pipe	Fitting	Material	Reference standard	Operating conditions	Reference standard	Values
Watertightness	Shaped seals ²⁾			NF EN 1053	Water pressure: 0.5 bar	NF EN 1053	No leaks
Watertightness and airtightness	Pipe, fitting and assemblies (with seal ring and electrofusion sleeve)			NF EN 1053 and NF EN 1054		NF EN 1053 and NF EN 1054	No leaks
Resistance to elevated temperature cycling	Assembly including pipes, fittings and assemblies (with seal ring and by electrofusion sleeve)			NF EN 1055		NF EN 1055	No leaks before or after the test Deflection DN ≤ 50: ≤ 3 mm DN > 50: ≤ 0.05d _n
Tightness of assemblies with elastomer sealing ring (for the BD application)	Assembly from DN 75			NF EN 1277 Method 4 conditions B and C			Water: no leak Air: ≤ - 0.27 bar
Long-term performance of TPE seals (for BD application)				NF EN 1989		NF EN 1989	Pressure on the seal: a) at 90 days: ≥ 1.3 bars b) using the extrapolation to 50 years: ≥ 0.6 bars

3. VERIFICATION REGIME

The applicable verification regime is the half-yearly regime for the 12 months following admission, then the simplified half-yearly regime (see §3.3.2 of the body of the certification reference system).

4. MARKING

4.1. Component marking

The marking has at least the following information:

Pipes

The pipes must be indelibly marked at least every metre.

This marking must include at least the following elements:

- identification of the material,
- identification of the manufacturer (name or logo) and/or the commercial name of the product,
- identification of the factory (if there are several production sites),
- the dimensions (DN and th),
- the *QB* logo followed by the two last parts of the certificate number,
- the manufacturing references allowing traceability,
- reaction to fire class.

Fittings

Every individual fitting must bear the following marking, marked indelibly:

- identification of the material (1),
- identification of the manufacturer (name or logo) and/or the commercial name of the product,
- the DN of the associated pipe,
- the angle (if necessary),
- the *QB* logo followed by the two last parts of the certificate number (1),
- the manufacturing references allowing traceability (the production period, at least the month and year, in numbers or in code) (1).


In all cases, the packaging must bear the *QB* logo followed by the last two parts of the certificate number.

4.2. QB marking model

Representation of the *QB* certification identification logo:



Example:

PEhd - X tube - 01 - 125 x 4,8 -  aa - xy - 01-10-18 – Me

(1) *If it is impossible to achieve the indelible marking of this information, marking is authorised on labels affixed to the fittings themselves or marking on the packaging.*

4.3. Commercial documents

References to the Certificate in commercial documents must only appear with certified components, systems or procedures and in the form shown below:



(Factory No.) - (order No.)

Any other presentation must be submitted to CSTB for approval.

5. CHECKS PERFORMED BY THE MANUFACTURER

The checks performed by the manufacturer and the measurements of the various characteristics are carried out in accordance with the inspection plan and the operating procedures defined in the reference standards cited in paragraph 1.1 of this technical document no. 08-05 Traditional (NF EN 1519-1 and -2).

5.1. Inspections conducted on raw materials

The applicant/holder shall carry out a verification operation at reception and, in any case, before use on all the components entering into the manufacture of its certified products.

The internal “reception” inspection established by the applicant/holder shall cover inspection methods for products upon receipt that assess their compliance and/or regularity with regard to the expected characteristics, including, if applicable, sampling rules for sampled products.

This inspection covers all management actions carried out by the supplier. For example: compliance sheet issued after a systematic control prior to delivery, which the applicant/holder requires the supplier to perform, supplier certified according to Standard NF EN ISO 9001 for relevant products or certified supplies, etc.

Inspections conducted on raw materials can be carried out in the holder’s laboratories or be the result of a quality assurance system obtained from suppliers. These checks are based on the components involved in the product’s manufacture.

5.2. Quality assurance operations during production

Inspection during production shall be arranged by the applicant/holder. This applies to the product in its intermediate states at the main production stages, as well as compliance with the setting instructions for the production tools (production machines, equipment).

Inspection instructions shall be formalised and made available to the operators. The results of the inspections are recorded upon each inspection. If the inspection results indicate that the product does not meet the requirements of this Certification Reference System, the necessary corrective actions must be implemented immediately.

- Check of the extrusion or injection parameters,
- Dimensional check,
- Homogeneity, surface condition,
- Marking inspection.

5.3. Inspection of finished products

Applicants/holders are required to verify the characteristics of the finished products before delivery and are responsible for arranging this inspection. The controls and tests of finished products manufactured by the applicant/holder are carried out according to the standards and additional specifications mentioned in this technical document.

Inspections on finished products are carried out by the applicants/holders themselves in their own manufacturing plants.

Applicants/holders shall take random samples at the end of the production line and carry out the controls and tests on these samples. The samples taken must be representative of the variety of dimensions of the products covered by this certification reference system.

The method for collecting the samples required for testing must be clearly specified in the applicant's/holder's quality plan and must not be left to the sole discretion of the operator.

Applicants/holders shall record the results of the previous inspections. If the results of the standard inspections are inconclusive, the inspections must be strengthened and the causes of the fault must be identified so that corrections can be made, by carrying out production controls if necessary.

6. MONITORING ARRANGEMENTS BY CSTB

6.1. Tests performed for admission and extension at CSTB

	Material	Pipe	Fitting	Assemblies
Appearance		X	X	
Dimensional characteristics		All the types submitted for admission 5 pipes per type	All the types submitted for admission: by dimensional inspection on the stock on at least half the range presented and by verification of the inspection registers for the entire range	
Melt mass-flow rate (MFR)	Virgin material for each reference used for the manufacture of pipes and fittings	1 recrushed sample		
Longitudinal reversion		1 test per type sampled		
Effects of heat			1 test per type sampled	
Thermal stability	Virgin material for each reference used for the manufacture of pipes and fittings designed for butt-welding			
Resistance to pressure	Virgin material for each reference used for the manufacture of pipes and fittings			
Ring stiffness	from DN 75	On 3 DN		
Air tightness				On 1 DN 1 assembly with electrofusion sleeve and 1 assembly with expansion joint
Watertightness				On 1 DN 1 assembly with electrofusion sleeve and 1 assembly with expansion joint

	Material	Pipe	Fitting	Assemblies
Resistance to thermal cycles				1 assembly including expansion sleeves and welded assemblies
Tightness of assemblies with elastomer sealing ring (for the BD application) from DN 75				1 sealing ring assembly Pipe/pipe or pipe/fitting On 3 DN
Long-term performance of TPE seals (for BD application)				X
Watertightness			Shaped seals: 1 test per type sampled	

6.2. Tests performed during follow-up at CSTB

	Material	Pipe	Fitting
Appearance		X	X
Dimensional characteristics		3 types of pipe 3 pipes per DN	3 types of fitting selected at random 5 fittings per type
Melt mass-flow rate (MFR)	Virgin material for each reference used for the manufacture of pipes and fittings	1 recrushed sample	1 recrushed sample
Effects of heat			On 1 type of fitting
Ring stiffness from DN 75		On 1 DN	
Longitudinal reversion		On 3 DN	
Thermal stability	Virgin material for each reference used for the manufacture of pipes and fittings designed for butt-welding		

	Assembly
Tightness of assemblies with elastomer sealing ring (for the BD application) from DN 75	On 1 assembly
Resistance to thermal cycles	1 assembly including expansion sleeves and welded assemblies
Air tightness	on 1 DN 1 assembly with electrofusion sleeve and 1 assembly with expansion joint
Watertightness	on 1 DN 1 assembly with electrofusion sleeve and 1 assembly with expansion joint

The tests listed in the above table of tests on assemblies are performed once every 5 years or if changes are made to the products. The samples required to perform these tests may be taken during a visit to the production site or sent to CSTB outside the visiting period.

7. SAMPLING FOR TESTS AT CSTB

The minimum quantities of samples to be taken for the performance of these tests are given in the table below:

Pipe	Fitting	Virgin material
5 x 1 m sections in 3 DN	5 fittings of 3 different types	1 sachet of pipe virgin material and 1 sachet of fitting virgin material