

WATER DISTRIBUTION OR DRAINAGE PIPES**Technical document**
08-02 Non-traditional

Heating and/or domestic distribution
and/or distribution of chilled water

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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
01	01/07/2020	Integration of the following tests: - PPR pipes: CHARPY impact test - PPR fittings with metallic core: chemical analysis of metal fittings by Spark Optical Emission Spectrometer
02	17/04/2023	<ul style="list-style-type: none"> - - § 2.1 Certified Characteristics - - § 2.2 Test methods - - Part 3 Verification Regime - - Part 4 Marking

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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 ISO 15874-1: Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 1: General

NF EN ISO 15874-2: Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 2: Pipes

NF EN ISO 15874-3: Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 3: Fittings

NF EN ISO 15874-5: Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 5: Fitness for purpose of the system

NF EN ISO 15874-2/A2: Plastic piping systems for hot and cold water installations - Polypropylene (PP) - Part 2: pipes - Amendment 2: Impact test

NF EN ISO 15875-1: Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 1: General

NF EN ISO 15875-2: Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 2: Pipes

NF EN ISO 15875-3: Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 3: Fittings

NF EN ISO 15875-5: Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 5: Fitness for purpose of the system

NF EN ISO 15876-1: Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 1: General

NF EN ISO 15876-2: Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 2: Pipes

NF EN ISO 15876 3: Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 3: Fittings

NF EN ISO 15876-5: Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 5: Fitness for purpose of the system

NF EN ISO 15877-1: Plastics piping systems for hot and cold water installations - Chlorinated poly(vinyl chloride) (PVC-C) - Part 1: General

NF EN ISO 15877-2: Plastics piping systems for hot and cold water installations - Chlorinated poly(vinyl chloride) (PVC-C) - Part 2: Pipes

NF EN ISO 15877-3: Plastics piping systems for hot and cold water installations - Chlorinated poly(vinyl chloride) (PVC-C) - Part 3: Fittings

NF EN ISO 15877-5: Plastics piping systems for hot and cold water installations - Chlorinated poly(vinyl chloride) (PVC-C) - Part 5: Fitness for purpose of the system

NF EN ISO 22391-1: Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 1: General

NF EN ISO 22391-2: Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 2: Pipes

NF EN ISO 22391-3: Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 3: Fittings

NF EN ISO 22391-5: Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 5: Fitness for purpose of the system

NF EN ISO 21003-1: Multilayer piping systems for hot and cold water installations inside buildings - Part 1: general

NF EN ISO 21003-2: Multilayer piping systems for hot and cold water installations inside buildings - Part 2: pipes

NF EN ISO 21003-2/A1: Multilayer piping systems for hot and cold water installations inside buildings - Part 2: amendment 1

NF EN ISO 21003-3: Multilayer piping systems for hot and cold water installations inside buildings - Part 3: fittings

NF EN ISO 21003-5: Multilayer piping systems for hot and cold water installations inside buildings - Part 5: fitness for use of the system

XP CEN ISO/TS 21003-7: Multilayer piping systems for hot and cold water installations inside buildings - Part 7: guidance for assessment of conformity

NF EN 1254-3 - Copper and copper alloys - Plumbing fittings - Part 3: Fittings with compression ends for use with plastics pipes

NF EN 1254-6 –Copper and copper alloys - Plumbing fittings - Part 6: Fittings with push-fit ends

NF EN 1254-8 - Copper and copper alloys - Plumbing fittings - Part 8: Fittings with press ends for use with plastic and multilayer pipes

NF EN 1254-7: Copper and copper alloys – Fittings – Part 7: Crimp fittings for metal tubes

1.2. Test standards

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

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

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 ISO 1167-3: Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 3: Preparation of components

NF EN ISO 1183-1: Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method

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

NF EN ISO 3126: Plastics Piping Systems - Plastics components - Determination of dimensions

NF EN ISO 6259-1: Thermoplastics pipes - Determination of tensile properties - Part 1: General test method

ISO 6259-3: Thermoplastics pipes – Determination of tensile properties – Part 3: Polyolefin pipes

NF EN ISO 11357-1: Plastics - Differential scanning calorimetry (DSC) - Part 1: General principles

NF EN ISO 10147 - Pipes and fittings made of crosslinked polyethylene (PE-X) - Estimation of the degree of crosslinking by determination of the gel content

NF EN 727: Plastics piping and ducting systems - Thermoplastics pipes and fittings - Determination of Vicat softening temperature (VST).

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

NF EN 744: Plastics piping and ducting systems - Thermoplastics pipes - Test method for resistance to external blows by the round-the-clock method.

NF T 54 094: Plastics piping systems made of unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C) for conveyance under pressure of non gaseous fluids - Fittings - Determination of resistance to alternate pressure stress

NF EN ISO 527-1 - Plastics - Determination of tensile properties - Part 1: General principles

ISO 17454: Plastics piping systems - Multilayer pipes - Test method for the adhesion of the different layers using a pulling rig

Test method for the analysis of the chemical composition of brass fittings of all kinds of tubes: NF EN 15079: Copper and copper alloys – Analysis by spark optical emission spectrometry (SEO-E)

Test method for the analysis of the chemical composition of brass fittings of all kinds of tubes: ICP (Inductively Coupled Plasma) method: The carbon and sulfur contents are determined by combustion of the sample under a current of oxygen the dosage of CO₂ and SO₂ formed by infrared detection.

The other elements are determined by plasma emission spectrometry after dissolving the sample.

Test method for the analysis of the chemical composition of metal fittings (with the exception of brass) of all types of tubes: CSTB protocol inspired by the NF EN 15079 standard.: The test consists of measuring the intensity of radiation, the wavelength of which is characteristic of each element, generated by the spark resulting from the application of an electric discharge between the sample, constituting an electrode, and an inert counter-electrode. The element concentrations are determined by plotting the intensities measured from the test samples on calibration curves established from reference materials.

ISO 9854-1: Thermoplastics pipes for the transport of fluids. Determination of pendulum impact strength by the Charpy method. Part 1: general test method.

ISO 9854-2: Thermoplastics pipes for the transport of fluids. Determination of pendulum impact strength by the Charpy method. Part 2 : test conditions for pipes of various materials.

NF EN ISO 3501: Plastics piping systems – Mechanical joints between fittings and pressure pipes – Test method for resistance to tearing under a constant longitudinal force

NF EN ISO 3503: Plastics piping systems – Mechanical joints between fittings and pressure pipes – Test method for leaktightness under internal pressure of assemblies subjected to bending¹⁰

NF EN 12293: Plastic piping systems - Thermoplastic pipes and fittings for pressurized hot and cold water installations - Test method for the resistance of assemblies to temperature cycles

NF EN 12294: Plastic piping systems - Systems for installing hot and cold water under pressure - Test method for vacuum tightness

NF EN 12295: Plastic piping systems - Thermoplastic pipes and associated fittings for pressurized hot and cold water installation - Test method for resistance of assemblies to pressure cycles

EN ISO 17456: Plastics piping systems - Multilayer pipes - Determination of long-term strength

2. CERTIFIED CHARACTERISTICS AND TEST METHODS

2.1. Certified characteristics

The characteristics listed in the table below will comply with the specifications given in the corresponding Technical Appraisals.

For products and/or certified claimed characteristics that do not fall under the table below, these verification conditions may be supplemented (or substituted) by specific measures stated in the Technical Appraisals.

Certified characteristics	NATURE OF THE COMPONENT OR SYSTEM								
	(6) Pipe PE-X PE-RT PB PP-R PP-B	Metal fitting all types of pipe and pipe/metal fittings systems	Fitting PB PP-R	System PVCC and modified PVC		Pipe Multilayer with metal core	Pipe pre- insulated PE-X or PB or Copper	Pipe sheath ed copper	Pipe Cu/PE- RT
				Pipe	Fitting				
Dimensional characteristics *	X	X	X	X	X	X	X	X	X
Identification by thermogravimetry				<i>on the adhesive</i>					
Chemical analysis of fittings		x							
Gel content	X ⁽¹⁾					X ⁽¹⁾			
Melt mass-flow rate (MFR)	X ⁽²⁾		X						
Tensile properties	X			X				X <i>on sheath</i>	
Tensile properties after ageing	X ⁽⁷⁾								
CHARPY impact test	X ⁽⁹⁾								
Resistance to delamination						X			X
Resistance to oxidation	X ⁽³⁾		X			X <i>int. layer</i>			
Heat shrinkage	X			X					
Density				X	X				
Resistance to oven					X				
Vicat softening temperature				X	X				
Resistance to alternate pressures		X ⁽⁴⁾			X ⁽⁵⁾				
Resistance to pressure	X	X	X	X	X	X	X		X
Resistance to impact ⁽⁸⁾				X					
Heat transfer pipe that is NF or QB certified or compliant with currently applicable standards							X	X	X

*: these characteristics are certified based on verification of the holder's registers and recorded in the audit report

(1) on crosslinked products

(2) if applicable

(3) except PP-B

(4) on push-fit fittings and crimp fittings (metal/metal assemblies only)

(5) test performed on 5 test pieces

(6) for pipes fitted with an oxygen barrier, see table on last page of the certification reference system (appendix page 78)

(7) for PEX pipes WITHOUT oxygen barrier

(8) for a few DN, the mass of the striker and its drop height have been converted into energy at the point of impact. This delivered energy complies with the mark certification reference system RT 15-1 and the product standards using different striker masses and drop heights.

(9) Only for PP pipes and fittings

(10) Details for Charpy impact tests (see table 11 of standard NF EN ISO 15874-2/Amd.2:2022):

- The Charpy test is carried out for DN 16-20-25 on whole pipes,
- The Shock test (dial method, ISO 3127) is carried out for DN >25

2.2. Test methods

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

These verification conditions may be supplemented by specific measures given in the Technical Appraisals.

2.2.1. Polyolefin pipes and fittings and multilayer pipes

Certified characteristics	Pipe PE-RT	PE-X pipe	PB pipe	PP-R pipe	PP-B pipe	PB fitting	PP-R fitting	Pipe Multilayer with metal core	Pipe Cu/PE-RT	
Dimensional characteristics	NF EN ISO 3126							NF EN ISO 3126	NF EN ISO 3126	
Gel content		NF EN ISO 10147 (without oxygen barrier) on chip						NF EN 579 (on inside PE-X layer only) on chip		
Melt mass-flow rate (MFR)	NF EN ISO 1133 190°C – 5 kg	NF EN ISO 1133								
		190°C 2.16 kg or 5 kg	230°C 2.16 kg	230°C 2.16 kg	190 °C 5 kg	230°C 2.16 kg				
Tensile properties	NF EN ISO 6259-1- ISO 6259-3 type 1 or 2 specimen for DN > 25 and 1 NF EN ISO 527 BA for DN ≤ 25									
Tensile properties after ageing	NF EN ISO 6259-1- ISO 6259-3 type 1 or 2 specimen for DN > 25 and 1 NF EN ISO 527 BA for DN ≤ 25									
Resistance to delamination								ISO 17454	ISO 17454	
Resistance to oxidation 1)	NF EN 728 and/or NF EN ISO 11357-1 and -6									
	200°C 40 min	200°C 30 min	210 °C 20 min	200°C 20 min		210 °C 20 min	200°C 20 min	Depending on material (on inside layer only)		
Heat shrinkage	NF EN ISO 2505 – In air									
	110°C	120°C	110°C	135°C	150°C					
	1 h for th ≤ 8 mm 2 h min if 8 mm < th ≤ 16 mm 4 h if th > 16 mm									
Resistance to pressure 1000 h	NF EN ISO 1167 1-2-3 – at 95°C water in air*									
	σ = 3.4 MPa (type 1) σ = 3.6 MPa (type 2)	σ = 4.4 MPa	σ = 6 MPa or σ = 4.9 MPa for PB-R	σ = 3.5 MPa	σ = 2.6 MPa	Pressure corresponding to σ of 6 MPa applied to the pipe	Pressure corresponding to σ of 3.5 MPa applied to the pipe	According to Technical Appraisal	According to Technical Appraisal	

*: In the event of non-compliant results, a water-in-water recovery test will be performed

1): The reference test is that carried out in accordance with standard NF EN 728

Certified characteristics	PP Pipe	PP fittings with metallic core
chemical analysis of metal fittings by Spark Optical Emission Spectrometer		CSTB protocol inspired by standard NF EN 15079 or ICP method, Compliance with the Technical Appraisal
CHARPY impact test 1)	ISO 9854-1-2 <10%	
Impact round the clock method	NF EN ISO 15874-2/A2	

1) Details for the Charpy impact tests (see table 11 of standard NF EN ISO 15874-2/Amd.2:2022):

- The Charpy test is carried out for DN 16-20-25 on whole pipes,
- The Shock test (dial method, ISO 3127) is carried out for DN >25

2.2.2. PVCC pipes and fittings

Certified characteristics	Pipe	Fitting
Dimensional characteristics	NF EN ISO 3126	
Identification by thermogravimetry	on the adhesive (CSTB protocol)	
Tensile properties	NF EN ISO 6259-1- ISO 6259-3 type 1 or 2 specimen for DN > 25 and 1 NF EN ISO 527 BA for DN ≤ 25	
Heat shrinkage	NF EN ISO 2505 Method B 1) (in air) 150 °C 30 min for $th \leq 4mm$ 60 min for $4 mm < th \leq 16mm$ 120 min if $th \geq 16 mm$	
Density	NF EN ISO 1183	NF EN ISO 1183
Resistance to oven		NF EN ISO 580 – at 150°C 15 min for $th \leq 3 mm$ 30 min for $3 mm < th \leq 10 mm$ 60 min if $10 mm < th \leq 20 mm$
Vicat softening temperature	NF EN 727	NF EN 727
Resistance to alternate pressures		NF 54 094 20 bar/60 bar 1 hz for DN < 110 0.4 hz for DN ≥ 110
Resistance to pressure 1 h	NF EN ISO 1167 1-2-3 at 20°C σ according to Technical Appraisal	NF EN ISO 1167 1-2-3 at 20°C pressure according to Technical Appraisal

Resistance to pressure 10 h	NF EN ISO 1167 1-2-3 at 60 °C σ according to Technical Appraisal	
Resistance to pressure 1000 h	NF EN ISO 1167 1-2-3 in air or in water θ and σ according to Technical Appraisal	NF EN ISO 1167 1-2-3 in air or in water θ and pressure according to Technical Appraisal
Resistance to pressure 3000 h	On assemblies (glued pipes and fittings), 20 d drying at ambient temperature + 4 d at 80°C, pressure according to Technical Appraisal	
Impact resistance	NF EN 744	

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.

2.2.3. Metal fittings and Cu/PE pipes

Certified characteristics	Metal fitting All types of metal pipes and metal pipes/fittings system	Metal fitting All synthetic pipes	Cu/PE pipe
Resistance to delamination			ISO 17454
Resistance to alternate pressures	NF T 54 094 1 PN/3 PN under 1 hz 20,000 cycles		
Resistance to pressure 1 h	NF EN ISO 1167 1-2-3 in air or in water 20°C -3xPN (Then P max after 1 h)		
Resistance to pressure 1000 h		NF EN ISO 1167 1-2-3 in air or in water θ and σ according to Technical Appraisal of the pipe tested at the same time as the fitting	
Chemical analysis of the metal fittings by Spark Optical Emission Spectrometer	CSTB protocol inspired by standard NF EN 15079 or ICP method, compliance with the Technical Appraisal		

2.3. Other characteristics

TESTS ON SHEATHS

2.3.1. Sheath leaktightness check

This test is conducted according to the following operating procedure:

- single sheath: visual inspection of the sheath in curved position (corresponding to the minimum bending radius of the pipe) in two planes:
 - perpendicular to the mating plane,
 - in the mating plane.
- multiple sheaths:
 - identical test after separation of the sheaths. Can be reduced to bending in the mating plane if the fasteners between the sheaths cause too much rigidity to perform bending perpendicular to the mating plane.

Specification: the visual inspection of the sheath held in the bent position must not reveal any cracks or tears.

2.3.2. Sheath crush resistance test

This test is carried out under the conditions defined by standards NF EN 61386-1 and NF EN 61386-22.

Specification: for pre-sheathed pipes, the minimum resistance to crushing of the sheaths is 450N.

2.3.3. Dimensional check

Measurement of the inside diameter of the sheaths is carried out using internal callipers (the measured value is the average of the minimum value and the maximum value read).

Specification: Dimensional inspection: the specifications for the minimum inside diameters are defined in the "Technical Specifications (CPT) for the implementation of pipe systems based on synthetic pipes - Pipes in coils or rods" (CSTB specification 2808_V2 – November 2011).

2.3.4. Method for monitoring these characteristics

Documented monitoring by the holder or supplier of sheaths if the latter conducts the tests in their laboratory.

Performance of these tests at CSTB if the holder or supplier of the sheaths does not conduct the tests in their laboratory.

The list of sheath suppliers is subject to a declaration to CSTB. This list can be modified at any time.

3. VERIFICATION REGIME

	12 months following admission	After the 12 months following admission
Pre-insulated pipes (PE-X - PB – Copper) based on a Technical Appraisal of the heat transfer pipe	Simplified annual	
Pre-insulated pipes (PE-X - PB – Copper) not based on a Technical Appraisal of the heat transfer pipe	Half-yearly	Simplified half-yearly PEX type test series
Pre-insulated pipes (PE-X - PB – Copper) based on a Technical Appraisal of the heat transfer pipe with a non-certified fitting	Half-yearly	Simplified half-yearly Pressure tests 1000 h + spectro
Pre-insulated pipes (PE-X - PB – Copper) based on a Technical Appraisal of the heat transfer pipe for part of the range and not certified for the other part of the range with a non-certified fitting	Half-yearly	Simplified half-yearly Pressure tests 1000 h + spectro
Sheathed copper pipe	Simplified annual	
Metal fittings for metal pipes	Annual	
Metal systems **	Annual	
Metal fittings for synthetic pipes and multilayer pipes	Half-yearly	Simplified half-yearly
PE-X - PE-RT – PB- -PP-R - PP-B pipes	Half-yearly	Simplified half-yearly
PB - PP-R fittings	Half-yearly	Simplified half-yearly
PVCC and modified PVC system	Half-yearly	Simplified half-yearly
Multilayer pipes with metal core and Cu/PE-RT pipes	Half-yearly	Simplified half-yearly

** : For a metal system Technical Appraisal (stainless steel): 1 annual audit on the production site and case of a pipes and fittings system Technical Appraisal: 1 annual audit at the fittings production site and the pipes production site.

Case of pre-insulated pipes:

1- Certified heat transfer pipes and fittings:

- Audit only of the pre-insulation site (frequency: Reduced annual),
- No direct debit

2- Certified service pipes with non-certified fittings:

- Fittings and pre-insulation site audit (frequency: half-yearly for 12 months following admission, then lightened half-yearly),
- Sampling tests 1000h + spectro (2x/year)

3- Service pipes certified for part of the range and non-certified for the other part of the range with non-certified fittings:

- Non-certified pipe site audit, pre-insulation site and fittings site (frequency: half-yearly for 12 months following admission, then reduced half-yearly).
- 1000h test sampling with certified tubes and 1000h test sampling with non-certified tubes (i.e. 2 1000h tests per year + spectro)

4- Non-certified service pipes with non-certified fittings:

- Non-certified pipe site audit, pre-insulation site and fittings site (frequency: half-yearly for 12 months following admission, then reduced half-yearly)
- Sampling complete series of tubes and fittings tests (2x/year)

4. MARKING

4.1.1. Pipes

The pipes must be marked indelibly, at least every meter.

This marking must include at least the following elements:

- the number of the standard if applicable,
 - the mention ATEC or Avis Technique as well as its number,
 - the QB logo (or in full) or "QB D", "QB F" or "QB DF" if claimed, followed by the last two parts of the certificate number,
 - the name of the holder or the distributor (1) (name, acronym or logo, if the acronym or logo is not explicit, this must be filed with CSTB) and the commercial name of the product,
 - the identification of the material,
 - the nominal diameter and the nominal wall thickness,
 - the application classes (for example: 2, 4, 5) completed with their corresponding service pressures (2), (for example: "[Class 2 – 6 bar] [Class 4 – 6 bar] [Class 5 – 6 bar]", if applicable
 - the mention "PCRBT" when only class 4 underfloor heating is covered if applicable,
 - the statement "NON-DRINKING WATER" when class 2 is not targeted, if applicable
 - the manufacturing marks allowing traceability comprising at least:
 - the period of manufacture, at least the month and the year, in numbers or in code,
- PCRBT: Low Temperature Cooling Underfloor Heating

4.1.2. Fittings

The fittings must bear, individually, at least the indelible marking described below. The following information must be marked on the fitting:

- the name of the holder or the distributor (1) (name, acronym or logo, if the acronym or logo is not explicit, this must be registered with CSTB) or the commercial name of the product,
- the nominal diameter of the associated tube,
- the identification of the material (if the connection is to be welded or to be glued),
- the QB logo (not mandatory for family B fittings) or QB letters
in case of impossibility
- the manufacturing marks allowing traceability comprising at least:
- the period of manufacture, at least the month and the year, in numbers or in code,

4.1.4. Labelling/Packaging of fittings

The following information must be marked on a label affixed to the fitting or its packaging:

- the name of the holder or the distributor (1) (name, acronym or logo, if the acronym or logo is not explicit, this must be registered with CSTB) and the commercial name of the product,
- the mention ATEC or Avis Technique as well as its number if non-traditional product,
- the nominal diameter of the associated tube,
- the nominal wall thickness of the associated pipe (except for welded and glued fittings),
- the Application Classes (for example: 2, 4, 5) supplemented by their service pressures and their corresponding maximum service temperatures, (for example: "[Class 2 – 6 bar –] [Class 4 – 6 bar] [Class 5 – 6 bar]",
- the mention "PCRBT" when only class 4 underfloor heating is covered if applicable,
- the statement "NON-DRINKING WATER" when class 2 is not targeted, if applicable
- the number of the standard
- the QB logo followed by the last two parts of the certificate number
- the manufacturing marks allowing traceability comprising at least:
- the period of manufacture, at least the month and the year, in numbers or in code,
PCRBT: Low Temperature Cooling Underfloor Heating

(1) A distributor is the beneficiary of a commercial extension.

4.2. Water distribution pipe systems based on metal pipes assembled with crimp or push-fit fittings

4.2.1. Copper pipes

Copper pipes must be marked in accordance with the provisions of the Copper pipes NF mark regulation. In the case of dimensions not referred to by the NF mark, the marking will include the same information except for the NF logo.

The packaging must bear the Technical Appraisal number and the QB logo followed by the last two parts of the certificate number.

5. SAMPLING FOR TESTS AT CSTB

PE-X - PB PP-R - PP-B PE-RT multilayer Cu/PE-RT	PB – PPR		PVC-C			Metal fittings
	Pipes	Fittings	Virgin material	Pipes	Fittings	
Coils 10 to 15 m of the same DN x th Straight rods 10 to 15 1m sections of the same DN x th	5 fittings of each type necessary for the performanc e of pressure tests and for metal core PPR fittings one metal insert for chemical analysis of the fittings	1 sachet of pipe virgin material and 1 sachet of fitting virgin material	20 1m sections of the same DN x th	15 fittings of one type and 5 of two different types	2 pots	5 to 20 ** fittings per DN

* sample to be taken if the thermogravimetry test is specified in the Technical Appraisal

** quantity to be adjusted according to the needs of the laboratory in building the test circuits