

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

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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 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 – Multilayer piping systems for hot and cold water installations inside buildings
- 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

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 chemical analysis of metal fittings, all types of pipe: CSTB protocol

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.

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 sheathe d 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	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

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	NF EN 728									
	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 ≤ 8mm 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

Certified characteristics	PP Pipe	PP fittings with metallic core
chemical analysis of metal fittings by Spark Optical Emission Spectrometer		CSTB protocol, Compliance with the Technical Appraisal
CHARPY impact test	ISO 9854-1-2 <10%	

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 ≤ 4mm 60 min for 4 mm < th ≤ 16mm 120 min if th ≥ 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 ≤ 3 mm 30 min for 3 mm < th ≤ 10 mm 60 min if 10 mm < th ≤ 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 test protocol, 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
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.

4. MARKING

4.1. Water distribution pipe systems based on synthetic and multilayer metal-core pipes

4.1.1. Pipes

The pipes must be indelibly marked at least every metre.

This marking must include at least the following elements:


- the number of the product standard (e.g. EN ISO 15875), if applicable,
- the name of the holder of the Technical Appraisal or the distributor ⁽¹⁾ (name or logo) and/or the commercial name of the product,
- identification of the material, (*)

- the nominal diameter and nominal thickness of the wall followed by the dimensional class defined by the standard (e.g. “16x1.5 / A” or “16x1.5 / Class A”), or in the case of PVC-C, series S (e.g. 16x1.8 / S4),
- the application classes (e.g. 2, 4, 5) completed by their corresponding service pressures ⁽²⁾, (e.g. “[Class 2 – 6 bar] [Class 4 – 6 bar] [Class 5 – 6 bar]”),
- the statement “UNDERFLOOR HEATING” when only class 4 underfloor heating is referred to,
- the statement “HEATING ONLY” when class 2 is not referred to
- the number of the Technical Appraisal,
- the QB logo followed by the two last parts of the certificate number,
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code,
- metric marking.

E.g. (crosslinked polyethylene pipe (family B according to the Technical Appraisal) intended for the production of hot and cold domestic water distribution and high and low temperature heating installations)

EN ISO 15875 - XXX - 20x1,9 / Class A - PE-Xa - [Class 2 – 6 bar] [Class 4 – 6

bar] [Class 5 – 6 bar] - - opaque - ATEC no.14/10-XYZ

-xyz - Manufacturing references - 100m

The operating temperatures according to the usage classes which may be marked on synthetic pipes and multilayer metal core pipes are as follows:

Classification of operating conditions (Classes)	Maximum operating temperatures (TD)	Scope of classes
2	70°C	Hot water supply
4	60°C	Underfloor heating Low temperature radiators
5	80°C	High temperature radiators

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

⁽²⁾ For pipes and fittings intended only for the “Chilled Water” application class, the marking on the pipe will include the statement “Chilled Water”, the corresponding operating pressure and the minimum and maximum temperatures of the fluid conveyed.

^(*): The use of PERT is authorised on a multilayer pipe marked PE/Al/PE if the verifications are carried out based on the specifications of the PE according to the following conditions:

- Use of the PE-RT only applies to the outer layer,
- 3 cases can be accepted for the outer layer:
 - 1- PE layer only

- 2- PE or P-ERT layer for the same pipe
 - 3- PE-RT layer only
- Verifications are carried out based on the PE specifications,

N.B. Marking rule for ATEC *Vx: marking of the ATEC number in the version *Vx is optional, the original ATEC number is sufficient.

Commercial extension: the original ATEC number is not authorised, the commercial extension number is mandatory.

4.1.2. Synthetic fittings

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


- the name of the holder of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the nominal diameter of the related pipe,
- identification of the material (if the fitting is to be welded or glued),
- the QB logo (not mandatory for fittings from family B),
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code.

4.1.3. Metal fittings

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

- the name of the holder of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the nominal diameter of the related pipe,
- the nominal thickness of wall of the related pipe for fittings with an insert (not mandatory),
- the QB logo followed by the last two parts of the certificate number or, failing that, the QB indication alone and in full (by derogation from the QB mark usage guide), **(this statement is not obligatory for metal fittings for multilayer pipes)**,
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code.

E.g. (Metal fitting for synthetic pipe)

XXX - 20x1.9 -  aa-xyz - manufacturing references
or
XXX - 20 -- QB – manufacturing references

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

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 of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the nominal diameter of the related pipe,
- the nominal thickness of the wall of the related pipe (except for fittings for welding or gluing),
- the application Classes (e.g. 2, 4, 5) completed by their operating pressures (2) and their corresponding maximum operating temperatures, (e.g. “[Class 2 – 6 bar] [Class 4 – 6 bar] [Class 5 – 6 bar]”,
- Possibly a statement specifying that the fitting rules are defined in the Technical Appraisal(s),
- the number of the Technical Appraisal,
- the QB logo followed by the two last parts of the certificate number.
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code,

E.g. (Packaging or labels for fittings referred to in §4.1.2)

XXX – EN ISO 15875 - 20x1.9 - [Class 2 – 6 bar] [Class 4 – 6 bar]

[Class 5 – 6 bar] – See fitting rules in Technical Appraisal -

ATEC no.14/10-XYZ a  yz - Manufacturing references

The operating temperatures according to the usage classes which may be marked on synthetic pipes and multilayer metal core pipes are as follows:

Classification of operating conditions (Classes)	Maximum operating temperatures (TD)	Scope of classes
2	70°C	Hot water supply
4	60°C	Underfloor heating Low temperature radiators
5	80°C	High temperature radiators

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

⁽²⁾ For pipes and fittings intended only for the “Chilled Water” application class, the marking on the pipe will include the statement “Chilled Water”, the corresponding operating pressure and the minimum and maximum temperatures of the fluid conveyed.

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

4.2.1. Steel pipes

The pipes must be indelibly marked at least every two metres.
This marking must include at least the following elements:

- the name of the holder of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- identification of the material,
- the dimensions (external diameter and thickness),
- the number of the Technical Appraisal,
- the QB logo followed by the two last parts of the certificate number,
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code.
 - the steel grade (2)

4.2.2. 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.

4.2.3. Crimp or push-fit fittings

Individual fittings must bear at least the marking described below, marked indelibly:

- the name of the holder of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the external diameter of the corresponding pipe,
- the QB logo followed by the last two parts of the certificate number or, failing that, the QB indication alone and in full (by derogation from the QB mark usage guide) (this statement is only obligatory for a fittings Technical Appraisal)
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code, (not mandatory),
 - identification of the factory if there are several production sites, by name or code.

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

⁽²⁾ If 2 steel grades are declared in the Technical Appraisal.

4.2.4. 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 of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the nominal diameter of the related pipe,
- the number of the Technical Appraisal,
- the QB logo followed by the two last parts of the certificate number.

- the manufacturing references allowing traceability, including at least*:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code,

*: Not mandatory if the traceability is marked on the fittings

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

4.3. Pre-insulated pipes

Synthetic heat transfer pipes must be marked in accordance with the measures in §4.1.

Metal heat transfer pipes must be marked in accordance with the measures in §2.2.

The outer sheath must have at least the following information:

- the name of the holder of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the dimensions (external diameters of the sheath and of the inner heat transfer pipe),
- in the case of synthetic heat transfer pipes: the Application classes (e.g. 2, 4, 5) completed by their operating pressures and their corresponding maximum operating temperatures (2), (e.g. “[Class 2 – 6 bar – 70°C] [Class 4 – 6 bar – 60°C] [Class 5 – 6 bar – 80°C]”),
- Technical Appraisal number,
- the QB logo followed by the two last parts of the certificate number,
- length,
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code.

4.4. Sheathed copper pipes and CU/PE RT pipes

Heat transfer pipes must be marked in accordance with the measures in §2.2.

The outer sheath must have at least the following information:

- the name of the holder of the Technical Appraisal or the distributor (1) (name or logo) and/or the commercial name of the product,
- the dimensions (external diameter of the copper pipe),
- the field of application,
- Technical Appraisal number,
- the QB logo followed by the two last parts of the certificate number,
- the manufacturing references allowing traceability, including at least:
 - the production period, at least the month and year, in numbers or in code,
 - identification of the factory if there are several production sites, by name or code.

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

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

⁽²⁾ For pipes and fittings intended only for the “Chilled Water” application class, the marking on the pipe will include the statement “Chilled Water”, the corresponding operating pressure and the minimum and maximum temperatures of the fluid conveyed.

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 m sections of the same DN x th	5 fittings of each type necessary for the performance 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