AENOR N Mark Specific Rules for Crosslinked polyethylene (PEX) piping systems for hot and cold water installations

Note: This document is a translation of the Spanish document RP 001.03 rev 12, approved by the Plastics Technical Certification Committee (CTC-001). Spanish version always prevails over this translation.

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1 Purpose and scope

These specific rules describe, in compliance with section 3.2 of the General rules for the AENOR Certification of Products and Services with N Mark, hereafter the General Rules, the specific rules for the certification for Crosslinked polyethylene (PEX) piping systems for hot and cold water installations. The present Specific Rules complete the AENOR N Mark Specific Rules for plastic materials – common requirements (RP 01.00). The General Rules always prevail over the present Specific Rules.

The N mark for Crosslinked polyethylene (PEX) piping systems for hot and cold water installations, hereafter the Mark, denotes product compliance with the following standards: UNE-EN 15875-1:2004, UNE-EN ISO 15875-1:2004/A1:2007, UNE-EN ISO 15875-2:2004, UNE-EN ISO 15875-2:2004/A1:2007, UNE-EN ISO 15875-3:2004, UNE-EN ISO 15875-5:2004 or SANS 15875-1:2004, SANS 15875-2:2004, SANS 15875-3:2004, SANS 15875-5:2004.

2 Definitions and special requirements

Through the application of this Specific Rules, it is possible to obtain the N Mark certification for the following products:

— Crosslinked polyethylene (PEX) pipes, in conformity with the indicated in part 2 of the applicable standards

— Crosslinked polyethylene (PEX) fittings and other plastics materials in conformity with the indicated in part 3 of the applicable standards

— Crosslinked polyethylene (PEX) piping systems in conformity with the indicated part 5 of the applicable standards, consisting of PEX pipes and fittings or PEX pipes and fittings made of other plastic or metallic materials

In order to grant the certificate for the system, it is necessary that both pipes and fittings which are part of the systems have the N Mark product certificate previously, with the exception of those systems in which the fittings have a metal body, where it will be possible to certify the system but not the fittings.

The certification applicants shall submit and independent application for each product.

Reference: For pipes is a pipe with one diameter and one nominal wall thickness. For fittings, is each figure with its dimensions.

Clients of the N Mark for the products listed in these specific rules, will comply with the RD 140/2003 Transposition of Community Directive 98/83/CE through migration tests according to UNE-EN 12873-1 Standard, performed every five years. This requirement not applies when it is identified on the marking that the pipes are for applications of underfloor heating systems, low temperature radiators and high temperature radiators, corresponding to the application class 4 and 5.

Regarding fittings, the following dimension groups are considered:

- **Group 1:** nominal diameter 16 ≤ DN ≤ 32
- **Group 2:** nominal diameter 40 ≤ DN ≤ 63
- **Group 3:** nominal diameter DN ≥ 75

Minimum admission range for fittings:

When applying for certification for PEX systems, the following fittings are established as necessary to form a system:

- Socket
- Elbow 90°
- Equal Tee
- Straight Female
- Straight male
- End cap
- Reducer / enlargement

When the range of certified products or to be certified includes just fittings of Group 1, the minimum range will include all previous references in diameters 16, 20, 25 and 32.

When the range of certified products or to be certified includes fittings of Groups 2 and 3, the minimum range will include all previous references in at least one of the diameters of the group.

3 Sampling and testing for granting and maintaining the product N Mark certificate

3.1 Test to be carried out in factory (See RP 01.00)

During initial or surveillance inspection, AENOR will carry out the test indicated in table 1 (pipes).

3.2 Sampling and tests to be carried out by the laboratory (See RP 01.00)

AENOR will select and marked the necessary samples to carry out in the laboratory the test indicated in table 1 (pipes), 2 (fittings), and 3 (system) where required.

The manufacturer will send the selected samples to the laboratories indicated by the AENOR, within 7 days since the date of the inspection.

TABLE 1

PIPES			
	TEST	GRANTING/ MAINTANING	RESULTS EVALUATION
TESTS TO BE CARRIED OUT BY THE INSPECTOR IN THE FACTORY	Appearance	10 pipes randomly	1
	Mean outside diameter	1 pipe per reference, minimum 10 pipes	2
	Wall thickness	1 pipe per reference minimum 10 pipes	3
TESTS TO BE CARRIED OUT BY THE LABORATORY	Opacity, if declared	1 reference selecting the one whit the lowest wall thickness	1
	Longitudinal reversion	20% references / mín.2, máx. 4	1
	Crosslinking degree (1)	5 references	1
	Resistance to internal pressure 20°C 1 h	20% references / mín. 2, máx. 4	1
	Resistance to internal pressure 95°C 1 h	1 reference randomly	1
	Resistance to internal pressure 95°C 22 h	20% references / míni. 2, máx. 4	1
	Resistance to internal pressure 95°C 165 h	20% references / mín. 2, máx. 4	1
	Resistance to internal pressure 95°C 1000 h	1 reference randomly	1
	Thermal stability test by hydrostatic pressure testing (only granting and in case of any formulation change) (2)	1 reference for each raw material	1

Note (1) For PEX-b pipes, if the result of the crosslinking test is not conform, and the Company requests the repetition of test, the repetition will be carry out with samples that are available in the laboratory. In this case the manufacturer will not send samples to the laboratory signed by the inspector during the inspection visit.

Note (2) In order to grant the certificate it is not considered necessary that thermal stability test by hydrostatic pressure had finished taking into account the duration of the test.

TABLE 2

FITTINGS			
	TEST	GRANTING/ MAINTANING	RESULTS EVALUATION
TESTS TO BE CARRIED OUT BY THE LABORATORY	Chemical composition of the body of the fitting (only for metallic fittings)	5% ref/ min 2	1
	Resistance to internal pressure 20°C 1 h (only plastics fittings)	5% references per type of joint min.2, max.5	1

TABLE 3

SYSTEMS			
	TEST	GRANTING/ MAINTANING	RESULTS EVALUATION
TESTS TO BE CARRIED OUT BY THE LABORATORY	Resistance to internal pressure 95°C 1000 h	2% references per type of joint min. 2, max. 5	1
	Bending test	50% of the diameters	1
	Pull-out test (23°C and 80, 90 or 95°C 1h)	50% of the diameters	1
	Thermal cycling test	1 diameter	1
	Pressure cycling test	50% of the diameters	1
	Vacuum test	50% of the diameters	1

4 Manufacturer internal control

4.1 Raw materials for pipes and fittings

The manufacturer must guarantee that the mixtures, compounds and alloys involved in the manufacture of pipes and fittings have appropriate characteristics. In addition, will assure that the specifications provided in the Certificate of Analysis, comply with the purchase requirements established and that these are the compounds and alloys declared in the application forms of as raw materials.

For metallic fittings, brass parts must comply with the alloys included in the standards:

— Fittings for machining: UNE EN 12164 Rod for free machining.

— Fittings for forging: UNE EN 12165 Semiproducts for forge.

— Fittings manufactured from hollow bars: UNE EN 12168 Hollow Bars for machining.

— Ingots and casting: UNE EN 1982.

Temporarily, and while new revisions of European standards with respect to copper alloys for brass fittings are published, the alloys listed in the following document are allowed: "Common Approach. Metallic materials part B: Common composition 4MS list".

https://www.umweltbundesamt.de/sites/default/files/medien/374/dokumente/150120_4ms_scheme_for_metallic_materials_part_b.pdf

4.2 Final products control

Tests and their frequency are stated in tables 4, 5 and 6, as proceed.

TABLE 4

PIPES	
TEST	FREQUENCY
Appearance	Every 4 hours per extrusion line
Mean outside diameter	Every 4 hours per extrusion line
Wall thickness	Every 4 hours per extrusion line
Opacity (only if manufacturer declares it)	Once per year per compound, on the one with the lowest wall thickness
Longitudinal reversion	Per manufacturing period. Minimum twice per week.
Thermal stability test by hydrostatic pressure testing	At granting and in case of any formulation change
Crosslinking degree	Per manufacturing period. Minimum twice per week
Resistance to internal pressure 20°C 1	Once per year per reference
Resistance to internal pressure 95°C 1	Once per year per extrusion line
Resistance to internal pressure 95°C 22 h	Once every two weeks per extrusion line
Resistance to internal pressure 95°C 165 h	Once every two weeks per extrusion line
Resistance to internal pressure 95°C 1000 h	One pipe per extrusion line, minimum once per year

TABLE 5

FITTINGS	
TEST	FREQUENCY
Appearance	According to the manufacturer´s internal procedure
Dimensional verification	According to the manufacturer´s internal procedure
Chemical composition, in case of the manufacturer of the fitting produces the raw material (metallic fittings)	1 fitting for each raw material batch
Chemical composition, in case of the manufacturer of the fitting does not produce the raw material (metallic fittings)	Raw material certificate for each delivery batch
Resistance to internal pressure 20°C 1(only plastics fittings)	Per manufacturing period. Minimum once per week

TABLE 6

SYSTEMS	
TEST	FREQUENCY
Resistance to internal pressure 95°C 1000 h	Once every 4 months
Bending test	Once per year
Vacuum test	Once per year
Pull-out test (23°C and 80, 90 or 95°C 1h)(	Once per year
Thermal cycling test	Once per year
Pressure cycling test	Once per year

5 Marking of certified products

5.1 Marking of the pipes

The marking of the pipes will be carried out every meter. The minimum required marking of the pipe is the following:

- The word AENOR;
- N Mark logotype;
- Contract number signed with AENOR or certificate number: 001/XXX;
- The standard UNE-EN ISO 15875 and/or SANS 15875;
- Manufacturer identification, trademark;
- Material and the crosslinked system;

— External diameter and nominal wall thickness in millimetres;

— Application class(s) combined with design pressure(s);

— The word opaque (if the manufacturer declares it);

— Traceability information (code or manufacturing date).

Example:

AENOR - N - 001/XXX - UNE-EN ISO 15875 - Trademark - PEX-a - 16x1,5 - Class 1/6 ; 2/6 ; 4/8 ; 5/6 bar - Opaque - 21/5/2016

Additionally, it is permitted to mark the maximum service pressure at either 20 °C or any other temperature when the temperature is not considered malfunction temperature, according to table 1 of UNE EN 15875-1 standard.

5.2 Marking of the fitting / packaging

5.2.1 Marking of the fitting

The minimum required marking of the fitting is the following:

— Trademark;

— Nominal diameter;

— Manufacturing month and year (number or code).

5.2.2 Marking of the packaging

The minimum required marking of the fittings packaging is the following:

— The word AENOR;

— N Mark logotype;

— Contract number signed with AENOR or certificate number: 001/XXX;

— The standard UNE-EN ISO 15875 and/or SANS 15875

— Application class(s) combined with design pressure(s);

— Traceability information (manufacturing code or data).

5.3 Marking of Systems

When is reference to the N Mark Certificate of the system in commercial or other documentation, should be indicated the Application class(s) combined with design pressure(s) that appears in the N Mark Certificate.

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Annex C1

Description Questionnaire for Pipes

CLIENT:

MANUFACTURER COMPANY:

FACTORY SITE:

MATERIAL: PEX a ☐ b ☐ c ☐

STANDARD:

TRADEMARK (S):

DATE:

RANGE FOR WHICH THE MARK IS REQUESTED				
SERIE	**DIAMETERS**	**APPLICATION CLASS**	**DESIGN PRESSURE**	**OPACITY YES / NO**

Description of the raw materials used:

SUPPLIER	**REFERENCE**

For any change of these data, the client will send to the Committee secretary this descriptive questionnaire updated.

…….…… on …… of …… 20……

SIGNATURE AND STAMP OF THE MANUFACTURER

Annex C2

Descriptive Questionnaire for fittings

CLIENT:

MANUFACTURER COMPANY:

FACTORY SITE:

MATERIAL:

TYPE OF JOINT:

Pressfitting ☐

Compressión (threaded) ☐

Compression whit sliding sleeve ☐ Specify material:

Pushfitting ☐

STANDARD:

TRADEMARK(S):

DATE:

THE APPLICANT SHALL FULLFILL A QUESTIONNARIE (ANNEX C2) FOR EACH TYPE OF FITTING

FIGURE	MATERIAL / ALLOYS	INTERNAL REFERENCE OF THE MANUFACTURER	DIAMETERS	APPLICATION CLASS	DESIGN PRESSURE

For any change of these date, the client will send on duplicate to the Committee Secretary this descriptive questionnaire updated.

…….…… on …… of …… 20……

SIGNATURE AND STAMP OF THE MANUFACTURER

Annex C3

Descriptive Questionnaire for pipes and fittings systems

CLIENT:

PIPES MANUFACTURER COMPANY:

FITTINGS MANUFACTURER COMPANY:

PRODUCT: SYSTEM FOR HOT AND COLD WATER INSTALLATIONS IN PEX

TYPE OF JOINT:

Pressfitting ☐

Compression (threaded) ☐

Compression whit sliding sleeve ☐ Specify material:

Pushfitting ☐

TRADEMARK(S):

Must be attached instructions to the application for correct assembly of the system and tool to be used, indicating the type of clamp.

DATE:

For any modification of these data, the client shall send on duplicate to the Committee Secretary this updated descriptive questionnaire.

…….…… on …… of …… 20……

SIGNATURE AND STAMP OF THE MANUFACTURER