



## **AENOR N Mark Specific Rules for polybutylene (PB) systems for hot and cold water installations**

Note: This document is a translation of the Spanish document RP 001.18 rev. 9 approved by the Plastics Technical Certification Committee (CTC-001). Spanish version always prevails over this translation.

### **RP 001.18**

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## 1 Purpose and scope

Pursuant to paragraph 3.2 of the General Rules on the Certification of Products and Services **with N Mark**, hereafter the General Rules, the present Specific Rules describe the specific certification scheme for polybutylene (PB) systems for hot and cold water installations. The present Specific Rules complete the AENOR **N Mark** Specific Rules for plastic materials - common requirements (RP 001.00). The General Rules always prevail over the present Specific Rules.

The **N Mark** for polybutylene (PB) systems for hot and cold water installations, hereafter the Mark, denotes product compliance with the following standards UNE-EN 15876-1:2017, UNE-EN ISO 15876-2:2017, UNE-EN ISO 15876-3:2017, UNE-EN ISO 15876-5:2017, SANS 15876-1:2005, SANS 15876-2:2005, SANS 15876-3:2005, SANS 15876-5:2005.

## 2 Definitions and special requirements

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

- PB-R or PB-H pipes, in conformity with the established in part 2 of the applicable standards.
- PB-R or PB-H fittings and other plastics materials in conformity with that it is established in part 3 of the applicable standards.
- Plastics piping systems in PB-R or PB-H, in conformity with that it is established in the part 5 of the applicable standards, comprised by pipes and fittings made of one of PB-R or PB-H material, or PB-R or PB-H pipes and fittings made of other plastic or metallic materials.

In order to possess a certified piping system it is necessary that both pipes and fittings that comprise it possess the **product N Mark** certificate.

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

**Reference:** It is considered a reference the set of pipes that have the same diameter and nominal wall thickness, and in the case of fittings the set of them that have the same nominal dimensions and shape.

**Clients** of the Mark for the products listed in this Particular Rules, pending the adoption of standard European test of the effect on water quality of these products, **clients** should 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.

Respect to the fittings are considered the following dimension group:

- **Group 1:** Nominal diameter  $16 \leq DN \leq 32$
- **Group 2:** Nominal diameter  $40 \leq DN \leq 63$
- **Group 3:** Nominal diameter  $DN \geq 75$

#### **Minimum admission range for fittings:**

When applying for certification for PB fittings and systems, the following figures are established as necessary for the realization of a system:

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

When the range certified or certified includes only Group 1 fittings, the minimum range shall consist of all previous references in diameters 20, 25 and 32.

When the certified or certified range includes fittings of Groups 2 and 3, the minimum range shall consist of all previous references in at least one of the group diameters.

## 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)

AENOR will carry out the test indicated in table 1 (pipes), 2 (fittings) or 3 (system) where required, during the initial or surveillance inspection.

### 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) or 3 (system) where required.

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

TABLE 1

PIPES			
TESTS TO BE CARRIED OUT BY THE INSPECTOR IN THE FACTORY	TEST	GRANTING / MAINTANING	RESULTS EVALUATION
	Appearance	10 pipes at random	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 with the lowest wall thickness	1
	Longitudinal reversion	20% references / mín 2, máx. 4	1
	Melt flow rate (compound + pipe) (1)	1 reference	1
	Resistance to internal pressure 20°C 22 h	20% references / mín. 2, máx.4	1
	Resistance to internal pressure 95°C 22 h	20% references / mín. 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 at random	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)** When the raw material is pigmented by the manufacturer of the PP pipes or fittings, then the melt mass flow rate test will not be required.

**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 INSPECTOR IN THE FACTORY	Appearance	1 fitting per diameter	1
	Dimensional test (2)	5% references / min 10	
TESTS TO BE CARRIED OUT BY THE LABORATORY	Chemical composition of metallic insert	5% references / min 2	1
	Opacity, if declared	1 reference selecting the one with the lowest wall thickness	1
	Resistance to internal pressure 20°C 22 h (only plastics fittings)	5% references per type of joint min. 2, max.5	1
	Melt flow rate (compound + fitting) (1)	5 reference	1

**Note (1)** When the raw material is pigmented by the manufacturer of the PB pipes or fittings, then the melt mass flow rate test will not be required.

**Note (2)** For those fittings that dimensions are standardized by the type of joint used.

TABLE 3

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

**Note (1)** These functional tests will be done for those types of joints which are applicable. As a general rule:

- For the systems comprised by fittings which type of joint is mechanical, it will be necessary to carry out the entire applicable test defined in table 3 marked with note 1.
- In case of electrofusion or socket fusion it only will be necessary to carry out the thermal cycling test and resistance to internal pressure test.

## 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 and be manufactured with 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 as new revisions of European standards with respect to copper alloys for brass fittings is published, it allows the aforementioned alloys, those listed in "Common Approach" allowed, "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](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
Melt flow rate (compound + pipe) (1)	Every three batches of raw material
Resistance to internal pressure 20°C 1 h	Once per year per reference
Resistance to internal pressure 20°C 22 h	Once per year per reference
Resistance to internal pressure 95°C 22 h	Once per manufacturing period
Resistance to internal pressure 95°C 165 h	Every three manufacturing periods of the same reference
Resistance to internal pressure 95°C 1000 h	One pipe per extrusion line, minimum once per year

**Note (1)** When the raw material is pigmented by the manufacturer of the PP pipes or fittings, then the melt mass flow rate test will not be required.

TABLE 5

FITTINGS	
TEST	FREQUENCY
Appearance	Every 8 hours per machine and cavity
Dimensional test (2)	Per manufacturing period. Minimum every 24 hours
Chemical composition of metallic insert	Raw material certificate for each delivery batch
Opacity (only if manufacturer declares it)	Once per year per compound, on the one with the lowest wall thickness
Melt flow rate (compound + fitting) (1)	Every three batches of raw material
Resistance to internal pressure 20°C 1 h	Once per manufacturing period. Minimum once per week
Resistance to internal pressure 20°C 22 h	Once per manufacturing period. Minimum once per week

**Note (1)** When the raw material is pigmented by the manufacturer of the PB pipes or fittings, then the melt mass flow rate test will not be required.

**Note (2)** For those fittings that dimensions are standardized by the type of joint used.



TABLE 6

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

**Note (1)** These functional tests will be done for those types of joints which are applicable. As a general rule:

- For the systems comprised by fittings which type of joint is mechanical, it will be necessary to carry out the entire applicable test defined in table 6, marked with note 1.
- In case of electrofusion or socket fusion it only will be necessary to carry out the thermal cycling test and resistance to internal pressure test.

## 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:

- Reference to the word: AENOR;
- N Mark logotype;
- Contract number signed with AENOR or certificate number: 001/XXX;
- Number of the applicable standard UNE-EN ISO 15876 and or SANS 15876;
- Manufacturer identification, trademark;
- The reference to the material;
- Indication of the external diameter and nominal wall thickness in millimeters;
- Application class(s) combined with design pressure(s);
- Reference to the word opaque (if the manufacturer declares it);
- Manufacturer's information (manufacturing code or data).

## Example

AENOR - N - 001/XXX - UNE-EN ISO 15876 - Trade mark - PB - 16x2,2 - Class - 1/10 - 2/10 - 4/10 ; 5/10 bar - Opaque - 21/5/2016

## 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:

- Reference to the word: AENOR;
- N Mark logotype;
- Contract number signed with AENOR or certificate number: 001/XXX;
- Number of the applicable standard UNE-EN ISO 15876-3 and or SANS 15876;
- Application class(s) combined with design pressure(s);
- Reference to the word opaque (if the manufacturer declares it);
- Manufacturer's information (manufacturing code or data).

## 5.3 Marking of Systems

Where reference is made to the **N Mark** certificate of the system in commercial or other documentation, indicate the type of application and pressure that appears in the AENOR Certificate.

## Annex C1

### Description Questionnaire for Pipes

**CLIENT:**

MANUFACTURER COMPANY:

FACTORY SITE:

MATERIAL: PB-R ☐ PB-H ☐

STANDART:

TRADEMARK(S)

COLOR:

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** company will send to the Committee secretary this descriptive questionnaire updated.

..... on ..... of ..... 20.....

**SIGNATURE AND STAMP OF THE MANUFACTURER**

## Annex C-2

### Descriptive Questionnaire for fittings

**CLIENT:**

MANUFACTURER COMPANY:

FACTORY SITE:

PRODUCT: FITTINGS FOR PB PIPES

MATERIAL: PB-R ☐ PB-H ☐

TYPE OF JOINT:

Socket fusion ☐ Electrofusion ☐ Mechanical ☐

STANDARD:

TRADEMARK(S):

DATE:

**THE APPLICANT SHALL FILL IN A QUESTIONNAIRE (ANNEX C-2) FOR EACH FITTING TYPE**

FIGURE	MATERIAL / ALLOYS	REFERENCE INTERNAL OF THE MANUFACTURER	DIAMETERS	APPLICATION CLASS	DESIGN PRESSURE	OPACITY YES/NO

Description of the raw materials used:

Fitting body:

SUPPLIER	REFERENCE

Alloys declared for metallic insert.

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 PB

TYPE OF JOINT:

Socket fusion ☐      Electrofusion ☐      Mechanical ☐

STANDARD:

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**