AENOR
Confía

# AENOR Mark N Specific Rules for Polyethylene Pipes (PE) for water supply and sewerage under pressure

Note: This document is a translation of the Spanish document RP 001.01 rev. 24, approved by the Plastics Technical Certification Committee (CTC-001). Spanish version always prevails over this translation.

## RP 001.01


Revision 24
InternalCode 02-RP-0476.00
Date 2025-05-20

# Index

# 1 Object 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 plastics Polyethylene (PE) pipes to be used for water supply intended for human consumption, including the conveyance of raw material prior to treatment, drainage and sewerage under pressure, vacuum sewer systems, and water for other purposes. 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 plastics Polyethylene (PE) to be used for water supply intended for human consumption, including the conveyance of raw material prior to treatment, drainage and sewerage under pressure, vacuum sewer systems, and water for other purposes, hereafter the N Mark, denotes product compliance with the UNE EN 12201-1:2024 V2, UNE-EN 12201-2:2024 or ISO 4427-2:2019 .

# 2 Definitions and special requirements

**Series:** It is considered as the set of pipes produced for the same nominal pressure

**Class:** It is called a class of pipes to the set of the same ones that have the same diameter and nominal dimensions.

The following types are distinguished according to the material:

- PE 40 pipes
- PE 80 pipes
- PE 100 pipes
- PE 100 RC pipes (Except ISO 4427-2)

Depending on the wall construction, the following types are distinguished:

- PE pipes including any identification band.
- PE pipes with coextruded layers
- PE pipes with a peelable layer

A pipe can only be designated PE 100-RC pipe if it is manufactured from PE 100-RC materials certified by AENOR and meets the requirements specified in tables 1 and 2 of this specific rules. A co-extruded pipe manufactured from a combination of PE 100 and PE 100-RC layers must be considered PE 100 and marked accordingly.

**Expected use:**

- W For pipes intended for water supply for human consumption
- P For pipes intended for sewer and drainage under pressure
- W/P For mixed use

**Dimensional group:** The following diameter groups are considered:

- Group 1: Nominal outer diameter nd < 75
- Group 2: Nominal outer diameter 75 ≤ nd < 250
- Group 3: Nominal outer diameter 250 ≤ nd < 710
- Group 4: Nominal outer diameter 710 ≤ dn < 1800
- Group 5: Nominal outer diameter 1800 ≤ dn ≤ 3000

The client applying for AENOR N Mark for products manufactured in accordance with UNE EN 12201 shall request it for all types of pipes manufactured covered by this standard. PE 63 pipes are excluded from the scope of certification in accordance with ISO 4427-2.

At the same time, for polyethylene (PE) pipes for water supply intended for human consumption, pending the adoption of the European criterion of verification of the effect on water quality of these products, the client will provide to AENOR, during the inspection visit, that he has evidences that the product complies with RD 3/2023, either through migration tests in accordance with the UNE EN 12873 standard carried out every 5 years and/or certificates issued by qualified bodies.

In Spain the use of PE 40 pipes with diameter up to even included is allowed.90 mm

In Spain the preferences regarding the colour of the pipes according to their application will be:

- Pipes intended for water supply for human consumption must be black with blue bands or blue;

- Pipes for sewer, drainage and other applications must be black or black with brown band;
- Pipes for the conduction of regenerated water shall be black with a purple band.
- For applications other than the mentioned above, the pipes may be black or banded in different colours from the one mentioned above.

In other countries, preferences for the colour of the pipes will be those listed in the relevant national prologues.

# 3 Sampling and testing for granting and maintenance of the product N Mark certificate

## 3.1 Testing to be carried out in factory (See RP 001.00)

AENOR will carry out the test indicated in table 1, for each type where required, during the initial or surveillance inspection.

## 3.2 Sampling and testing to be carried out in the laboratory (See RP 01.00)

AENOR will carry out the test indicated in table 1, for each type where required, during the initial or surveillance inspection.

| | TEST | GRANTING/MAINTAINING | RESULTS EVALUATION (*) |
|---|---|---|---|
| TESTS TO BE CARRIED OUT BY THE INSPECTOR IN THE FACTORY | Appearance and design | 1 pipe per class | 1 |
| | Nominal outside diameter | 1 pipe per class | 2 |
| | Wall thickness | 1 pipe per class | 3 |
| | Layer thickness (coextruded pipes only) (See Note 2) | 1 pipe per class | 3 |
| | Ovality (see note 1) | 1 pipe per diameter | 2 |
| | Inner diameter of the coil | 1 coil per diameter | 2 |
| TESTS TO BE CARRIED OUT BY THE LABORATORY | Elongation at breakage | 10% classes<br>Minimum 2 classes,<br>Maximum 5 classes | 1 |
| | Melt flow rate (see note 3) | 1 random pipe | 1 |
| | Oxidation induction time or Thermal stability (only for co-extruded pipes (see note 3) | 1 random pipe | 4 |
| | Hydrostatic effort 100 hours 20°C | 10% classes<br>Minimum 2 classes, Maximum 5 classes | 1 |
| | Hydrostatic effort 165 hours 80°C | 10% classes<br>Minimum 2 classes,<br>Maximum 5 classes | 1 |
| | Hydrostatic effort 1000 hours 80°C | 1 class every 5 years | 1 |
| | Longitudinal retraction for e < 16 mm (sees note 4) | 10% classes<br>Minimum 2 classes,<br>Maximum 5 classes<br>3 test tube | 1 |
| | Circumferential reversion | 1 test for group 3 and 4 to concession and every 5 years | 1 |
| | Rapid propagation of cracks (coextruded pipes only) | 1 test to concession and every 2 years for combination of materials | 1 |
| | Slow propagation of cracks (coextruded pipes only) | 1 test per combination of materials | 1 |
| | Delamination (coextruded pipes only) | Visual observation after each trial | 1 |
| | Structure integrity (co-extruded pipes only) | 1 test per dimensional group | 1 |
| | Coating adhesion (peelable pipes only) | Verification before each trial | 1 |
| | Resistance to SCG PE 80 and PE 100 Pipes<br>Accelerated Notched Pipe Test (ANPT)<br>Except ISO 4427-2 | 1 test per type of material (PE 80 or PE 100) to concession and every 5 years | 1 |
| | Resistance to SCG PE 100-RC Pipes. Accelerated Notched Pipe Test (ANPT) (see note 5. 6 and 7)<br>Except ISO 4427-2 | 1 test of group 2 to concession and every 5 years | 1 |
| | Resistance to SCG PE 100-RC Pipe. Strain-Hardening Test (STH) (see note 3 and 5)<br>Except ISO 4427-2 | 1 test of group 1 to concession and every 5 years | 1 |
| | Resistance to SCG PE 100-RC Pipe. Cracked Round BarTest (CRB). (see note 5)<br>Except ISO 4427-2 | 1 test of group 1 to concession and every 5 years | 1 |

**TABLE 1**

**(*)** The evaluation criteria of this table are described in section 7.6, evaluation test results, of RP 001.00.

**Note 1)** The ovulation of the pipes presented in coils is not usually, at the ends, higher than that indicated in Table 1 of the UNE EN 12201-2 standard, so, in these cases, the union between those sections of the coils , through any of the commonly used joining systems, does not present any problems.

However, the ovulation outside the above-mentioned ends zones can be much higher than that indicated in Table 1, increasing as the wall thickness of the pipe decreases. Therefore, for the union of sections of cut pipes inside a roll, it will be essential to condition them properly, with the help of a suitable tool, in order to eliminate excess of ovoid up to permissible levels, for a good adaptation to the joining elements.

**Note 2)** For co-extruded pipes the manufacturer shall declare the thickness of each layer and the tolerance.

**Note 3)** For coextruded pipes should be made to each layer.

**Note 4)** For co-extruded pipes, co-extruded layers should be applied.

Note 5) These tests are specific for PE 100-RC materials. The SHT is intended to be used for dimension group 1, the ANPT for dimension group 2 and the CRB test for dimension groups 3, 4 or 5, see Technical Specification CEN/TS 12201-7 [3]. As noniphenol ethoxylate is currently not available in certain markets, SHT can be used for dimension group 2 as an alternative test until a requirement has been defined using a new detergent for ANPT.

**Note 6)** Suspended as long as there is no valid correlation between the test conditions/specifications with the new detergent (Dehyton PL) and the current one (Arkopal N100).

**Note 7) During all the tests of the coextruded pipe, no delamination should have occurred.**

# 4 Manufacturer's internal control

## 4.1 Characteristics under factory production control (See RP 001.00)

All the characteristics under factory production control stated in this paragraph are referred to each type of polyethylene pipes.

**Raw materials:** The polyethylene compounds used to produce pipes must have the corresponding product N Mark certificate.

**Controls during manufacture and on the final product:** The tests and the frequency thereof are listed in Table 2.

| TEST | FREQUENCY |
|---|---|
| Appearance and design | Every 4 hours / extrusion line |
| Nominal outside diameter | |
| Wall thickness | |
| Layer thickness (coextruded pipes only) (See Note 2) | |
| Ovality (see note 1) | |
| Inner diameter of the coil | By manufacturing period, at the beginning of the period |
| Verification of compounds used for identification bands | According to the manufacturer's internal procedure |
| Elongation at breakage | By manufacturing period, minimum once per week |
| Melt flow rate (see note 3) | Every three manufacturing periods per class |
| Oxidation induction time or Thermal stability (only for co-extruded pipes (see note 3) | Every six months, by supplier of raw material on the tube |
| Hydrostatic effort 100 hours 20°C | 50% of classes manufactured per year<br>Minimum number of test tubes: 2 |
| Hydrostatic effort 165 hours 80°C | Once a year per class. Minimum number of test tubes: 2 |
| Hydrostatic effort 1000 hours 80°C | Once a year about a class.<br>Minimum number of test tubes: 2 |
| Longitudinal retraction for e < 16 mm (sees note 4 ) | Once a year per class. 3 test tubes |
| Circumferential reversion | 1 time per year (groups 3 or 4) |
| Rapid propagation of cracks (coextruded pipes only) | Every 2 years per combination of materials |
| Slow propagation of cracks (coextruded pipes only) | 1 time a year per combination of materials |
| Delamination (coextruded pipes only) | Visual observation after each trial |
| Structure integrity (co-extruded pipes only) | Once a year per class |
| Coating adhesion (peelable pipes only) | Verification before each trial |

| | |
|---|---|
| Resistance to SCG PE 80 and PE 100 Pipes<br>Accelerated Notched Pipe Test (ANPT)<br>Except ISO 4427-2 | According to the manufacturer's internal procedure |
| Resistance to SCG PE 100-RC Pipes. Accelerated Notched Pipe Test (ANPT) (see note 5. 6 and 7)<br>Except ISO 4427-2 | According to the manufacturer's internal procedure |
| Resistance to SCG PE 100-RC Pipe. Strain-Hardening Test (STH) (see note 3 and 5)<br>Except ISO 4427-2 | According to the manufacturer's internal procedure |
| Resistance to SCG PE 100-RC Pipe. Cracked Round BarTest (CRB). (see note 5)<br>Except ISO 4427-2 | According to the manufacturer's internal procedure |

TABLE 2

**Note 1)** The ovulation of the pipes presented in coils is not usually, at the ends, higher than that indicated in Table 1 of the UNE EN 12201-2 standard, so, in these cases, the union between those sections of the coils , through any of the commonly used joining systems, does not present any problems.

However, the ovulation outside the above-mentioned ends zones can be much higher than that indicated in Table 1, increasing as the wall thickness of the pipe decreases. Therefore, for the union of sections of cut pipes inside a roll, it will be essential to condition them properly, with the help of a suitable tool, in order to eliminate excess ovulation up to permissible levels, for a good adaptation to the joining elements.

**Note 2)** For co-extruded pipes the manufacturer shall declare the thickness of each layer and the tolerance.

**Note 3)** For coextruded pipes should be made to each layer.

**Note 4)** For co-extruded pipes, co-extruded layers should be applied.

Note 5) These tests are specific for PE 100-RC materials. The SHT is intended to be used for dimension group 1, the ANPT for dimension group 2 and the CRB test for dimension groups 3, 4 or 5, see Technical Specification CEN/TS 12201-7 [3]. As noniphenol ethoxylate is currently not available in certain markets, SHT can be used for dimension group 2 as an alternative test until a requirement has been defined using a new detergent for ANPT.

**Note 6)** Suspended as long as there is no valid correlation between the test conditions/specifications with the new detergent (Dehyton PL) and the current one (Arkopal N100).

**Note 7) During all the tests of the coextruded pipe, no delamination should have occurred.**

## 5 Marked of certified products (see RP 001.00)

The marking on the pipes shall include at least the following:

— Reference to the word AENOR;

— N Mark logotype with a size not less than 5 mm;

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

— Reference to the standard UNE EN 12201 and/or ISO 4427;

— Name or trademark of the manufacturer;

— Dimensions (ND x WT);

— SDR Series;

— Intended use (W, P or W/P);

— Material and designation (PE 40, PE 80, PE 100), PE 100-RC (except ISO 4427-2);

— Pressure range, in bar;

— Manufacturer information;

— Type of tube (if applicable): co-extruded or peelable layer(s) (the marking on these pipes should be applied to the coating).

The pipes shall be marked at least every meter.

**Example:**

AENOR - N - 001/XXX - ONEEEN 12201-2 - trademark - 110x10 - SDR 11 - W - PE 100 - PN 16 - lot 4857 - intended use - tube type

# Annex C

# Descriptive Questionnaire for PE Pipes

CLIENT:

MANUFACTURER COMPANY:

FACTORY SITE:

PRODUCT:

MATERIAL: PE 40____ PE 80____ PE 100___ PE 100-RC (except ISO 4427-2) __

STANDARD:

TRADEMARK(S):

DATE:

| RANGE FOR WHICH YOU APPLY FOR THE BRAND | | |
|---|---|---|
| **DIMENSIONS (DN x en)** | **NOMINAL PRESSURE (bar)** | **PREVIOUS USE (W, P, W/P)** |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

For any modification of the data indicated, the client shall send this updated descriptive questionnaire to the Committee Secretariat.

…….…… on …… of …… 20……

**SIGNATURE AND STAMP OF THE MANUFACTURER**

# Annex C1

## Descriptive Questionnaire for PE pipes with co-extruded layer(s) or peeling layer

CLIENT:

MANUFACTURER COMPANY:

FACTORY SITE:

PRODUCT:

MATERIAL: PE 40____ PE 80____ PE 100___ PE 100-RC (except ISO 4427-2) __

WALL CONSTRUCTION: - PE pipes including any identification band

- COEXTRUED LAYERS: _____
- PEELABLE CAPA: _____ Specify material: _____

STANDARD:

TRADEMARK(S):

DATE:

| RANGE FOR WHICH YOU APPLY FOR THE BRAND | | |
|---|---|---|
| **DIMENSIONS (DN x en)** | **NOMINAL PRESSURE (bar)** | **EXPECTED USE (W, P, W/P)** |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| REFERENCE RAW MATERIAL OF EACH LAYER | Supplier |
|---|---|
| | |
| | |
| | |
| | |

| DIMENSIONS OF EACH CAP: include tolerances | | | | | | |
|---|---|---|---|---|---|---|
| **Dimensions (DN / PN)** | **e1 Internal** | **e2 Intermediate** | **e3 External** | **D interior** | **D Intermediate** | **D total** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

For any modification of the data indicated, the client shall send this updated descriptive questionnaire to the Committee Secretariat.

…….…… on …… of …… 20…..…

**SIGNATURE AND STAMP OF THE MANUFACTURER**