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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. 23, approved by the Plastics Technical Certification Committee (CTC-001). Spanish version always prevails over this translation.

RP 001.01

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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 12201-1:2012, UNE-EN 12201-2:2012+A1:2020 or ISO 4427-2: 2007 and complying with the requirements established in RD 140/2003 regarding the effect on water quality of these products.

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 compounds
- PE compounds
- PE 100 compounds

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

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 ≤ nd < 1400
- Group 5: Nominal outer diameter 1400 ≤ nd ≤ 2500

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) fittings 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 140/2003. Therefore, the product does not contain any of the substances listed in Annex 1 of the mentioned document.

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

In Spain the preferences regarding the color 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.

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 Minimum 2 classes, 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 Minimum 2 classes, Maximum 5 classes	1
	Hydrostatic effort 165 hours 80°C	10% classes Minimum 2 classes, 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 Minimum 2 classes, Maximum 5 classes 3 test tube	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

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.

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
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 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. Minimum number of test tubes: 2
Longitudinal retraction for e < 16 mm (sees note 4)	Once a year per class. 3 test tubes
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

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.

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);

— 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____

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……

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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____

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