



AENOR N Mark Specific Rules for polyethylene compounds (PE) for the manufacturing of pipes for gaseous fuels

Note: This document is a translation of the Spanish document RP 01.37 rev. 12 approved by the Plastics Technical Certification Committee (CTC-001). Spanish version always prevails over this translation.

RP 001.37

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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 polyethylene compounds (PE) for the manufacturing of pipes for the supply of gaseous fuels. 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 polyethylene compounds (PE) for the manufacturing of pipes for the supply of gaseous fuels, hereafter the Mark, denotes product compliance with the UNE-EN 1555-1-:2022 and/or ISO 4437-1:2024.

2 Definitions and special requirements

The client of the N Mark Certificate for any polyethylene compound must send, the application form and the reference curves for the product.

Type:

- PE 80
- PE 100
- PE 100-RC

Compound: Homogenous mixture of base polymer (PE) and additives, i.e., anti-oxidants, pigments, UV-stabilisers and others, at a dosage level necessary for the processing and use of components complying with the requirements of the Standard UNE-EN 1555-1:2022 and/or ISO 4437-1:2024.

Production batch: Quantity clearly identifiable and homogeneous of compound produced under uniform conditions. The production batch is defined and identified by the manufacturer.

The client is required to communicate to the Committee, any change that should concern the compound, according to Annex A of the CEN/TS 1555-7.

3 Sampling and testing for granting and maintaining the Product N Mark Certificate

3.1 Sampling and test to be carried out by the laboratory (See RP 001.00)

AENOR will select and mark the necessary samples to carry out in the laboratory the tests stated in table 1 for each compound.

3.2 Test results valuation

The test criterion valuation will be as follows. Test results must comply with the requirements of the standard. In consequence, no value will be allowed to be out of tolerances.

	TESTS	GRANTING/MAINTAINING	RESULTS EVALUATION
TESTS TO BE CARRIED OUT BY THE LABORATORY	Compound density (1)	One per compound	1
	Oxidation induction time	One per compound	1
	Melt mass-flow rate	One per compound	1
	Volatile Content	One per compound	1
	Water content (2)	One per compound	1
	Carbon black content	One per compound	1
	Carbon black dispersion	One per compound	1
	Pigment dispersion	One per compound	1
	Resistance to slow crack growth (SCG). Strain-Hardening Test (SHT) Only compound PE 100-RC.	One per compound	1
	Resistance to slow crack growth (SCG). Accelerated Full Notch Creep Test (AFNCT) (3) Only compound PE 100-RC.	One every two years per compound	1
	Resistance to slow crack growth Cracked Round Bar Test (CRB). Only compound PE 100-RC	One every two years per compound	1
	Resistance to gas condensate	Type test	1
	Resistance to weathering	Type test	1
	Resistance to rapid crack propagation	One every two years per compound	1
	Resistance to slow crack growth Only compound PE 80 y PE 100	Once per compound	1
	(*) Resistance to slow crack growth Accelerated Notched Pipe Test (ANPT) (4) Only compound PE 100-RC	Once per compound (DN110 SDR11)	1
	Tensile strength for butt-fusion (DN110 SDR11)	Once per compound at the granting and every five years	1

TABLE 1

Note (1): In case of litigation, to perform this test must take into account, as mentioned in Note 1 of ISO 1183-2, the conditions for prepare the samples set out in the corresponding material specification and indicated by the manufacturer. This preparation must be realized in any of the conditions described in Table 3 (compression molding) and table 4 (extruded obtained according to ISO 1133-1) of ISO 17855-2.

Note (2): Only applicable, if the measured volatile content is not in conformity with its specified requirement. In case of dispute the requirement for water content shall apply. An alternative test method, ISO 760:1978(4) may be used.

Note (3): If the client of the certificate has a previous test (Type test) carried out on 8 specimens (according to section 8.2 of the test standard ISO 16770), the minimum number of specimens for the AFNCT test, both in concession and follow-up, shall be 4 specimens, one for each level of stress indicated in the standard, and this number may be increased in the case of very scattered results. The maximum test duration for each specimen in the absence of breakage shall be 750h".

Note (4): As no valid correlation between the test conditions/specifications with the new detergent (Dehyton PL) and the current detergent (Arkopal N100) is available, the Accelerated Notch Test (ANPT) is replaced by the Strain-Hardening Test (SHT).

The resistance to rapid crack propagation, slow crack growth (except SHT and AFNCT), resistance to weathering, resistance to gas condensate and tensile strength for butt-fusion tests must be carried out on pipe. Therefore, during the inspection in the client plant the necessary amount of compound, starting from the same production batch, to produce the pipe required in the standard shall be selected. The extrusion will carry out wherever the client stated: in his installations, if he has them available or in the installations of a pipe manufacturer. In this last case it will be preferred that the pipe manufacturer has an AENOR Certificate for PE 80 or PE 100 pipes.

AENOR shall be present during the pipe extrusion. They will carry out the extruded pipe dimensional control and will mark the samples to be sent to the approved laboratory by the client.

3.3 Change of compound

It will take into account the established in Annex A of the technical Specification CEN/TS 155-7.

4 Manufacturer internal control

4.1 Characteristics under factory production control (See RP 001.00)

All the characteristics under factory production control indicated in this paragraph have to be controlled for each type of polyethylene compound.

- **Final Product Control:** The tests and their frequency are stated in the table 2.

TESTS	FREQUENCY
Compound density	Every production batch
Oxidation induction time	
Melt mass-flow rate	
Volatile content or water content (1)	
Carbon black content	
Carbon black dispersion	
Pigment dispersion	
Resistance to slow crack growth Strain-Hardening Test (SHT) Only compound PE 100-RC.	According to the manufacturer's internal procedure
Resistance to rapid crack propagation (2)	According to the manufacturer's internal procedure
Resistance to slow crack growth Only compound PE 80 y PE 100	According to the manufacturer's internal procedure
Resistance to slow crack growth Accelerated Notched Pipe Test (ANPT) (3) (4) Only compound PE 100-RC	According to the manufacturer's internal procedure (DN110 SDR11)
Resistance to slow crack growth . Accelerated Full Notch Creep Test (AFNCT) (3) Only compound PE 100-RC.	According to the manufacturer's internal procedure
Resistance to slow crack growth Cracked Round Bar Test (CRB). Only compound PE 100-RC	According to the manufacturer's internal procedure (3)
Classification. Internal pressure test 20°C 100h and 20°C 2500h	According to the manufacturer's internal procedure
Classification. Internal pressure test 80°C 5000h	Every eight years

TABLE 2

Nota (1): Only applicable, if the measured volatile content is not in conformity to its specified requirement. In case of dispute the requirement for water content shall be used. An alternative method, ISO 760:1978(4) may apply.

Nota (2): As an internal control of the manufacturer, will be allowed to perform the test with pipes of $e \geq 15$ mm thickness.

Nota (3): Only if no follow-up has been carried out by a Certification Body in the same period.

Nota (4): As no valid correlation between the test conditions/specifications with the new detergent (Dehyton PL) and the current detergent (Arkopal N100) is available, the Accelerated Notch Test (ANPT) is replaced by the Strain-Hardening Test (SHT).

5 Marking of certified products (See RP 01.00)

Marking that may appear on the bags and in delivery notes is as follows. This marking is obligatory in the manufacturer's analysis bulletin.

- Reference to the word: AENOR.
- N Mark logotype (advisable but not compulsory).
- Certificate number: 001/XXX.
- Trademark.
- Number of the standard: UNE-EN 1555 and/or ISO 4437

Example:

AENOR - N - 001/XXX - Trademark - UNE EN 1555

If it is included in delivery notes, it should be clearly indicated which of the products included in the delivery note is certified.

Annex C

Descriptive questionnaire of the product

CLIENT:

MANUFACTURER COMPANY:

FACTORY SITE:

PRODUCT:

STANDARD:

TRADEMARK(S):

DATE:

TYPE:

PE 80

PE 100

PE 100-RC

TECHNICAL CHARACTERISTICS:

- MFR:
- DENSITY:

ADDITIONAL DOCUMENTATION TO DELIVER WITH THE APPLICATION FORM

- Conditions of the samples preparation previous to the density determination
- Dossier whit reference curves of the product and tests Table 1
- **Technical sheet of the material**

For any extension of the range, the client will send this descriptive questionnaire updated in duplicate to the Committee Secretariat, indicating the modifications. The Committee Secretariat will inform the client about the procedures to follow in each case.

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SIGNATURE AND STAMP OF THE MANUFACTURER