AENOR
Confía

AENOR N Mark Specific Rules for Unplasticized poly(vinyl chloride) (PVC-U) pipes and Modified poly(vinyl chloride) (PVC-M) pipes for pressure systems

RP 001.95

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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 unplasticized poly(vinyl chloride) (PVC-U) pipes and modified poly(vinyl chloride) (PVC-M) pipes for pressure systems. 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 unplasticized poly(vinyl chloride) (PVC-U) pipes and modified poly(vinyl chloride) (PVC-M) pipes for pressure systems denotes product compliance with the following standards: SANS 966-1:2019 and SANS 966-2:2013.

2 Definitions and special requirements

Reference: It is considering a reference the set of pipes that have the same diameter and nominal wall thickness.

Type: There are two types depending of the system of joint as follows.

- Type 0: Plain ends
- Type 1: Pipes with integral socket (glued)
- Type 2: Pipes with integral elastomeric ring seal socket.

Groups of dimensions:

The following groups of dimensions are considered depending on the diameter

- Group 1: DN <90
- Group 2: DN ≥90

When the pipes are manufactured through a coextrusion process, the manufacturer will ensure that the material used for the extrusion of the different layers is of the same formulation and comes from the same batch of mixture, not being appreciated when looking at the finished product no colour difference between layers.

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 tests indicated in table 1 during the initial or surveillance inspection.

AENOR will verify the general characteristics and, in particular, the colour of the pipes, which must be grey, blue or cream for pipes whose intended use is to supply and convey pressurized water, while said colour will be grey or brown for pipes whose intended use is underground or aerial sanitation with pressure. National requirements prevail over this ones in any case.

3.2 Sampling and tests to be carried out by the laboratory (See RP 001.00)

AENOR will select and marked the necessary samples to carry out in the laboratory the tests indicated in table 1.

	TESTS	GRANTING/ MAINTANING	CRITERION OF VALUATION
TESTS TO BE CARRIED OUT BY THE INSPECTOR IN THE FACTORY FOR PVC-U& PVC-M PIPES	Appearance	10 pipes randomly	1
	Mean outside diameter	1 pipe per reference	2
	Inner diameter of the socket	1 pipe per diameter / type	2
	Ovality	1 pipe per diameter	2
	Wall thickness	1 pipe per reference	3
	Length of socket	1 pipe per diameter (Lmin.)	2
	Effective lenght	10 pipes randomly	2
	Fracture toughness	1DN per groups of dimensions	1
	Resistance to diurnal stress/pressure fluctuations (only PVC-M)	1 reference randomly	
	Test for ductility by high-speed impact at 23 °C (only PVC-M)	1 reference randomly	1
	Tensile impact stress/strength (only PVC-M)	1DN per groups of dimensions	1
	Long-term toughness (only PVC-M)	1 reference randomly	1
TESTS TO BE CARRIED OUT BY THE LABORATORY FOR PVC-U PIPES & PVC-M pipes	Resistance to impact (external blows) at 20 °C	10% references, mín. 2	1
	Thermal reversion	10% references, mín. 2	1
	Vicat	1 reference randomly	1
	Resistance to dichloromethane (methylene chloride)	1DN per groups of dimensions	1
	Resistance to hydrostatic pressure 20° 1h	1DN per groups of dimensions	1
	Resistance to hydrostatic pressure 20° 100h	1DN per groups of dimensions	1
	Resistance to hydrostatic pressure 60° 1000h	1 reference, every 5 years	1
	Resistance to hydrostatic pressure (pipes with integral pipe-end sockets)	1DN per groups of dimensions	1
	Resistance to misalignment (pipes with integral pipe-end sockets)	1 reference randomly per type	1
	Resistance to deformation (pipes with integral pipe-end sockets)	1 reference randomly per type	1
	Resistance to vacuum (pipes with integral pipe-end sockets)	1 reference randomly per type	1
TESTS TO BE CARRIED OUT BY THE LABORATORY JUST FOR PVC-M PIPES	Resistance to hydrostatic pressure 20° 1000h	1 reference, every 5 years	1
	Tensile strenght	1 reference randomly	1
	Resistance of notched pipe to hydrostatic pressure	1 reference, every 5 years	1
	Resistance to solar radiation (weathering)	1 reference randomly	1

TABLE 1

Note : Internal pressure resistance tests for DN≥400 pipes will be carried out on a single test specimens. The internal pressure resistance tests for DN≤355 pipes will be carried out over three specimens.

4 Manufacturer internal control

4.1 Raw materials pipes

The manufacturer must ensure that the mixtures and compounds involved in the manufacture of pipes have appropriate characteristics. In the same way, the specifications provided in the Certificate of Analysis of material received, comply with established purchase requirements.

4.2 Controls on the final product:

Tests and their frequency are stated in table 2 for PVC-U pipes & PVC-M pipes

TEST	FRECUENCY
Appearance	Every 4 hours / production line
Mean outside diameter	Every 4 hours / production line
Wall thickness	Every 4 hours / production line
Ovality	Every 4 hours / production line
Length of socket	Every 4 hours / production line
Length effective	Every 4 hours / production line
Resistance to impact (external blows) at 20 °C	Per period of production/minimum twice a week
Thermal reversion	Every 8 hours / line
Fracture toughness	1DN per groups of dimensions/twice a year
Vicat	Once a year randomly
Resistance to dichloromethane (methylene chloride)	At the beginning of any production
Tensile strength (only PVC-M)	Once a year randomly
Resistance to hydrostatic pressure 20° 1h	Once per week
Resistance to hydrostatic pressure 20° 100 h	Once per year & type
Resistance to hydrostatic pressure 60° 1000h	Once per year
Resistance to hydrostatic pressure 20° 1000h (only PVC-M)	Once per year & type
Resistance to creep	According to the reference curve of the material
Freedom from toxicity	According to the certificate
Resistance to misalignment (pipes with integral pipe-end sockets)	Once per year per type
Resistance to hydrostatic pressure (pipes with integral pipe-end sockets)	1DN per groups of dimensions & type
Resistance to deformation (pipes with integral pipe-end sockets)	Once per year per type
Resistance to vacuum (pipes with integral pipe-end sockets)	Once per year per type
Resistance to diurnal stress/pressure fluctuations (pipes) (only PVC-M)	Once per year per type

Resistance of notched pipe to hydrostatic pressure (only PVC-M)	Once per year randomly
Resistance to solar radiation (weathering) (only PVC-M)	Once per year randomly
Test for ductility by high-speed impact at 23 °C (only PVC-M)	Once per year & type
Tensile impact stress/strength (only PVC-M)	Once per year per dimension group
Long-term toughness (only PVC-M)	Once per year randomly

TABLE 2

Note : It will be allowed to carry out the 1000-hour tests on a single specimen, taking into account the duration of the test, and that it is a process control test and not a product release test.

5 Marking of certified products

The marking on the pipes will include as minimum the following:

- AENOR N Mark logotype;
- Certificate number: 001/XXX;
- Manufacturer identification, trademark;
- Number of the applicable standard SANS 966-1 or SANS 966-2
- Nominal outside diameter d_n and nominal wall thickness e_n;
- Nominal Pressure (PN) bar;
- Materilal PVC-U or PVC-M;
- Manufacture's information (code or date of manufacture).

Annex C

Descriptive questionnaire for pipes

CLIENT:

PIPES MANUFACTURER COMPANY:

FACTORY SITE:

MATERIAL:

STANDARD:

TRADEMARK(S).

DATE:

RANGE FOR WHICH THE REQUESTED			
PN (Bar)	**DN (mm)**	**TYPE (0, 1, 2)**	**ELASTIC JOINT MODEL (just per type 2)**

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

…….…… on …… of …… 20……

SIGNATURE AND STAMP OF THE MANUFACTURER