TECHNICAL DOCUMENT

GRAVITY DRAINAGE SYSTEMS MADE OF THERMOPLASTIC MATERIALS

Technical document No. 442-05

Specifications applicable to the manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems group

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MODIFICATION HISTORY

Revision No.	Application date	Modifications
03	21/12/2018	**Update to the document layout and reference**

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Part 1
SCOPE

This Technical Document covers the manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems group.

1.1 APPLICABLE REFERENCE STANDARDS AND COMPLEMENTARY SPECIFICATIONS

1.1.1 Reference standards:

NF EN 13598-2 (March 2009)	Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticised poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 2: Specifications for manholes and inspection chambers in traffic areas and deep underground installations.
NF EN 476 (Mars 2011)	General requirements for components used in drains and sewers.

- ICs with DN ID < 600 designed to be used outside of vehicular and pedestrian areas must comply with Standard NF EN 13598-1 and are covered in TD4.

- ICs with 600 ≤ DN ID < 800 designed to be used in vehicular and pedestrian areas must comply with Standard NF EN 13598-2 and are covered in TD5. Those that meet the requirements of TD5 are considered to also meet TD4 requirements (can be used outside of vehicular and pedestrian areas).

- ICs with 600 ≤ DN ID < 800 designed to be used outside of vehicular and pedestrian areas must comply with Standard NF EN 13598-1 and are covered in TD4; they are subject to specific marking. Words: "NO TRAFFIC LOAD"
The field of use for ICs not exposed to traffic load is a depth of < 1.25 m.
ICs with branches not exposed to traffic load have no vertical loads and are therefore without dividing slabs.

- Manholes with DN ID ≥ 800 compliant with Standard NF EN 13598-2 are covered in TD5.

- Manholes covered under this reference system must be set up with a dividing slab enabling them to withstand rolling loads.

- Manholes compliant with the requirements of the NF Mark withstand the action of a water table equal to the height of the manhole.

- The maximum height of one-piece or assembled manholes is listed on the certificate; sales documents must comply with the certificate.

- In the manufacturer's technical and sales documentation, information on dividing slabs must be included that ensures users of the market availability of the dividing slab declared on the right of use certificate.

- The holder makes the information concerning the dividing slabs declared on the right of use certificate available and the holder keeps the mandated body informed if there is a change of supplier or any modification made to the characteristics of this dividing slab.

- The admissible burial depths for manholes and inspection chambers are as follows:

maximum of 5 m, with the exception of DN 800, which is limited to 3 m.

1.1.2 Complementary specifications and additional requirements

The reference specifications and test methods for the NF Mark – Thermoplastic material drain or sewer system operating without pressure are defined in the tables below. They are based on the abovementioned standards with possible additions or changes.

The holder declares the use of virgin or reclaimed/reformulated materials to the mandated body.

Manholes and inspection chambers covered under this certification reference system can be made of PVC-U, PP and PE using any of the following processes: injection moulding, low and high pressure injection moulding, forming, extrusion or rotomoulding.

A technical solution must be suggested and submitted to the secretariat of the Mark enabling the manholes and inspection chambers to support the applied loads.

TABLE 1: Characteristics of materials

Material	Characteristics	Procédés					
		Injection moulding		Rotomoulding		Extrusion	
		Initial	Final	Initial	Final	Initial	Final
PP	Density (kg/m$^{3)}$					~~≥ 900~~	
	MFR (g/10min)	≤ 20 (230°C and 2.16 kg)				≤ 2 (230°C and 2.16 kg)	
	Tensile strength (yield point) (MPa)	≥ 27	≥ 13*****				
	Modulus of elasticity (MPa)	≥ 1200	≥ 800*				
	Thermal stability (min)		≥ 8				≥ 8
PE	Tensile strength (yield point) (MPa)	≥ 16	≥ 16	≥ 13	≥13		
	Modulus of elasticity (MPa)	≥ 550	≥ 550*	≥800	≥ 550*		
	Density (kg/m$^{3)}$	≥ 925		≥925		≥925	
	MFR (g/10min)	≤ 10 (190°C, 5.00 kg)		≤ 16 (190°C, 2.16 kg)		Between 1.5 and 3.5 (190°C, 2.16 kg)	
	Thermal stability (min)		≥10		≥ 10		≥10

- *: Minimum specification: The value to take into account for admission and periodic inspections is the value defined by the holder for validation via calculation.

- **- To justify the long-term mechanical behaviour of the manhole, all loads that are applied to the operating manhole must be taken into account.**

- **- Products validated through calculation in accordance with paragraph 2.11 of TD1 do not require the durability test to be carried out, as defined in paragraph 4.1.2 and 4.2.2 of Standard NF EN 13598-2.**

Ladders and steps:

Ladders and steps must comply with Standards NF EN 14396 and NF EN 13101 respectively. Any other system is prohibited. Additionally, if there is an opening in the manhole's wall to enable the steps to be fixed, then long-lasting leaktightness must be ensured; leak testing must be carried out on the steps.

Material characteristics* of steps, with or without coating:

Aluminium alloy	**6060 or 6106 D of Standard NF EN 573-3**
Austenitic stainless steel	**Compliant with EN 10088-1 or NF EN V 10088-3 with minimum designation X6crNiMoTi17-12-2**
Glass-reinforced plastic composite	**Compliant with the NF EN 13706 (or equivalent)**

For coated steps, the thicknesses of the coatings defined in Standard NF EN 13101 paragraph 4.3.2.2 and 4.3.11 (integrity of the plastic coating) must be respected.

Material characteristics* of ladders:

Aluminium alloy	**6060 or 6106 D of Standard NF EN 573-3**
Austenitic stainless steel	**Compliant with EN 10088-1 or NF EN V 10088-3 with minimum designation X6crNiMoTi17-12-2**
Glass-reinforced plastic composite	**Compliant with NF EN 13706 (or equivalent) and UV-resistant in accordance with appendix A of Standard NF EN 14396**

*: see the below positive list.

Table 2: Colours and dimensional characteristics

Characteristics and test methods	PVC-U	PP	PE
Reference standard	NF EN 13598-2		
Colour	Grey A605 or RAL7037	Grey, orange-brown or black	Grey, orange-brown or black
Dimensions of manholes and inspection chambers	6.1 and 6.2 of NF EN 13598-2 and manholes accessible for cleaning and inspections can be accessed by personnel for maintenance work; the minimum internal diameter of the riser shaft is 985 mm. Manholes accessible for cleaning and inspection can potentially be accessed occasionally by a person equipped with a harness; the minimum internal diameter is 785 mm. The inspection chamber enables cleaning, inspection and test materials to be inserted but does not allow access to personnel, the inside diameter must be greater than or equal to the diameter of the main header or service connection. The reference system for the NF 442 Mark only allows for certification of inspection chambers with DN/ID $\geq$ 600 (tolerances from Standard NF EN 476). The slope of the benching or waste channel of manholes with DN/ID $\geq$ 800 with direct passage must be less than 10%. Tolerances for external diameters of rotomoulded spigots made to connect to smooth pipes: See Table 3 The inner diameter at the access shaft (taper) must be $\geq$ 600. The inner surfaces between the inlets and outlets of manholes and inspection chambers must be leaktight and be the uniform texture inherent to the manufacturing method as well as free of defects that may negatively impact their hydraulic performance.		
Dimensions of steps and ladders	The steps and ladders must not interfere with the flow area. See Standard NF EN 13598-2 paragraph 6.2.2.		

The dimensions and the geometric shape of a straight-through inspection chamber's cunette must meet the following requirements:

a) Minimum slope of the benching or channels inserted in the benching:

- 3% when H/D ≥ 1 [see Figure 1 a)];
- 8% when 0.5 ≤ H/D < 1 [voir Figure 1 a)];

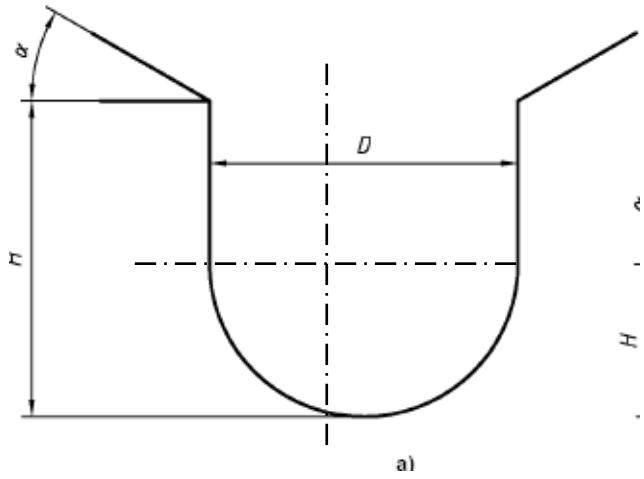


Diagram (CSTB source)

b) Invert maintenance must be respected in accordance with the requirements of Standard NF EN 476; the direction of flow (if preferential flow is unidirectional) must be established, either inside or outside the manhole.
Lumps/irregularities in the cunette must not exceed 6 mm (DN ≤ 315) and 0.02 x DN beyond that and < 30 mm (offset of invert under Standard NF EN 1433).

c) Installing blanking plugs in inspection chamber cunettes is permitted on the condition that invert continuity is preserved.

Table 3: External diameter tolerances of rotomouled manhole spigots made for connection to pipes fitted with seals according to Standards NF EN 1401-1, NF EN 13476-2, NF EN 1852-1 and NF EN 12666-1.

DN	Values		Length of the tolerance zone	
	Min	max	Min	Max
110	109.0	110.4	32	60
125	124.0	125.4	35	64
160	159.0	160.5	42	81
200	199.0	200.6	50	99
250	249.0	250.8	55	125
315	313.8	316.0	62	132
400	398.6	400.9	70	150
450	448.2	451.6	75	155
500	498.0	502.0	80	160

The length of the tolerance zone is defined according to the below diagram:

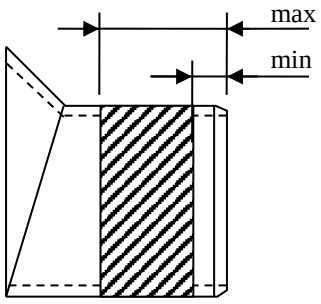


Diagram (CSTB source)

TABLE 4: Mechanical specifications for manholes and inspection chambers

Characteristics and test methods (1)	Specifications	
	Manholes	**Inspection chambers**
Reference standard	NF EN 13598-2	
Impact resistance of the base at 23°C. NF EN 13598-2 Appendix D	See Table 3 of NF EN 13598-2	
Manhole and ladder steps ** NF EN 13101*** NF EN 14396	See Table 4 of NF EN 13598-2	Not applicable
Résistance des points d'ancrage des échelles (1)	Appendix E of NF EN 14396 and DT1 chap 2.17	Not applicable
Strength of handling rings for manholes and inspection chambers (1)	No breaks	
Crushing strength of the dividing slab (1)	≥ 300 kN Any modification made to the dividing slab must be declared to the mandated body The supplier of the dividing slab must be declared to the mandated body	
Pull-off resistance of handling ring anchors for dividing slabs (under handling conditions provided by the applicant/holder) (1)	2.9*P (P: weight of the dividing slab) **2.9*P (P: weight of the component or manhole delivered assembled)** Any modification made to the dividing slab's anchoring system must be declared to the mandated body The supplier of the dividing slab must be declared to the mandated body	
Mechanical behaviour of the manhole in its field of use	The overall mechanical behaviour of the manhole or the inspection chamber must be validated by calculation	

(1) Methods specified in Technical Document 1, Part 2.

*: Addendums concerning test procedures will be provided to adjust Standard NF EN 13101 to thermoplastic products.

**: Steps and ladders in manholes must comply with NF EN 13101 and NF EN 14396 respectively, no other solution will be proposed for making manholes accessible.
Manholes may be delivered without steps or ladders. These configurations (with or without steps or ladders) will be certified and explained in detail on the certificate.
A manhole declared as not fitted with steps or ladders upon admission cannot be marketed with steps or ladders.

TABLE 5: Leaktightness and quality of seals for manholes and inspection chambers

Characteristics and test methods	Specifications
Base - connection	
Leaktightness of elastomer sealing rings NF EN 1277 Conditions D at 23°C (1) (2) (3) (4)	5% pipe deformation deviation: angular deflection specified in Standard NF EN 13598-2 Under P = 0.05 bar and 0.5 bar: No leaks Under P = -0.3 bar: Final P ≤ -0.27 bar
Base – riser shaft	
Leaktightness of the base and riser component connection NF EN 1277 Conditions A 23°C (1)	No leaks: 0.5 bar 0.05 bar -0.3 bar
Riser shaft	
Watertightness (1) Table 6 of Standard NF EN 13598-2	No leak for 15 mn 0.1H bar
Telescopic part – taper	
Watertightness (1) Table 6 of Standard NF EN 13598-2	No leaks during 15 mn - manhole, inspection chamber with taper / telescopic part filled with water
Seal	
Quality of elastomer seals (5)	NF EN 681-1 or NF EN 681-2, as the case may be

(1) Methods specified in Technical Document 1 Part 2.

(2) If manholes / inspection chambers are equipped with male and female inlets/outlets, both types of connections must be tested.

(3) The tests are carried out using SN8 (CR8) PVC pipes.

(4) Instructions regarding the conditions for setting up assemblies must be made available to installation companies and the laboratory of the Mark and specify, in particular, the position of the seal on its spigot (paper documents, Internet, etc.). If there are no available instructions for users, the test is deemed inexecutable.

(5) Ozone resistance tests: Rubber sealing elements that are protected and packaged separately until the time of their assembly must meet the same requirements, except using an ozone concentration of (25 ± 5) ppm instead of (50 ± 5) ppm.

Partie 2
MARKING CONDITIONS – REFERENCING THE NF MARK

This Technical Document specifies the conditions for marking and referencing the NF mark provided in the certification reference system of the NF mark – Gravity drainage systems.

2.1 REPRODUCING THE NF LOGO ON THE CERTIFIED PRODUCT

2.1.1 General

Refer to § 2.4.1 of the body of the reference system.

The trade reference of the certified product must be reserved for the NF mark.

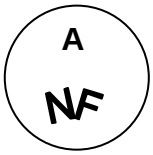
The NF logo must ensure identification of all certified products in accordance with the provisions set down in this technical document. The requirements relating to marking in the reference standards listed on page 2 of this Technical Document must also be followed.

The black and white version of the NF logo can be used.

2.1.2 Marking manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems

Holders have the option to use:

- Either the new logo followed by the letter A, as follows: A
- Or, as an exception, when using the logo creates technical and/or material difficulties, the following monogram:



The new certified products shall comply with the NF graphic charter in force.

Each component of the manhole (taper, riser shaft and base) and inspection chamber in vehicular and pedestrian areas and deeply buried systems must bear the following information, written indelibly (labels are prohibited):

① - Trademark or symbol filed by the applicant/holder with the mandated bodies,

② - NF logo and the symbol of the family: A,

③ - Identification of the material of which the main components are composed (PVC/PE/PP),

④ - The holder's identification number assigned upon notification of admission and the production site designated upon notification of admission. Marking must be placed on the product or on labels.

- *If components are manufactured at a single site, marking the identification number is optional.*
- *If 2 components provide the same function but are of different natures, the identification number of the factory is optional.*
- *If components of the same nature are manufactured at multiple sites, the identification numbers are mandatory.*

⑤ - Mark enabling the production period during the year to be identified.

- *This mark may be in digits or a code; in the latter case, the definition of this number must be provided to the mandated body.*
- *In the case of forming, a new mark, such as previously defined, must be made.*

Additional mandatory information for:

Bases:

- The nominal diameter must be marked on the product,

- The connection angles and nominal diameters of connections must be marked on the product or label.

Riser shafts:

- The nominal diameter DN/ID must be marked on the product.

Dividing slabs:

- Marking the trade name of the relevant, certified manhole and inspection chamber product(s) (marking on a label is possible).

Note: the location of the marking and the methods used are left to the applicant/holder. Any other additional marking is permitted on the condition that its location is separate from the NF marking and it causes no confusion during use.

2.2 REPRODUCTION OF THE NF LOGO ON THE PACKAGING OF THE NF-CERTIFIED PRODUCT

- The following NF logo is to be used:

or, by exception, due to technical difficulties, printing the NF logo on the packaging can be completed without the title of the application, in black and white:

The NF logo must be associated with the symbol of the application in question, so that NF mark certified products can be distinguished from other products, without any risk of confusion, being:

2.3 MARKING CERTIFIED AND ASSOCIATED CHARACTERISTICS

All documentation relating to an NF – Drain or sewer system operating without pressure certified product must use the following form:

- name and address of the applicant/holder,
- identification of the Reference System on which the certification is based **(see 2.4.2 of the body of the reference system),**
- (name and address of the delegate in France, if applicable),
- designation of the product (trademark and trade reference),
- licence or certificate number,
- certified product characteristics:
    - Dimensional characteristics (diameters, thicknesses, connections),
    - Structural integrity of the manhole or inspection chamber,
    - Impact resistance of the base,
    - Ring stiffness of the riser shaft,
    - Steps of the ladder: resistance to vertical loads and to horizontal pull-out loads,
    - Crushing strength of the dividing slab,
    - Pull-off resistance of handling ring anchors for dividing slabs,
    - Leaktightness of the assemblies of various components,
    - Tensile characteristics of the material,
    - Thermal stability,
    - Vicat,
    - Quality of elastomer sealing rings.

2.4 REPRODUCING THE NF LOGO ON DOCUMENTATION AND IN PUBLICATIONS (technical and commercial documents, labels, posters, advertising, websites, etc.)

- The following NF logo is to be used:

Part 3
APPLICANT/HOLDER QUALITY REQUIREMENTS

3.1 QUALITY CONTROL OPTION

The tests specified in these tables are to be performed with the number of specimens stipulated in the testing standards and addendums indicated in Technical Document 1 of the Certification Reference System specific to each product group, unless otherwise indicated in the tables.

a) <u>For manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems:</u>

On raw materials:

Measurements or tests (1)	**Minimum sampling frequency**	**PVC**	**PE** Rotomoulding		**PE** Injection moulding		**PP** Injection moulding	
			Initial	Final	Initial	Final	Initial	Final
Density	1 x / batch		X		X			
MFR	1 x / batch		X		X		X	
Tension (strength)	1 x / batch		X	X	X	X	X	X
Modulus of elasticity	Upon approval of each new material		X	X	X	X	X	X
Thermal stability	Upon approval of each new material			X		X		X
Resistance to internal pressure (See TD4)	Upon approval of each new material	X						
VICAT	1 x / batch	X						

Material tests (initial) may be provided by the supplier of the material by means of a certificate of analysis or conformity; the tests on the finished product (final) are carried out by the holder of the NF Mark according to the frequencies in the above table.

On finished product manholes in vehicular and pedestrian areas and deeply buried systems:

Measurements or tests (1)	**Minimum sampling frequency**	**PVC**	**PE**	**PP**
Dimensions: diameter, thickness, Appearance, colour, marking	1 every 4 hours; in the case of rotomoulded products, all parts	X	X	X
Impact resistance of the base at 23°C	1 type test	X	X	X
Manhole and ladder steps	1 type test	X	X	X
Crushing strength of the dividing slab	1 type test	X	X	X
Pull-off resistance of handling ring anchors for dividing slabs and manholes	1 type test	X	X	X

(1) Methods specified in Technical Document 1 Part 2.

On finished product inspection chambers in vehicular and pedestrian areas and deeply buried systems:

Measurements or tests [(1)]	Minimum sampling frequency	PVC	PE	PP
Dimensions: diameter, thickness, Appearance, colour, marking	1 every 4 hours; in the case of rotomoulded products, all parts	X	X	X
Impact resistance of the base at 23°C	1 type test	X	X	X
Crushing strength of the dividing slab	1 type test	X	X	X
Pull-off resistance of handling ring anchors for dividing slabs and manholes	1 type test	X	X	X
Mechanical behaviour of the inspection chamber in its field of use: Ring stiffness and structural integrity as per NF EN 13598-2	1 type test	X	X	X

(1) Methods specified in Technical Document 1 Part 2.

3.2 QUALITY MANAGEMENT OPTION

The implemented quality assurance plan must enable product compliance with the specifications of the standards and of this reference system.

Consequently, the applicant/holder must complete or ensure completion of the specified tests per the frequencies defined in the quality assurance plan, certain tests being able to be considered "type" tests (for putting new equipment in place or using a new formulation, for example).

Part 4
MONITORING ARRANGEMENTS BY CSTB

4.1 TEST PROCEDURES DURING AN APPLICATION FOR ADMISSION

a) <u>For manholes in vehicular and pedestrian areas and deeply buried systems:</u>

Mechanical specifications of manholes in vehicular and pedestrian areas and deeply buried systems

Measurement or test	Tests conducted in the factory	Tests conducted in the laboratory of the mark
DN/ID diameter Appearance Marking Colour Thicknesses Compliance with the initial dossier filed during admission or extensions Verification of the assembly instructions (4)	All shaft DNs submitted for admission: by dimensional inspection of stock on at least half the range presented and by verification of the inspection registers for the entire range	-
Sockets	All socket components submitted for admission	-
Virgin or reclaimed/reformulated material tests: Density **(PE)** Modulus of elasticity **(PP/PE)** MFR **(PP/PE)** Tension **(PP/PE)** K value **(PVC-U)** Thermal stability **(PP/PE)** **VICAT (PVC)** Resistance to internal pressure **(PVC-U)**	Specifications accompanied by the certificate of conformity (type 2.1 defined in TD1 chap. 2.20) prepared during each delivery or type 3.1 in the case of reclaimed/reformulated materials - 1 report of tests provided by the raw material supplier (this test can be carried out by the holder/manufacturer).	See paragraph 2.11 of TD1 *1 test on finished product (tension)* 1 test (thermal stability) / type of material / production site 1 test (Vicat) / type of material / production site
Structural Integrity		Validation via calculation
Impact resistance of the base at 23°C (3)	1 test	1 test
Manhole and ladder steps (5)	-	1 test
Strength of ladder anchor points	-	1 test
Crushing strength of the dividing slab	-	1 test
Pull-off resistance of handling ring anchors for dividing slabs	-	1 test The documentation, procedure and commercial offer of the holder must be verified (1) (2)
Strength of handling rings for manholes and inspection chambers	-	1 test

(1) In the manufacturer's technical and sales documentation, information on dividing slabs must be included that ensures users of the market availability of the dividing slab declared on the right of use certificate; this point will be verified during each audit.

(2) The holder makes the information concerning the dividing slabs declared on the right of use certificate available and the holder keeps the mandated body informed if there is a change of supplier or any modification made to the characteristics of this dividing slab.

(3) If a component is subcontracted, this test is completed in the laboratory of the subcontractor and not in the main unit.

(4) In the case of rotomoulded spigots, the holder must make its installation instructions available to its clients.

(5) In the case of ladders installed at the construction site, the holder must make its installation instructions available to its clients.

b) Mechanical specifications for inspection chambers in vehicular and pedestrian areas and deeply buried systems

Measurement or test	Tests conducted in the factory	Tests conducted in the laboratory of the mark
DN/ID diameter Appearance Marking Colour Thickness Conformity with the initial dossier submitted upon admission or extensions	All shaft DNs submitted for admission: by dimensional inspection of stock on at least half the range presented and by verification of the inspection registers for the entire range	-
Sockets	All socket components submitted for admission	-
Virgin or reclaimed/reformulated material tests: Density **(PE)** Modulus of elasticity **(PP/PE)** MFR **(PP/PE)** Tension **(PP/PE)** K value **(PVC-U)** Thermal stability **(PP/PE)** **VICAT (PVC)** Resistance to internal pressure **(PVC-U)**	Specifications accompanied by the certificate of conformity (type 2.1 defined in TD1 chap. 2.20) prepared during each delivery or type 3.1 in the case of reclaimed/reformulated materials - 1 report of tests provided by the raw material supplier (this test can be carried out by the holder/manufacturer).	See paragraph 2.11 of TD1 *1 test on finished product (tension)* 1 test (thermal stability) / type of material / production site 1 test (VICAT) / type of material / production site
Structural Integrity		Validation via calculation
Impact resistance of the base at 23°C	1 test	1 test
Crushing strength of the dividing slab	-	1 test
Pull-off resistance of handling ring anchors for dividing slabs	-	1 test

c) <u>Suitability for use characteristics of manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems (applies to products in Tables a and b)</u>

Measurement or test	Tests conducted in the factory	Tests conducted in the laboratory of the mark
Base		
Leaktightness of seal rings (1) NF EN 1277 Conditions B and C at 23°C	-	1 test per shaft DN per connection system
Watertightness of the base and riser component connection (1) (3)	-	1 test per shaft DN per seal ring model and per riser shaft model (2)
Riser component		
Watertightness between components and associated constituent parts (1) (3)	-	1 test per shaft DN per seal ring model (2)
Telescopic part more than 0.5 m below ground		
Watertightness (1) (3)	-	1 test per shaft DN per seal ring model (2)
Taper		
Watertightness (1) (3)	-	1 test per shaft DN per seal ring model (2)
Top component		
Quality of elastomer seals (3) (3)	-	1 report of tests provided by the manufacturer of elastomer sealing rings. If there is no test report from the manufacturer/supplier, a test will be conducted in the laboratory of the mark.

(1) When watertightness tests of riser seals can be combined with those of seal rings, the tests are carried out simultaneously. However, if there is a non-conformity, the tests are conducted a second time, but separately.

(2) If the seals are made of elastomer identical in quality to that used for the NF-certified pipes, this test is not conducted.

(3) Leak tests between the: base / riser shaft / telescopic part / taper / top component are carried out simultaneously. However, if there is a non-conformity, the tests are conducted a second time, but separately.

4.2 TEST PROCEDURES DURING MONITORING OF CERTIFIED PRODUCTS

a) <u>For manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems:</u>

During the audit, all shaft DNs must be in stock

Mechanical specifications for manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems

Measurement or test	Tests conducted in the factory		Tests conducted in the laboratory of the mark
	Quality control	Quality management	
Mean external diameter	1 type per shaft DN per visit		-
Appearance Marking Colour Length Any diameter Thickness Sockets (depth of groove)			-
Virgin or reclaimed/reformulated material tests: Density **(PE)** Modulus of elasticity **(PP/PE)** MFR **(PP/PE)** Tension **(PP/PE)**	Specifications accompanied by the certificate of conformity (type 2.1 defined in TD1 chap. 2.20) prepared during each delivery or type 3.1 in the case of reclaimed/reformulated materials		- 1 test (Traction finished product)
Thermal stability **(PP/PE)** **VICAT (PVC)**	- -		1 test / type of material / production site 1 test / type of material / production site
Impact resistance of the base at 23°C (5)	1 type at each visit (choice of category)	1 type per year (choice of category)	-
Manhole and ladder steps	-	-	1 test every 3 years performed when taking samples for leak testing (manholes only)
Strength of ladder anchor points	-	-	1 test every 3 years performed when taking samples for leak testing (manholes only)
Dividing slab	-	-	The documentation, procedure and commercial offer of the holder must be verified (3) (4)

Suitability for use characteristics of manholes and inspection chambers in vehicular and pedestrian areas and deeply buried systems

Measurement or test (2)	Tests conducted in the factory		Tests conducted in the laboratory
	Quality control	Quality management	
Base			
Leaktightness of seal rings (1) NF EN 1277 Conditions B and C at 23°C	-		1 test every 3 years and at least every shaft DN tested every 3 years
Watertightness of the base and riser component connection (1)	-		1 test every 3 years and at least every shaft DN tested every 3 years
Riser component			
Watertightness between components and associated constituent parts (1)	-		1 test every 3 years and at least every shaft DN tested every 3 years
Telescopic part more than 0.5m below ground			
Watertightness (1)	-		1 test every 3 years and at least every shaft DN tested every 3 years
Taper			
Watertightness (1)	-		1 test every 3 years and at least every shaft DN tested every 3 years
Technical and commercial documents and website (body of reference system, chap. 2.5.3.3)	All information and specifications mentioned on the certificate must be consistent with the technical and commercial documents and website of the holder.		

(1) When watertightness tests of riser seals can be combined with those of seal rings, the tests are carried out simultaneously. However, if there is a non-conformity, the tests are conducted a second time, but separately.

(2) Methods specified in Technical Document 1 Part 2.

(3) In the manufacturer's technical and sales documentation, information on dividing slabs must be included that ensures users of the market availability of the dividing slab declared on the right of use certificate; this point will be verified during each audit.

(4) The holder makes the information concerning the dividing slabs declared on the right of use certificate available and the holder keeps the mandated body informed if there is a change of supplier or any modification made to the characteristics of this dividing slab.

(5) If a component is subcontracted, this test is completed in the laboratory of the subcontractor and not in the main unit.