


Technical Specification

PROTECTIVE SLEEVES FOR STEEL AND POLYETHYLENE NETWORKS

ET 305


Revision No. 4 | 6 February 2023



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Register of revisions

Revision number	Date	Motif
0	2007-05-29	Initial wording.
1	2013-11-12	General review.
2	2017-12-18	General review.
3	2018-09-03	General review.
4	2023-02-06	General revision carried out by IDOM Consulting, Engineering, Architecture, SAU

Information classification


Confidential	<input type="checkbox"/>	Restricted	<input type="checkbox"/>	Internal use	<input type="checkbox"/>	Public	<input checked="" type="checkbox"/>
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Distribution of the document

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Internal	CA <input type="checkbox"/> AT <input checked="" type="checkbox"/> ACR <input checked="" type="checkbox"/>
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	ACR-DC <input type="checkbox"/> ACR-GC <input type="checkbox"/> ACR-RD <input type="checkbox"/>
Nominal	< name, function, position >

Caption:	
CA: Board of Directors	ACR: Clients and Networks Area
AT: Technical Area	ACR-DC: Clients and Networks Area - Commercial Development
AT-ED: Technical Area - Engineering and Development	ACR-GC: Clients and Networks Area - Large Consumption
AT-EX: Technical Area - Exploration	ACR-RD: Clients and Networks Area - Networks
AT-GE: Technical Area - Energy Management	
AT-MS: Technical Area - Maintenance and Systems	

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The approval of this document formalised in this page, prevails over the totality of its contents.		

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Preamble

As part of the "H2 REN Programme" aimed at adapting technical specifications to prepare assets to receive hydrogen up to 100%, REN Portgás Distribuição (Portgás) has identified this regulation to be subject to assessment and consequent revision.

This revision of ET 305 cancels and replaces the previous version dated 03 September 2018, and it is advisable to read this technical specification in full for a correct application of its provisions.

This technical specification should be given the status of a Portgás standard which establishes the rules to be followed to achieve the discriminated objective.

1. Objective

This material technical specification establishes the requirements, standards and technical conditions to be met by sleeves for on-site installation, intended to provide additional mechanical protection for steel or polyethylene pipes, resulting from the crossing of obstacles, special crossings, branches, entries into primary network valve manholes, or from compliance with standards relating to the installation of gas networks in the vicinity of other infrastructures.

2. Scope

This technical specification applies to protection sleeves to be used in the underground infrastructure of Portgás, resulting from the construction of 2nd Stage Pipelines: Primary Network (maximum pressure rating of 20 bar) and Distribution Networks: Secondary Network (maximum pressure rating of 4 bar), for operating temperatures between -5°C and 50°C.

3. References

All undated documents should be considered in their latest version.


3.1. External references

Despacho n° 806-B/2022, de 19 de janeiro

"Regulamento da Rede Nacional de Distribuição de Gás."

NP EN 1555 - 2

"Plastic piping systems for gaseous fuel supply. Polyethylene (PE). Part 2: Pipes."

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NP EN 13476 - 1

"Plastics piping systems, buried, non-pressure, for drainage and sewerage. Unplasticized polyvinyl chloride (PVC-U), polypropylene (PP) and polyethylene (PE) structured wall piping systems - Part 1: General requirements and performance characteristics."

NP EN 13476 - 3 + A1

"Plastics piping systems, buried, non-pressure, for drainage and sewerage. Unplasticized polyvinyl chloride (PVC-U), polypropylene (PP) and polyethylene (PE) structured wall piping systems - Part 3: Specifications for pipes and fittings with smooth internal surface and profiled external surface and the system, Type B."

CEN/TS 13476 - 4

"Plastics piping systems for non-pressure underground drainage and sewerage - Structured-wall piping systems of unplasticized poly (vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 4: Guidance for the assessment of conformity".

NP EN 1452 - 1

"Plastics piping systems for water supply, drainage and sewerage, buried and overhead, with pressure. Unplasticized polyvinyl chloride (PVC-U) - Part 1: General."

NP EN 1452 - 2

"Plastics piping systems for water supply, drainage and sewerage, buried and overhead, with pressure. Unplasticized polyvinyl chloride (PVC-U) - Part 2: Pipes."

3.2. Internal references

ET 114

Warning band

ET 308

Spacer collar


ET 560

Final Construction Report

4. Definitions / Acronyms

Contractor

This is an entity accredited by the Directorate General of Energy and Geology (DGEG), with staff organisation, competence and suitability to ensure, in accordance with established criteria and under a service provision regime for Portgás, the execution of the works object of this technical specification.

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Inspection

Supervision activity that aims to ensure compliance of work carried out by third parties (Contractors) for Portgás, respecting and enforcing what is contractually established and ensuring compliance with all legally applicable standards, from local, national or community sources, as well as Portgás' technical specifications and procedures.

This activity may be carried out by an entity outside Portgás (Inspection Entity) or by a duly qualified Portgás technician.

5. Types of protective sleeves

- a) Portgás accepts the use of the following types of protection sleeves:
 - Polyvinyl chloride (PVC) pipe,
 - Corrugated pipe made of polypropylene (PP) or high-density polyethylene (HDPE),
 - High density polyethylene (HDPE) pipe,
 - Low density polyethylene pipe (LDPE).
- b) Portgás or the Inspectorate may determine the use of another type of protection sleeve, when deemed necessary (e.g.: steel tube, sandstone and fibreglass).
- c) Any other type of protection sleeve, which is not enshrined in this technical specification and whose use is proposed by the Contractor, may only be used with the express approval of Portgás.

6. Characteristics of the tubes to be used as protection sleeves

6.1. General

The tubes to be used as protection sleeves must have the following generic characteristics:


- a) They must be manufactured in accordance with the standards applicable to each of the permitted types of tube.
- b) Be not putrescible.
- c) To be insulating and insensitive to scattered ground and telluric currents.

6.2. Specific requirements

6.2.1. Standard pipe (plain)

6.2.1.1 Polyvinyl chloride (PVC)

- a) The rigid PVC pipe must be of the non-plasticised type (PVC-U) and must comply with the EN 1452 standard.

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- b) The PVC pipe to be used as a protection sleeve must guarantee a minimum service pressure of 4 kg/cm² (PN 4).
- c) Portgás may determine the use of PVC pipes designed to guarantee a service pressure of more than 4 kg/cm².
- d) The PVC pipe should be grey in colour.

6.2.1.2. Polyethylene

- a) Portgás only admits the use of high-density polyethylene pipe (HDPE) as a negative, in crossings through directed mechanical drilling (special points).
- b) The HDPE pipe to be used as a protection sleeve must be made of PE 100 resin and have a minimum operating pressure of 4 kg/cm² (PN 4).
- c) The HDPE pipe should be black with a yellow band and should comply with standard NP EN 1555-2.
- d) In the case of branch lines, exceptionally, low density polyethylene (LDPE) or high-density polyethylene (HDPE) pipes may be used as protection sleeves. In both cases, they should be black, free of any filaments and have a minimum pressure class of 4 kg/cm² (PN 4).
- e) Standard PP pipe, i.e. not corrugated, is not accepted.

6.2.2. Corrugated pipe:

6.2.2.1. polypropylene (PP) or polyethylene (PE)

- a) Portgás does not accept the use of corrugated pipes commonly used in "non-pressure drainage and sewerage systems", which must comply with standard NP EN 13476.
- b) The pipe must have a double wall: corrugated on the outside and smooth on the inside.
- c) The corrugated tube to be used as a protection sleeve must have a minimum circumferential stiffness class of 6 kN/m² (SN 6).
- d) Portgás or the Inspection Body may decide to use corrugated pipes with a circumferential stiffness class higher than 6 kN/m², when deemed necessary.
- e) The outer wall of the corrugated pipe should be black in colour.


7. Requirements of project

- a) Table 1 identifies the relationship between the nominal diameter of the gas infrastructure and the characteristic of the protective sleeve to be used: minimum nominal diameter and type.
- b) When the installation of the gas piping inside the protective sleeves is carried out with the application of spacer collars, the nominal diameter of the protective sleeve, explained in table 1 below, is the one suitable for the diameter of the spacer collars provided for in ET 308.

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Gas infrastructure		Protective Sleeve Type						
		Standard pipe (plain)					Corrugated Pipe	
DN Steel (mm)	DN PE (mm)	Ø PVC Pipe		Ø LDPE Pipe		Ø HDPE Pipe	Ø Corrugated Tube	
		Without spacer	With spacer	Without spacer	With spacer	Without spacer	Without spacer	With spacer
---	20	50	---	50	---	50	50	---
---	32	50	---	50	---	50	50	---
---	40	75	---	---	---	75	75	---
---	63	90	---	---	---	---	110	---
---	110	140	200	---	200	200	160	200
---	160	200	250	---	250	250	200	250
---	200	250	315	---	315	315	250	315
100	---	160	200	---	---	---	160	200
150	---	250	250	---	---	---	250	250
200	---	315	315	---	---	---	315	315
250	---	315	400	---	---	---	315	400
300	---	400	400	---	---	---	400	400

Table 1

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8. Installation requirements


- a) The protective sleeves should be marked with a warning strip (ET 114) wrapped around their entire surface with a 50% overlap, and along their entire length. This "special" signalling does not dispense with the signalling normally used to mark the gas infrastructure. This obligation will not apply in the case of crossings by directed mechanical drilling (special points).
- b) The protection sleeves shall be installed free from any longitudinal cuts.
- c) The ends of the protective sleeves must be free of burrs that could cause damage to the gas pipeline.
- d) Portgás or the Inspectorate may determine that in parallel routes, or at the junction with other infrastructures, the protection sleeves should be reinforced by concreting, or by the application of concrete slabs.

9. Packaging

- a) During handling and transport operations, the pipes must be protected from direct UV rays.
- b) When not in use, the pipes should be stored in a dry place away from direct sunlight, avoiding prolonged storage at temperatures above 35°C.
- c) It is not permitted in storage:
 - Place tubes in contact with solvents,
 - Stack loose pipes higher than 1 metre.
- d) During storage, handling and transport, pipes should be secured so that they do not meet surfaces containing stones or sharp edges.

10. Marking

- a) The pipes must be marked individually, legibly and visibly with the following elements:
 - Trade name;
 - Manufacturer's identification;
 - Abbreviation identifying the constituent material;
 - Nominal outer diameter;
 - Nominal stiffness class / Nominal working pressure;
 - Date of manufacture;
 - Reference to the manufacturing standard / type approval document.
- b) There must be a correlation between the marking of the pipes, the manufacturing certificates and other documents relating to the supply of the pipes.

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11. Manufacturing Certificates

The pipes must be accompanied by the corresponding manufacturing certificates or, in their absence, a declaration of conformity, issued by the manufacturer, and these must be mentioned in the final site report in accordance with ET 560.