
**Plastics piping systems for the supply
of gaseous fuels for maximum
operating pressures up to and including
2 MPa (20 bar) — Polyamide (PA) —**

**Part 5:
Fitness for purpose of the system**

*Systèmes de canalisations en matières plastiques pour la distribution
de combustibles gazeux pour des pressions maximales de service
inférieures ou égales à 2 MPa (20 bar) — Polyamide (PA) —*

Partie 5: Aptitude à l'emploi du système



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Contents

Page

Foreword	iv
Introduction.....	v
1 Scope.....	1
2 Normative references	1
3 Terms, definitions, symbols and abbreviated terms	2
3.1 Terms and definitions — General.....	2
3.2 Terms and definitions for preparation of test assemblies by electrofusion	3
3.3 Symbols.....	3
4 Fitness for purpose.....	5
4.1 Method of preparation of assemblies for testing	5
4.2 Requirements for fitness for purpose	6
5 Overall service (design) coefficient.....	9
Annex A (normative) Preparation of test assemblies by butt fusion	10
Annex B (normative) Preparation of test assemblies by electrofusion	13
Annex C (normative) Test methods for the assessment of fitness for purpose of transition fittings	19
Annex D (normative) Derating coefficients for operating temperatures.....	21

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 22621-5 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 4, *Plastics pipes and fittings for the supply of gaseous fuels*.

ISO 22621 consists of the following parts, under the general title *Plastics piping systems for the supply of gaseous fuels for maximum operating pressures up to and including 2 MPa (20 bar) — Polyamide (PA)*:

- *Part 1: General*
- *Part 2: Pipes*
- *Part 3: Fittings*
- *Part 5: Fitness for purpose of the system*
- *Part 6: Code of practice for design, handling and installation*

Introduction

As polyamide material is used for piping systems for the supply of gaseous fuels both at low and high pressure, ISO/TC 138/SC 4 experts decided to split the standardization programme into two series of International Standards, with one series [ISO 15439 (all parts)] covering low pressures up to 0,4 MPa (4 bar), and the other (ISO 22621) high pressures up to 2 MPa (20 bar).

Thin wall thickness pipes and solvent cement joints are used typically for pressures up to 0,4 MPa (4 bar), while thicker wall thickness pipes and butt fusion, electrofusion and mechanical joints are typically used for pressures up to 2 MPa (20 bar). For technical and safety reasons, it is not possible to mix the components of the two types of piping system (thin wall thickness pipes cannot be jointed by butt fusion or mechanical joints and vice versa). In particular, solvent cement joints must not be used for jointing for high-pressure piping systems.

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Plastics piping systems for the supply of gaseous fuels for maximum operating pressures up to and including 2 MPa (20 bar) — Polyamide (PA) —

Part 5: Fitness for purpose of the system

1 Scope

This part of ISO 22621 specifies the requirements of fitness for purpose of the polyamide (PA) piping system, intended to be buried and used for the supply of gaseous fuels at maximum operating pressures (MOP) up to and including 2 MPa (20 bar¹).

It specifies the definitions of electrofusion and butt fusion joints.

It also specifies the method of preparation of test piece joints and the tests to be carried out on these joints for assessing the fitness for purpose of the system under normal and extreme conditions.

In addition, it specifies the test parameters for the test methods to which it refers.

In conjunction with the other parts of ISO 22621, it is applicable to PA fittings, their joints and joints with components of PA.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method*

ISO 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies*

ISO 6259-1, *Thermoplastics pipes — Determination of tensile properties — Part 1: General test method*

ISO 13953, *Polyethylene (PE) pipes and fittings — Determination of the tensile strength and failure mode of test pieces from a butt-fused joint*

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 MPa = 1 N/mm².

ISO 13954, *Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm*

ISO 13955, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies*

ISO 22621-1, *Plastics piping systems for the supply of gaseous fuels for maximum operating pressures up to and including 2 MPa (20 bar) — Polyamide (PA) — Part 1: General*

ISO 22621-2, *Plastics piping systems for the supply of gaseous fuels for maximum operating pressures up to and including 2 MPa (20 bar) — Polyamide (PA) — Part 2: Pipes*

ISO 22621-3, *Plastics piping systems for the supply of gaseous fuels for maximum operating pressures up to and including 2 MPa (20 bar) — Polyamide (PA) — Part 3: Fittings*

3 Terms, definitions, symbols and abbreviated terms

For the purposes of this document, the terms, definitions, symbols and abbreviated terms given in ISO 22621-1 and the following apply.

3.1 Terms and definitions — General

3.1.1

electrofusion joint

joint between a PA electrofusion socket or saddle fitting and a pipe or a spigot end fitting

NOTE The electrofusion fittings are heated by the Joule effect of the heating element incorporated at their jointing surfaces, causing the material adjacent to them to melt and the pipe and fitting surfaces to fuse.

3.1.2

butt fusion joint (using heated tool)

joint made by heating the planed ends the surfaces of which match by holding them against a flat heating plate until the PA material reaches fusion temperature, removing the heating plate quickly and pushing the two softened ends against one another

3.1.3

fusion compatibility

ability of two similar or dissimilar polyamide materials to be fused together to form a joint which conforms to the performance requirements of this standard

3.1.4

transition fitting

fitting that makes a transition joint between a polyamide (PA) piping and a metallic pipe

3.1.5

transition joint

joint at which two different piping materials (the PA and metal piping) are connected

3.1.6

anodeless riser

type of transition fitting which is designed to transport gas from an underground polyamide (PA) service line to above-ground steel piping

NOTE In an anodeless riser, the PA pipe is always the gas carrier, at least, in the below ground section.