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de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 751-3:2022+A1:2023

Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes and PTFE

Matériaux d'étanchéité pour raccords
filetés en contact des gaz de la 1ère,
2ème et 3ème famille et de l'eau chaude -
Partie 3 : Bandes et cordons en PTFE non

Dichtmittel für metallene
Gewindeverbindungen in Kontakt mit
Gasen der 1., 2. und 3. Familie und
Heißwasser - Teil 3: Ungesinterte PTFE-

12/2023



National Foreword

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ILNAS-EN 751-3:2022+A1:2023

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English Version

**Sealing materials for metallic threaded joints in contact
with 1st, 2nd and 3rd family gases and hot water - Part 3:
Unsintered PTFE tapes and PTFE strings**

Matériaux d'étanchéité pour raccords filetés en contact
des gaz de la 1ère, 2ème et 3ème famille et de l'eau
chaude - Partie 3 : Bandes et cordons en PTFE non
fritté

Dichtmittel für metallene Gewindeverbindungen in
Kontakt mit Gasen der 1., 2. und 3. Familie und
Heißwasser - Teil 3: Ungesinterte PTFE-Bänder und -
Fäden

This European Standard was approved by CEN on 27 April 2022 and includes Amendment approved by CEN on 11 October 2023.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 751-3:2022+A1:2023) has been prepared by Technical Committee CEN/TC 208 “Elastomeric seals for joints in pipework and pipelines”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2024, and conflicting national standards shall be withdrawn at the latest by June 2024.

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

This document supersedes A1 EN 751-3:2022 A1.

This document includes Amendment 1, approved by CEN on 2023-10-11.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

A1 *deleted paragraphs* A1

The EN 751 series comprises the listed parts:

- Part 1: Anaerobic jointing compounds;
- Part 2: Non-hardening jointing compounds;
- Part 3: Unsintered PTFE tapes and strings.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document specifies requirements and test methods for tapes and strings produced from virgin unsintered polytetrafluorethylene (PTFE) for use with metallic threaded joints. It specifies two classes of PTFE tapes and PTFE strings – mainly differing in thickness and mass per area – for fine (F) and coarse (G) threads.

A universally applicable PTFE tape or PTFE string may be used for all gas, potable water and hot water installation.

In respect of potential adverse effects of the jointing compounds covered by this document on the quality of water intended for human consumption this document provides no information as to whether the jointing compounds may be used without restriction in any of the Member States of the EU or EFTA. The use and characteristics of the jointing compounds should comply with current regulations, where they exist, depending the acceptance of verifiable European criteria.

Compared to previous standard EN 751-3:1996, this document does not include an assessment of the turning back properties. It has been determined in practice and during periodic tests that these properties can only be reproduced to a limited extent. Turning back during installation should be avoided. Should a connection made with PTFE tapes or threads nevertheless (have to) be turned back during installation, this is the responsibility of the user. It is common sense that installations are checked for tightness after completion.

Although PTFE natural colour is white and most common for PTFE tapes and PTFE strings, other colours may be used as well.

Test practice since the standard was published has shown that the vibration test has not provided any additional information about the tightness of the threaded connections. Therefore, the test was removed from the test schedule of the standard.

1 Scope

This document specifies requirements and test methods for unsintered polytetrafluorethylene (PTFE) tapes and polytetrafluorethylene (PTFE) strings (PTFE tapes or PTFE strings, for short) which are suitable for sealing threaded metallic joints as specified in EN 10226-1:2004.

This document covers two classes of PTFE tapes and PTFE strings suitable for fine (F) and coarse (G) threads.

The PTFE tapes and PTFE strings are used as sealing materials for metallic threaded joints in contact with 1st family gases (town gas), 2nd family gases (natural gas) and 3rd family gases (liquefied petroleum gases (LPG)) up to 500 kPa, up to 700 kPa for hot water of heating systems, and up to 20 kPa in gas appliances and their auxiliary equipment. The maximum working pressure covered in this document is 2000 kPa which is relevant to LPG storage. The temperature range is limited to -20 °C to 125 °C.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 10242:1994,¹ *Threaded pipe fittings in malleable cast iron*

EN 10255:2004+A1:2007, *Non-alloy steel tubes suitable for welding and threading — Technical delivery conditions*

EN 12164:2016, *Copper and copper alloys — Rod for free machining purposes*

EN 10226-1:2004, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

EN 10226-3:2005, *Pipes threads where pressure tight joints are made on the threads — Part 3: Verification by means of limit gauges*

EN ISO 11357-3:2018, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization (ISO 11357-3:2018)*

EN ISO 11358-1:2014, *Plastics — Thermogravimetry (TG) of polymers — Part 1: General principles (ISO 11358-1:2014)*

¹ This document is currently impacted by the stand-alone amendments EN 10242:1994/A1:1999 and EN 10242:1994/A2:2003.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

PTFE tape

thread sealing tape manufactured from virgin unsintered polytetrafluorethylene (PTFE) without fillers or additives

3.2

PTFE string

thread sealing string manufactured from virgin unsintered polytetrafluorethylene (PTFE) without fillers or additives

Note 1 to entry: PTFE strings are also known as “PTFE cords”.

3.3

gas family

group of gaseous fuels with similar burning behaviour linked together by a range of Wobbe indices

Note 1 to entry: For further information on types of gases see EN 437:2021.

3.4

batch

any quantity of PTFE-tapes or PTFE strings manufactured in a single mix at one time

4 Differentiation and classification of PTFE tapes and PTFE strings

4.1 Differentiation

Tapes and strings differ in their geometry, weight per unit area and application. Both have a rectangular geometry, whereby the tapes are thin and wide, while the strings are thick and narrow. Therefore, tapes have to be wrapped overlapping, while strings are wrapped crosswise with a larger number of windings. In addition, the strings have a greater weight per unit area.

NOTE 1 Typical tape dimensions; 12 mm × 0,10 mm.

NOTE 2 String dimensions; e.g. 2 mm × 0,5 mm, other cross sections are possible.

4.2 Classification

There are two classes of PTFE tapes and PTFE strings suitable only for fine (F) and for fine and coarse (G) threads in accordance with Table 1.