



SLOVENSKI STANDARD
SIST EN 12613:2009

01-oktober-2009

BUXca Yý U
SIST EN 12613:2002

Dc`ja YfbY`cdcncf]bY`df]dfUj Y`nUdcXnYa bY`_UV`Y]b`Wj cj cXY`n`j]Xb]a]
nbU]bcgla]

Plastics warning devices for underground cables and pipelines with visual characteristics

Warneinrichtungen aus Kunststoff mit visuellen Eigenschaften für erdverlegte Kabel und Rohrleitungen

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Dispositifs avertisseurs à caractéristiques visuelles, en matière plastique, pour câbles et canalisations enterrés

[SIST EN 12613:2009](#)

<https://standards.iteh.ai/catalog/standards/sist/53bee416-3b5b-4fa6-be41-d1e735009707/sist-en-12613-2009>

Ta slovenski standard je istoveten z: EN 12613:2009

ICS:

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
83.140.99	Drugi izdelki iz gume in polimernih materialov	Other rubber and plastics products

SIST EN 12613:2009

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12613:2009

<https://standards.iteh.ai/catalog/standards/sist/53bee416-3b5b-4fa6-be41-d1e735009707/sist-en-12613-2009>

EUROPEAN STANDARD

EN 12613

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2009

ICS 13.320; 83.140.99

Supersedes EN 12613:2009

English Version

Plastics warning devices for underground cables and pipelines with visual characteristics

Dispositifs avertisseurs à caractéristiques visuelles, en
matière plastique, pour câbles et canalisations enterrés

Warneinrichtungen aus Kunststoff mit visuellen
Eigenschaften für erdverlegte Kabel und Rohrleitungen

This European Standard was approved by CEN on 20 May 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

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

iTeh STANDARD PREVIEW
(standardsite.com)
<https://standards.iteh.ai/catalog/standards/sist/53bee416-3b5b-4fa6-be41-d1e735009707/sist-en-12613-2009>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Material	6
5 Requirements	6
5.1 Colour	6
5.2 Appearance and colour fastness	6
5.3 Dimensional characteristics	6
5.4 Laying characteristics	7
5.4.1 General.....	7
5.4.2 Tensile withstand strength	7
5.4.3 Transversal rigidity.....	7
5.4.4 Flatness	7
5.5 Visual warning characteristics	7
5.6 Resistance against micro-organisms	7
5.7 Resistance to UV-light.....	7
5.8 Temperature stability	8
5.9 Resistance of printing	8
5.10 Marking	8
6 Test methods.....	8
6.1 Test pieces and test conditions	8
6.2 Colour fastness.....	8
6.3 Tensile withstand strength	8
6.3.1 Test pieces	8
6.3.2 Apparatus	9
6.3.3 Procedure	9
6.4 Transversal rigidity.....	9
6.5 Flatness	10
7 Factory production control tests	10
8 Test report	11
Annex A (normative) Determination of visual warning characteristics by simulation of trench opening	12
A.1 Principle.....	12
A.2 Apparatus	12
A.3 Test pieces	16
A.4 Conditioning and test temperature	16
A.5 Procedure	16
A.6 Test conditions for warning devices wider than 500 mm.....	16
Annex B (normative) Chemical resistance to ammonium sulphide	17
B.1 Apparatus	17
B.2 Preparation of test pieces	17
B.3 Procedure	17

Foreword

This document (EN 12613:2009) has been prepared by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by NBN.

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 December 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

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

This document supersedes EN 12613:2001.

This document is a revision of EN 12613:2001 with the following modifications:

- review of the test method for assessing the visual characteristics of the warning devices (Annex A) while keeping the principle and the functional features specified in EN 12613:2001;
- addition of test conditions for assessing the visual characteristics of the warning devices wider than 500 mm;
- updating of the normative references;
- improvement of the subclauses for the laying characteristics;
- improvement of the subclauses for the resistance against micro-organisms, to UV-light and temperature stability.

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

Introduction

Visual warning devices are used for the manual or mechanized laying of cables and piping buried in ground such as electrical power cables, communication cables, pressure and non-pressure piping systems.

The purpose of warning devices is to warn of the presence of a pipe or a cable, when opening a trench, to indicate its orientation and to identify the equipment protected.

The warning devices are expected to last at least the lifetime of the equipments with which they are associated.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 12613:2009](https://standards.iteh.ai/catalog/standards/sist/53bee416-3b5b-4fa6-be41-d1e735009707/sist-en-12613-2009)

<https://standards.iteh.ai/catalog/standards/sist/53bee416-3b5b-4fa6-be41-d1e735009707/sist-en-12613-2009>

1 Scope

This European Standard specifies the material, mechanical and functional (fitness for purpose) requirements for warning devices with visual characteristics manufactured from plastics, intended to indicate the presence of cables and piping systems buried in ground when opening trenches and more generally during digging work.

This European Standard also specifies the test methods referred to in this document.

This European Standard is applicable to two types of visual warning devices: tapes (type 1) and meshes (type 2).

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.

EN 60898-1:2003, *Electrical accessories — Circuit breakers for overcurrent protection for household and similar installations — Part 1: Circuit-breakers for a.c. operation (IEC 60898-1:2002, modified)*

EN ISO 175, *Plastics — Method of test for determination of the effects of immersion in liquid chemicals (ISO 175:1999)*

EN ISO 846, *Plastics — Evaluation of the action of microorganisms (ISO 846:1997)*

EN ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance (ISO 4892-1:1999)*

3 Terms and definitions

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

3.1

type 1 warning device

strip manufactured from plastics to warn of the presence of underground cables or pipes during excavation

3.2

type 2 warning device

mesh/net manufactured from plastics to warn of the presence of underground cables or pipes during excavation

3.3

nominal width of a warning device (W_0)

overall width of the warning device, as declared by the manufacturer, in millimetres

3.4

longitudinal direction

direction corresponding to the extrusion direction, parallel to the length of the reel

3.5

transversal direction

direction parallel to the width (at right angle to the length)

EN 12613:2009 (E)

4 Material

The material shall be made of any thermoplastic material, e.g. polyethylene (PE) or polypropylene (PP), to which are added those additives necessary for the manufacture of warning devices conforming to the requirements of this standard.

The use of own or external reprocessible materials or recyclable materials shall be permitted for the manufacture of warning devices conforming to the requirements of this standard.

The material, additives, colour masterbatches and inks for printing, if added, shall have no detrimental effect on the environment.

5 Requirements

5.1 Colour

The colour of the warning device shall be as agreed between the manufacturer and the purchaser.

5.2 Appearance and colour fastness

The appearance, colouring and marking of the warning device shall not exhibit any change when tested in accordance with 6.2. No discoloration or change of the initial colour shall be permitted. Only a change in surface appearance (e.g. gloss/matt) shall be permitted.

For a given type of warning device (design, width), the colour fastness shall be tested for each colour.

5.3 Dimensional characteristics

The nominal width, W_0 , of the warning device shall be as agreed between the manufacturer and the purchaser.

For type 1 warning devices, each individual value of the width shall be equal or greater than 50 mm and the outside edges of the warning device shall be straight and parallel. The deviation of each outside edge, towards outside or inside relatively to the mean line, shall be less or equal to 2 mm.

For type 2 warning devices, the dimensional characteristics shall conform to Table 1 and it is recommended that the minimum reel length is equal or greater than 100 m or as agreed between the manufacturer and the purchaser.

Table 1 — Dimensional characteristics

Characteristics	Unit	Requirements	
Width (W)	mm	$(W_0 - 0,1W_0 \leq W \leq W_0 + 0,1W_0)$ and $W \geq 50$ $(W_0 - 10 \leq W \leq W_0 + 10)$	$W_0 \leq 100$ $W_0 > 100$
Internal perimeter of an opening	mm	≤ 360	
Strand width	mm	≥ 1 for an internal perimeter < 160 ≥ 2 for an Internal perimeter ≥ 160	

5.4 Laying characteristics

5.4.1 General

For ease of use, the warning devices need sufficient rigidity, flatness and longitudinal mechanical strength to maintain their shape.

5.4.2 Tensile withstand strength

When tested in accordance with 6.3, the type 1 warning device shall withstand a load of 200 N during 5 min in the longitudinal direction, without starting of the separation of the weak points, if any, and shall not exhibit a reduction of more than 20 % of its width after removal of the load.

When tested in accordance with 6.3, the type 2 warning device shall withstand a load of 300 N during 5 min in longitudinal direction, without starting of the separation of the weak points, if any, and shall not exhibit a reduction of more than 20 % of its width after removal of the load.

5.4.3 Transversal rigidity

When tested in accordance with 6.4, the deflection of outside edges of the warning device shall be less or equal to $W_0/4$.

If the nominal width of the warning device is greater than 500 mm, this requirement shall not apply.

5.4.4 Flatness

When tested in accordance with 6.5, the warning device shall not exhibit at any point a separation with respect to the reference surface greater than $W_0/4$.

5.5 Visual warning characteristics

The visual characteristics of the warning devices are assessed by means of a test which simulates the opening of a trench with the bucket of an excavator. See A.1.

When tested in accordance with Annex A, the warning device shall exhibit at least one single part of a minimum length of 200 mm outside of the movable plate (which simulates the bucket) and at least one single part of a minimum length of 200 mm in the frame (which simulate the trench). The width of the visible parts of warning device shall be greater or equal to 2 mm.

5.6 Resistance against micro-organisms

The resistance against micro-organisms shall be determined only for the warning devices made from materials other than polyethylene (PE) or polypropylene (PP).

When tested in accordance with EN ISO 846 and the test conditions as specified by the purchaser, the warning device shall not exhibit any change.

5.7 Resistance to UV-light

If required, the warning device shall be resistant to UV-light. When tested in accordance with the guidance provided by EN ISO 4892-1 and its subsequent parts, and the test method and conditions as specified by the purchaser, the warning device shall conform to the requirement as specified by the purchaser.

If the warning device is not resistant to UV-light, it shall be protected by suitable packaging, as agreed between manufacturer and purchaser.