

LEKKE AVASTAMISE SÜSTEEMID. OSA 7: NÕUDED JA
KATSE-/HINDAMISMEETODID VAHERUUMIDELE,
LEKKEKAITSEVOODRITELE JA
LEKKEKAITSEÜMBRISTELE

Leak detection systems - Part 7: Requirements and
test/assessment methods for interstitial spaces, leak
detection linings and leak detection jackets

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13160-7:2016 sisaldab Euroopa standardi EN 13160-7:2016 ingliskeelset teksti.	This Estonian standard EVS-EN 13160-7:2016 consists of the English text of the European standard EN 13160-7:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 06.07.2016.	Date of Availability of the European standard is 06.07.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 23.020.01, 23.040.99, 29.260.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Leak detection systems - Part 7: Requirements and
test/assessment methods for interstitial spaces, leak
detection linings and leak detection jackets

Systèmes de détection de fuites - Partie 7: Exigences et
méthodes d'essai/d'évaluation pour les espaces
interstitiels, les détecteurs de fuite des revêtements et
les détecteurs de fuite d'enveloppes

Leckanzeigesysteme - Teil 7: Anforderungen und Prüf-
/Bewertungsverfahren für Überwachungsräume,
Leckschutzauskleidungen und
Leckschutzmantelungen

This European Standard was approved by CEN on 8 April 2016.

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-CENELEC 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-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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword	4
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Requirements.....	7
4.1 Effectiveness of leak detection lining kits and leak detection jacket kits.....	7
4.1.1 Tightness against liquid and vapour.....	7
4.1.2 Permeability of leak detection linings and leak detection jackets.....	7
4.1.3 Free passage of liquid in the interstitial space	8
4.1.4 Free passage of air	8
4.1.5 Flow resistance after impact of stored media	8
4.1.6 Mechanical resistance against the imposed load by the stored medium	8
4.1.7 Chemical resistance	15
4.2 Durability of effectiveness.....	15
4.2.1 Durability against temperature.....	15
4.2.2 Durability against chemical attack.....	15
4.2.3 Durability against mechanical load.....	15
5 Testing, assessment and sampling methods.....	15
5.1 Effectiveness of leak detection lining kits and leak detection jacket kits.....	15
5.1.1 Tightness against liquid and gas	15
5.1.2 Permeability	17
5.1.3 Free passage of liquid in the interstitial space	18
5.1.4 Free passage of air	19
5.1.5 Flow resistance after impact of stored media	22
5.1.6 Mechanical resistance against the imposed load by the stored medium	25
5.1.7 Chemical resistance	25
5.2 Durability of effectiveness.....	25
5.2.1 Durability against temperature.....	25
5.2.2 Durability against chemical attack.....	25
5.2.3 Durability against mechanical load.....	25
6 Assessment and verification of constancy of performance – AVCP	27
6.1 General.....	27
6.2 Type testing.....	28
6.2.1 General.....	28
6.2.2 Test samples, testing and compliance criteria.....	29
6.2.3 Test reports.....	29
6.2.4 Shared other party results.....	29
6.2.5 Cascading determination of the product type results	30
6.3 Factory production control (FPC)	31
6.3.1 General.....	31
6.3.2 Requirements.....	32
6.3.3 Product specific requirements.....	34
6.3.4 Procedure for modifications.....	35

6.3.5	One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity.....	35
7	Marking, labelling and packaging.....	36
8	Environmental aspects.....	37
Annex A (normative) Determination of the interstitial space volume for class I-systems		38
A.1	Test equipment.....	38
A.2	Preparation.....	38
A.3	Procedure.....	39
A.4	Evaluation.....	41
Annex B (informative) Environmental aspects.....		42
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation 305/2011/EU		44
ZA.1	Scope and relevant characteristics	44
ZA.2	Procedure for AVCP of leak detection linings and leak detection jackets	45
ZA.2.1	System(s) of AVCP.....	45
ZA.2.2	Declaration of performance (DoP)	46
ZA.2.2.1	General.....	46
ZA.2.2.2	Content.....	47
ZA.2.2.3	Example of DoP	47
ZA.3	CE marking and labelling.....	49

European foreword

This document (EN 13160-7:2016) has been prepared by Technical Committee CEN/TC 393 "Equipment for storage tanks and for filling stations", the secretariat of which is held by DIN.

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 2016, and conflicting national standards shall be withdrawn at the latest by March 2018.

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 13160-7:2003.

This document has been prepared under a mandate 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.

According to edition 2003 the following fundamental changes are given:

- requirements and tests for permeation added;
- material properties revised;
- requirements from EN 13160-1:2003 included, which are no longer contained in EN 13160-1:2016.

This European Standard *Leak detection systems* consists of 7 parts:

- *Part 1: General principles*
- *Part 2: Requirements and test/assessment methods for pressure and vacuum systems*
- *Part 3: Requirements and test/assessment methods for liquid systems for tanks*
- *Part 4: Requirements and test/assessment methods for sensor based leak detection systems*
- *Part 5: Requirements and test/assessment methods for in-tank gauge systems and pressurized pipework systems*
- *Part 6: Sensors in monitoring wells*
- *Part 7: Requirements and test/assessment methods for interstitial spaces, leak detection linings and leak detection jackets*

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta,

Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

This document is a preview generated by EVS

1 Scope

This European Standard gives requirements and the corresponding test/assessment methods applicable to leak detection lining kits and leak detection jacket kits. Leak detection lining kits and leak detection jackets kits intended to be used to create an interstitial space or leakage containment in single skin underground or above ground, non-pressurized, tanks designed for water polluting liquids. The kit has to be used only in conjunction with leak detection kits covered by EN 13160-2 to EN 13160-4.

2 Normative references

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

EN 228, *Automotive fuels — Unleaded petrol — Requirements and test methods*

EN 495-5, *Flexible sheets for waterproofing — Determination of foldability at low temperature — Part 5: Plastic and rubber sheets for roof waterproofing*

EN 1107-2, *Flexible sheets for waterproofing — Determination of dimensional stability — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 1849-2, *Flexible sheets for waterproofing — Determination of thickness and mass per unit area — Part 2: Plastic and rubber sheets*

EN 10300:2005, *Steel tubes and fittings for onshore and offshore pipelines — Bituminous hot applied materials for external coating*

EN 13121-1, *GRP tanks and vessels for use above ground — Part 1: Raw materials — Specification conditions and acceptance conditions*

EN 13121-2:2003, *GRP tanks and vessels for use above ground — Part 2: Composite materials — Chemical resistance*

EN 13160-1:2016, *Leak detection systems — Part 1: General principles*

EN 13160-2:2016, *Leak detection systems — Part 2: Requirements and test/assessment methods for pressure and vacuum systems*

EN 13160-3:2016, *Leak detection systems — Part 3: Requirements and test/assessment methods for liquid systems for tanks*

EN 13160-4:2016, *Leak detection systems — Part 4: Requirements and test/assessment methods for sensor based leak detection systems*

EN 14879-4:2007, *Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media — Part 4: Linings on metallic components*

EN ISO 62, *Plastics — Determination of water absorption (ISO 62)*

EN ISO 75-1, *Plastics — Determination of temperature of deflection under load — Part 1: General test method (ISO 75-1)*

EN ISO 75-2, *Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite (ISO 75-2)*

EN ISO 75-3, *Plastics — Determination of temperature of deflection under load — Part 3: High-strength thermosetting laminates and long-fibre-reinforced plastics (ISO 75-3)*

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

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178)*

EN ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1)*

EN ISO 179-2, *Plastics — Determination of Charpy impact properties — Part 2: Instrumented impact test (ISO 179-2)*

EN ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1)*

EN ISO 527-3, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets (ISO 527-3)*

EN ISO 604, *Plastics — Determination of compressive properties (ISO 604)*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1)*

EN ISO 24345, *Resilient floor coverings — Determination of peel resistance (ISO 24345)*

ISO 2528, *Sheet materials — Determination of water vapour transmission rate — Gravimetric (dish) method*

ISO 6133, *Rubber and plastics — Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13160-1:2016 apply.

4 Requirements

4.1 Effectiveness of leak detection lining kits and leak detection jacket kits

4.1.1 Tightness against liquid and vapour

The integrity of the leak detection linings and leak detection jackets shall be maintained under all operating pressures.

4.1.2 Permeability of leak detection linings and leak detection jackets

The permeation shall be according to Table 1 and Table 2.

No condensation of vapour of the stored product in the interstitial space should occur.