

<b>STN</b>	<b>Systémy zisťovania netesností. Časť 5: Požiadavky a skúšobné metódy/metódy hodnotenia meracích systémov v nádrži a tlakových potrubných systémov.</b>	<b>STN EN 13160-5</b>
		69 8979

Leak detection systems - Part 5: Requirements and test/assessment methods for in-tank gauge systems and pressurised pipework systems

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/16

Obsahuje: EN 13160-5:2016

Oznámením tejto normy sa od 30.04.2018 ruší  
STN EN 13160-5 (69 8979) z januára 2005

**123715**

---

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, 2017  
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy  
rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

EUROPEAN STANDARD

EN 13160-5

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2016

ICS 23.020.10; 23.040.99

Supersedes EN 13160-5:2004

English Version

## Leak detection systems - Part 5: Requirements and test/assessment methods for in-tank gauge systems and pressurised pipework systems

Systèmes de détection de fuites - Partie 5: Exigences et méthodes d'essai/d'évaluation des systèmes de détection de fuites en citernes et des systèmes de tuyauterie sous pression

Leckanzeigesysteme - Teil 5: Anforderungen und Prüf-/Bewertungsverfahren für Tankinhaltsmesssysteme und druckbeaufschlagte Rohrleitungen

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**

<b>Contents</b>	<b>Page</b>
European foreword.....	5
<b>1</b> Scope.....	<b>6</b>
<b>2</b> Normative references.....	<b>6</b>
<b>3</b> Terms, definitions, symbols and abbreviated terms.....	<b>7</b>
<b>3.1</b> Terms and definitions .....	<b>7</b>
<b>3.2</b> Symbols and abbreviated terms .....	<b>7</b>
<b>4</b> Requirements.....	<b>7</b>
<b>4.1</b> Effectiveness of leak detection kits .....	<b>7</b>
<b>4.1.1</b> General.....	<b>7</b>
<b>4.1.2</b> Electrical or signal cable of the measuring device .....	<b>8</b>
<b>4.1.3</b> Leak detection kit.....	<b>8</b>
<b>4.1.4</b> Measures volumetric loss.....	<b>8</b>
<b>4.1.5</b> Requirements for software.....	<b>9</b>
<b>4.1.6</b> Mechanical construction .....	<b>10</b>
<b>4.1.7</b> Effects of thermal contraction .....	<b>10</b>
<b>4.1.8</b> Alarm device .....	<b>10</b>
<b>4.2</b> Durability of effectiveness.....	<b>10</b>
<b>4.2.1</b> Durability of effectiveness against temperature .....	<b>10</b>
<b>4.2.2</b> Durability of effectiveness against chemical attack .....	<b>10</b>
<b>4.2.3</b> Durability of effectiveness against hydraulic shock (only for measuring devices used on pressurized line) .....	<b>10</b>
<b>4.2.4</b> Durability of effectiveness against fatigue and mechanical wear\degradation, (only for measuring devices used on pressurized line) .....	<b>10</b>
<b>4.2.5</b> Durability of effectiveness against microbiological growth on critical surfaces involved in the measurement process .....	<b>10</b>
<b>5</b> Testing, assessment and sampling methods.....	<b>11</b>
<b>5.1</b> Effectiveness of leak detection kits .....	<b>11</b>
<b>5.1.1</b> General.....	<b>11</b>
<b>5.1.2</b> Disconnection of the electrical or signal cable of the measuring device .....	<b>11</b>
<b>5.1.3</b> Leak detection kit.....	<b>11</b>
<b>5.1.4</b> Measures volumetric loss.....	<b>11</b>
<b>5.1.5</b> Software.....	<b>25</b>
<b>5.1.6</b> Mechanical construction .....	<b>25</b>
<b>5.1.7</b> Effects of thermal contraction .....	<b>26</b>
<b>5.1.8</b> Alarm Device.....	<b>26</b>
<b>5.2</b> Durability of Effectiveness.....	<b>26</b>
<b>5.2.1</b> Durability of effectiveness against temperature.....	<b>26</b>
<b>5.2.2</b> Durability of effectiveness against chemical attack .....	<b>26</b>
<b>5.2.3</b> Durability of effectiveness against hydraulic shock (only for measuring devices used on pressurized line) .....	<b>28</b>
<b>5.2.4</b> Durability of effectiveness against fatigue and mechanical wear\degradation, (only for measuring devices used on pressurized line) .....	<b>28</b>
<b>5.2.5</b> Durability of effectiveness against microbiological growth on critical surfaces involved in the measurement process .....	<b>29</b>
<b>6</b> Assessment and verification of constancy of performance — AVCP .....	<b>29</b>

6.1	General .....	29
6.2	Type testing .....	29
6.2.1	General .....	29
6.2.2	Test samples, testing and compliance criteria.....	30
6.2.3	Test reports .....	30
6.2.4	Shared other party results .....	31
6.2.5	Cascading determination of the product type results.....	31
6.3	Factory production control (FPC).....	32
6.3.1	General .....	32
6.3.2	Requirements.....	33
6.3.3	Product specific requirements .....	35
6.3.4	Procedure for modifications.....	36
6.3.5	One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity .....	36
7	Marking, labelling and packaging.....	37
<b>Annex A (normative) Acquisition of field data to provide a standard database for testing software leak detection systems Category A .....</b>		<b>38</b>
A.1	Objective .....	38
A.2	Requirements.....	39
A.3	Equipment.....	40
A.4	Method.....	41
A.5	Data up-loading and verification .....	43
A.6	Induced leak rates – quantitative systems .....	44
A.7	Induced leak rates – qualitative systems.....	44
A.8	Test sequence.....	44
A.9	Simulated leak test results.....	45
A.10	Qualification for use .....	45
A.11	Statistical analysis.....	46
<b>Annex B (informative) Acquisition of field data to provide a standard database for testing software leak detection systems Category B(2) .....</b>		<b>51</b>
B.1	General .....	51
B.2	File sorting and selection.....	51
B.3	Data set Requirements .....	51
B.4	Induced leak rates – quantitative systems.....	52
B.5	Induced leak rates – qualitative systems.....	52
B.6	Test sequence.....	52
B.7	Evaluation of simulated leak test results.....	53
B.8	Qualification for use .....	53
B.9	Statistical analysis.....	53
B.10	Comparison of variable and constant leak rate pairs .....	56
B.11	Validation of conditions of use .....	57

<b>Annex C (normative) Leak detection systems Category B(1)</b> .....	<b>59</b>
<b>C.1 Preparation</b> .....	<b>59</b>
<b>C.2 Stabilization and trial run</b> .....	<b>59</b>
<b>C.3 Procedure</b> .....	<b>59</b>
<b>C.4 Test results</b> .....	<b>62</b>
<b>C.5 Evaluation</b> .....	<b>63</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive Construction Products Regulation 305/2011/EU</b> .....	<b>65</b>
<b>ZA.1 Scope and relevant characteristics</b> .....	<b>65</b>
<b>ZA.2 Procedure for AVCP of leak detection systems based on volumetric loss from within the tank and/or pipework system</b> .....	<b>66</b>
<b>ZA.2.1 System(s) of AVCP</b> .....	<b>66</b>
<b>ZA.2.2 Declaration of performance (DoP)</b> .....	<b>67</b>
<b>ZA.2.2.1 General</b> .....	<b>67</b>
<b>ZA.2.2.2 Content</b> .....	<b>67</b>
<b>ZA.2.2.3 Example of DoP</b> .....	<b>68</b>
<b>ZA.3 CE marking and labelling</b> .....	<b>70</b>
<b>Bibliography</b> .....	<b>73</b>

## European foreword

This document (EN 13160-5:2016) 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 January 2017, and conflicting national standards shall be withdrawn at the latest by April 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 13160-5:2004.

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 EN 13160-5:2004 the following fundamental changes are given:

- Requirement for a device for simulating a leak deleted;
- requirements from EN 13160-1:2003 included, which are no longer contained in EN 13160-1:2016;
- Pressure line leak detection kits included.

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 leak detection linings*

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.

## 1 Scope

This European Standard gives requirements and corresponding test\assessment methods applicable to leak detection kits, based on volumetric loss from within the tank and/or pipework system. The kits usually comprise:

- Measuring Device
- Evaluation Device
- Alarm Device

Intended use:

Leak Detection kits are intended to be used in\with single or double skin underground tanks or single or double skin underground and/or aboveground pipework designed for flammable liquids having a flash point not exceeding 100 °C.

## 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 590, *Automotive fuels — Diesel — Requirements and test methods*

EN 976-1, *Underground tanks of glass-reinforced plastics (GRP) — Horizontal cylindrical tanks for the non-pressure storage of liquid petroleum based fuels — Part 1: Requirements and test methods for single wall tanks*

EN 981:1996+A1:2008, *Safety of machinery — System of auditory and visual danger and information signals*

EN 12285-1, *Workshop fabricated steel tanks — Part 1: Horizontal cylindrical single skin and double skin tanks for the underground storage of flammable and non-flammable water polluting liquids*

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

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

EN 13352:2012, *Specification for the performance of automatic tank contents gauges*

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 60296, *Fluids for electrotechnical applications — Unused mineral insulating oils for transformers and switchgear (IEC 60296)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications (IEC 61672-1)*

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**