BS EN 13160-4:2016

BSI Standards Publication

Leak detection systems

Part 4: Requirements and test/assessment methods for sensor based leak detection systems

bsi.

National foreword

This British Standard is the UK implementation of EN 13160-4:2016. It supersedes BS EN 13160-4:2003 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PVE/393/2, Leak detection devices.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Leak detection systems - Part 4: Requirements and test/assessment methods for sensor based leak detection systems

Systèmes de détection de fuites - Partie 4: Exigences et méthodes d'essai/d'évaluation des systèmes de détection de fuites par capteur

Leckanzeigesysteme - Teil 4: Anforderungen und Prüf-/Bewertungsverfahren für sensorbasierte Leckanzeigesysteme

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

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COMITÉ EUROPÉEN DE NORMALISATION
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Contents

European foreword

This document (EN 13160-4:2016) has been prepared by Technical Committee CEN/TC 393 “Equipment for tanks and 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of an identical text or by endorsement, at the latest by January 2017, and conflicting national standards shall be withdrawn at the latest by April 2018.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 13160-4:2003.

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 from EN 13160-1:2003 included, which are no longer contained in EN 13160-1:2016;

— new structure — requirements, testing, marking divided;

— new test procedure for vapour sensors and reusability of vapour sensors;

— test liquids revised.

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 pipe work 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 the corresponding test/assessment methods applicable to sensor based leak detection systems (leak detection kits). The leak detection kits are intended to be used in interstitial spaces, leakage containments or monitoring wells. The leak detection kits are usually composed by:

— sensing device(s);

— evaluation device;

— alarm device.

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

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 60079-29-1, *Explosive atmospheres — Part 29-1: Gas detectors — Performance requirements of detectors for flammable gases (IEC 60079-29-1)*

3 Terms and definitions

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

3.1
re-usability of the sensor
capability of a sensor to be used again after already detected liquid or vapour

4 Requirements

4.1 Effectiveness

4.1.1 General

This type of leak detection kit is classified according to EN 13160-1:2016 as class III.

The general requirements on leak detection systems according to Clause 5 of EN 13160-1:2016 shall be met.

Liquid or vapour sensors shall be installed in such a way that they can detect specific liquids or their vapours present in or entering the leakage containment, interstitial space or monitoring wells. The sensor shall react within a time specified by the manufacturer.

The leakage containment can take the form of a

— sump or riser designed to contain spills from leaks originating from pipework or pumps/dispensers;

— bund, designed to contain leakage from an above ground storage tank or from any other above ground facility containing liquids;

— other facilities in which sensors can be installed to detect the presence of liquids or vapours.

An alarm device according to EN 13160-3:2016, 4.1.3.5, shall be provided.

In the event of a sensor disconnection of the power supply an alarm condition shall result.

In case of a short circuit between two conductors in the connection between sensor and evaluation device an alarm shall be triggered.

4.1.2 Presence of liquids

Liquid sensors shall detect specific liquids they may come into contact with (e.g. stored/conveyed product, water), according to the following requirements:

Category 1: Non-discriminating sensor.

The sensor shall detect the presence of any liquid (stored/conveyed product and water).

Category 2: Discriminating sensor.

Category 2A: The sensor shall detect the presence of liquid stored/conveyed product or water and discriminates between the two aforementioned.

Category 2B: The sensor shall detect the presence of a film of liquid (stored/conveyed product) with a vapour pressure ≥ 30 kPa at 20 °C floating on water.

4.1.3 Presence of vapours

The sensor shall detect specific vapours from flammable liquids with a vapour pressure ≥ 30 kPa at 20 °C when their concentration is a volume fraction less than or equal to 1000×10^{-6}.

4.1.4 Re-usability of the sensor

Any re-useable sensor shall be able to detect a new leak condition after removal of liquid or vapour. The recovery time shall be:

— not higher than 24 h from after the removal of the vapour leak conditions for any vapour sensors;

— not higher than 7 days from after the removal of the liquid leak conditions for any liquid sensor (or after the removal of the water for the vapour sensors) that doesn't need any manual reset procedure.

4.1.5 Requirements for software, (only if provided)

The software, where provided, shall have a facility for self-checking by fulfilling the following requirements:

— a self-diagnostic mode to test the integrity of the system at start up and periodically during use. A negative result of self-diagnostic mode shall result in a distinguishable alarm condition;

— a facility to check the consistency of the input and output data, malfunction shall result in a distinguishable alarm condition.

4.2 Durability of effectiveness

4.2.1 Durability of effectiveness against temperature

The working temperature ranges for leak detection sensors shall be as follows:

— Type 1: −20 °C to +60 °C

— Type 2: 0 °C to +40 °C

— Type 3: −40 °C to +40 °C

4.2.2 Durability of effectiveness against chemical attack

Parts of leak detection kits which can come into contact with the stored/conveyed liquid/water or its vapour and air shall be resistant.

5 Testing, assessment and sampling methods

5.1 Effectiveness of the leak detection systems

5.1.1 General

For the tests minimum one sample shall be provided by the manufacturer.

For the tests the following documentation shall be provided by the manufacturer:

— documentation according to Clause 7;

— datasheet of the parts of the leak detection kit;

— electrical diagrams of the parts of the leak detection kit;

— design and application drawings;

— lists of the parts used including material data.

Leak detection kits shall be inspected visually to confirm that the sample complies with the documentation.

5.1.2 Presence of liquid

5.1.2.1 Non-discriminating liquid sensors (Category 1)

5.1.2.1.1 Test equipment

— mounting device for fixing the sensor;

— temperature sensor with an accuracy of ± 1 K;

— vessel with a diameter of 100 mm and with a volume of at least 1 l;

— time measuring device with an accuracy of ± 1 s;

— according to the signal of the sensor a measuring device regarding measuring current or voltage or an oscilloscope with an accuracy of 1 %;

— number of test samples (sensor or sensor with evaluation and alarm device);

— potable water;

— stored/conveyed product or the following test liquids:

a) for unleaded petrol according to EN 228

1) with maximum 5 % ethanol

47,5 % (V/V) toluene

30,4 % (V/V) isooctane (2,2,4-trimethylpentane)

17,1 % (V/V) n-heptane

3,0 % (V/V) methanol

2,0 % (V/V) butanol

2) with > 5 % (V/V) and ≤ 20 % (V/V) ethanol

20 % (V/V) ethanol

37,7 % (V/V) toluene

24,2 % (V/V) isooctane (2,2,4- trimethylpentane)

13,5 % (V/V) n-heptane

3 % (V/V) methanol

1,6 % (V/V) butanol

The tolerance for the component of the test liquid shall be 0,1 %.

b) for other petroleum products: liquids according to EN 14879-4:2007, Annex C.

5.1.2.1.2 Preparation

The tests shall be carried out at a temperature of (20 ± 5) °C.

The output values of the current or voltage or the signal frequency for sensors without evaluation/alarm device shall be measured at the beginning of the test.

When using an evaluation device this shall indicate the operation condition.

a) The sensor shall be installed in the mounting device.

The vessel shall be filled with potable water up to 75 %.

b) The sensor shall be installed in the mounting device.

The vessel shall be filled with test liquid up to 75 %.

5.1.2.1.3 Procedure

a) The test shall be carried out with at least 3 samples. The sensor shall be lowered into the potable water until the alarm condition is reached and the alarm device activates an alarm accordingly. When testing an analogue sensor the measured signal shall change accordingly.

b) According to the test procedure a) but the test shall be carried out with test liquid.

5.1.2.1.4 Evaluation

The test shall be deemed to have passed if:

— the times according to 4.1.1 for reaching the activation point when lowering the test samples into potable water or test liquid are met;

— the measured immersion depth complies with the test liquid height required to activate an alarm as specified by the manufacturer.

The actual reaction times, the test liquid height and water height shall be recorded and given in the test report.

5.1.2.2 Discriminating liquid sensors of Category 2A

5.1.2.2.1 Test equipment

According to 5.1.2.1.1.

5.1.2.2.2 Preparation

According to 5.1.2.1.2.

5.1.2.2.3 Procedure

According to 5.1.2.1.3.

5.1.2.2.4 Evaluation

The test shall be deemed to have passed if:

— the times according to 4.1.1 for reaching the activation point when lowering the test samples into test liquid are met;

— the test liquid height measured is in accordance with the specification of the manufacturer and resulting in a test liquid alarm;

— the potable water height measured is in accordance with the specification of the manufacturer and resulting in a water alarm.

The actual reaction times, the test liquid height and water height shall be recorded and given in the test report.

5.1.2.3 Discriminating liquid sensors of category 2B

5.1.2.3.1 Test equipment

According to 5.1.2.1.1 and additional a pipette with a scale with an accuracy of 1 %.

5.1.2.3.2 Preparation

The tests shall be carried out at a temperature of (20 ± 5) °C.

The output values of the current or voltage or the signal frequency for sensors without evaluation/alarm device shall be measured at the beginning of the test.

When using an evaluation device this shall indicate the operation condition.

a) Test with potable water:

   The sensor shall be installed in the mounting device.

   The vessel shall be filled with potable water up to 75 %.

b) Test with test liquid film on water:

   The sensor shall be installed in the mounting device.

   The vessel shall be filled with potable water up to 75 %.

The sensor shall be lowered into the vessel. The immersion depth into the potable water shall be chosen in a way that a covering with potable water is reached according to the specification of the manufacturer.

The pipette with the test liquid shall be prepared.

5.1.2.3.3 Procedure

a) Test with potable water:

   The sensor shall be suspended in air and the alarm device shall be activated accordingly.

   When the sensor is immersed into the potable water the alarm device shall be de-activated.

   The test shall be carried out with at least 3 samples.

b) Test with test liquid film on water:

   With a pipette, test liquid shall be put on the potable water drop by drop until the sensor activates an alarm. The quantity of the test liquid shall be recorded and shall be calculated into a film thickness.

   The test shall be carried out with at least 3 samples.

5.1.2.3.4 Evaluation

The test shall be deemed to have passed if:

a) Test with potable water:

   — an alarm condition appears in air and ceases after immersion in potable water.

b) Test with test liquid film on water:

— the calculated film thickness is smaller or equal to the film thickness given by the manufacturer.

5.1.3 Presence of vapours

5.1.3.1 General

Test equipment, preparation and procedure according to EN 60079-29-1 at three samples for any vapour or test gas. The selection of the vapour or test gas shall be done in agreement with the manufacturer.

5.1.3.2 Evaluation

The test shall be deemed to have passed if the reaction time given by the manufacturer according to 4.1.1 is met and the alarm condition according to 4.1.3 appears for any sample.

5.1.4 Re-usability of the discriminating and non-discriminating sensors

5.1.4.1 Test equipment

— Test rig with a vertical mobile lifting device for moving the sensor;

— temperature sensor with an accuracy of ± 1 K;

— vessel with a volume of at least 1 l;

— at least 1 l of potable water, if required;

— time measuring device with an accuracy of ± 1 s;

— according to the signal of the sensor a measuring device regarding measuring current or voltage or an oscilloscope with an accuracy of 1 %;

— number of test samples (sensor or sensor with evaluation and alarm device);

— at least 1 l of stored/conveyed product or the following test liquids:

a) for unleaded petrol according to EN 228

1) with maximum 5 % ethanol

47,5 % (V/V) toluene,

30,4 % (V/V) isooctane (2,2,4-trimethylpentane)

17,1 % (V/V) n-heptane

3,0 % (V/V) methanol

2,0 % (V/V) butanol

2) with > 5 % (V/V) and ≤ 20 % (V/V) ethanol

20 % (V/V) ethanol

37,7 % (V/V) toluene

24,2 % (V/V) isooctane (2,2,4-trimethylpentane)

13,5 % (V/V) n-heptane

3 % (V/V) methanol

1,6 % (V/V) butanol

The tolerance for the component of the test liquid shall be 0,1 %.

b) for other petroleum products: liquids according to EN 14879-4:2007, Annex C.

5.1.4.2 Preparation

The test shall be carried out at a temperature of (20 ± 5) °C.

At the beginning of the test, the sensor shall be installed above the test liquid.

The output values of the current or voltage or the signal frequency for sensors without evaluation/alarm device shall be measured at the beginning of the test.

When using an evaluation device this shall indicate the operation condition.

5.1.4.3 Procedure

The sensor shall be lowered into a test liquid until the alarm condition is reached or until the signal values have reached the value for the alarm.

After removal of the sensor from the test liquid or for liquid sensors of category 2B, when lowered into the potable water the alarm shall cease. The time taken for the alarm condition to cease shall be recorded and given in the test report.

5.1.4.4 Evaluation

The test shall be deemed to have passed if the times elapsed for alarm condition to cease does not exceed the value according to 4.1.4.

5.1.5 Re-usability of vapour sensors

5.1.5.1 General

Test equipment, preparation and procedure according to 5.1.3.1.

5.1.5.2 Evaluation

The test shall be deemed to have passed if for each sample and vapour or test gas, the recovery time is < 24 h after the removal of the leak conditions.

5.1.6 Software (only if provided)

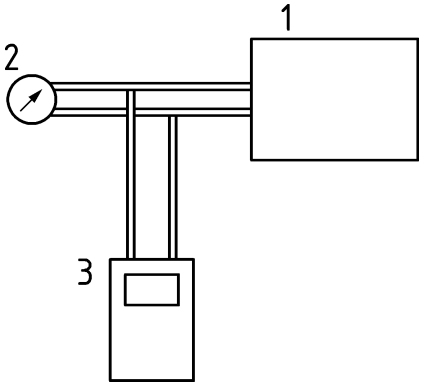
5.1.6.1 Test equipment

Transformer (variable power supply)

Measuring device for current/voltage

5.1.6.2 Preparation

Test set-up according to Figure 1.



Key

1 test sample

2 variable power supply

3 measuring device

Figure 1 — Test setup for software

The power supply is done over a transformer to vary the power supply.

5.1.6.3 Test method

The test shall be carried out at (20 ± 5) °C.

Check of the software documentation whether and for which situations the self-diagnostic is defined. Followed by a check on the hardware.

The input data are modified and in the result shall be an alarm/error message. This alarm condition shall be different from the alarm coming out of the intended use.

5.1.6.4 Evaluation

The test deemed to have been passed if the software

— provides an alarm condition in case of a negative result of self-diagnostic mode;

— has a facility to check the consistency of the input and output data, malfunction shall result in an alarm condition.

5.2 Durability of effectiveness

5.2.1 Durability of effectiveness against temperature

5.2.1.1 Test equipment

— An environmental chamber with an opening on the top, the temperature of which can be varied over the range from −40 °C to +60 °C;

— test rack with vertical hub to move the sensor;

— basin;

— cycle counter;

— temperature sensor;

— suitable quantities of test liquid or water according to manufacturer's instruction.

5.2.1.2 Preparation

For the test the sensor should install in the test rack over the environmental chamber. The test liquid should fill in the basin so the sensor could be dip in the liquid. Depending upon requirement the chamber will be heating or cooling with the liquid or with the sensor

5.2.1.3 Test method

5.2.1.3.1 General

During one cycle the sensor shall be immersed in the liquid until the alarm is triggered. Then the sensor shall be removed from the liquid until the alarm condition is cleared.

200 cycles or 4 weeks, whichever is shorter at each minimum and maximum temperature of each temperature type shall be carried out.

5.2.1.3.2 Test of the minimum temperature durability

Test 1

— The liquid shall be cooled in the chamber to the minimum temperature range of the temperature type.

— The sensor shall be brought to ambient temperature.

— Then the cycles shall be started.

— After the end of each cycle the sensor shall be brought back to ambient temperature.

Test 2

— The liquid and the sensor shall be cooled together in the chamber to the minimum temperature range of the temperature type.

— The sensor position shall remain in the chamber for all cycles.

— Then the cycles shall be started.

5.2.1.3.3 Test of the maximum temperature durability

Test 1 –

— The liquid shall be heated in the chamber to the maximum temperature range of the temperature type.

— The sensor shall be brought to ambient temperature.

— Then the cycles shall be started.

— After the end of each cycle the sensor shall be brought back to ambient temperature.

Test 2 –

— The liquid and the sensor shall be heated together in the chamber to the maximum temperature range of the temperature type.

— The sensor position shall remain in the chamber for all cycles.

— Then the cycles shall be started.

5.2.1.4 Evaluation

The test deemed to have been passed if functionality according to 5.1.2 or 5.1.3 and 5.1.4.1, 5.1.4.2, 5.1.4.3 or 5.1.4.4 is achieved.

5.2.2 Durability of effectiveness against chemical attack

5.2.2.1 Test equipment

— Test liquids:

— for petroleum products the following test liquids:

a) for unleaded petrol according to EN 228

1) with maximum 5 % ethanol

47,5 % (V/V) toluene

30,4 % (V/V) isooctane (2,2,4-trimethylpentane)

17,1 % (V/V) n-heptane

3,0 % (V/V) methanol

2,0 % (V/V) butanol

2) with > 5 % (V/V) and ≤ 20 % (V/V) ethanol

20 % (V/V) ethanol

37,7 % (V/V) toluene

24,2 % (V/V) isooctane (2,2,4-trimethylpentane)

13,5 % (V/V) n-heptane

3 % (V/V) methanol

1,6 % (V/V) butanol

The tolerance for the component of the test liquid shall be 0,1 %.

b) for other petroleum products: liquids according to EN 14879-4:2007, Annex C;

— for acids: 60 % sulphuric acid;

— for lyes: 40 % soda lye;

— for water not intended for human consumption: water;

— liquid and vapour tight container.

5.2.2.2 Preparation

The parts of the leak detection kit, which are exposed to the vapour and/or the liquid, shall be identified.

If EN 12285-1 is applicable, the parts of the leak detection kit, which are exposed to the vapour or the liquid may not be tested and the listed materials apply.

5.2.2.3 Test method

The tests shall be carried out at a temperature of (20 ± 5) °C.

The parts of the leak detection kit, which are exposed to the vapour or the liquid, shall be complete immersed into the test liquid for 4 weeks. Then an exposition into the saturated vapour over the test liquid for another 4 weeks shall follow.

After the test duration the parts of the leak detection kit shall be cleaned and dried. The parts shall be checked for damage. Where necessary, demounted components shall be reassembled so that the functionality can be tested.

The functionality of the leak detection kit shall be tested according to 5.1.2 or 5.1.3 and 5.1.4.1, 5.1.4.2, 5.1.4.3 or 5.1.4.4.

5.2.2.4 Evaluation

The test deemed to have been passed if:

— the material is in the durability list of the EN 12285-1;

— no visible failure or deformation after the storage in the test liquid and vapour and the functionality according to 5.1.2 or 5.1.3 and 5.1.4.1, 5.1.4.2, 5.1.4.3 or 5.1.4.4 are given.

6 Assessment and verification of constancy of performance - AVCP

6.1 General

The compliance of sensor based leak detection systems with the requirements of this standard and with the performances declared by the manufacturer in the DoP shall be demonstrated by:

— determination of the product type;

— factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests. (e.g. use of previously existing data, CWFT and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

NOTE 1 Same AVCP system means testing by an independent third party.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family

NOTE 2 Products may be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

— at the beginning of the production of a new or modified sensor based leak detection systems (unless a member of the same product range), or

— at the beginning of a new or modified method of production (where this may affect the stated properties), or

— they shall be repeated for the appropriate characteristic(s), whenever a change occurs in the sensor based leak detection systems design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the sensor based leak detection systems manufacturer to ensure that the sensor based leak detection systems as a whole is correctly manufactured and its component products have the declared performance values.

6.2.2 Test samples, testing and compliance criteria

The number of samples of sensor based leak detection systems to be tested/assessed shall be in accordance with Table 1.

Table 1 — Number of samples to be tested and compliance criteria

Characteristic	Requirement	Assessment method	No. of samples	Compliance criteria
Effectiveness:				
— Presence of liquids;	4.1.2	5.1.2		4.1.2
— Presence of vapour;	4.1.3	5.1.3	3	4.1.3
— Re-usability;	4.1.4	5.1.4, 5.1.5		4.1.4
software (only if provided)	4.1.5	5.1.6		4.1.5
Durability of effectiveness:				
against temperature;	4.2.1	5.2.1	1	4.2.1
against chemical attacks	4.2.2	5.2.2		4.2.2

6.2.3 Test reports

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the sensor based leak detection systems to which they relate.

6.2.4 Shared other party results

NOTE The sharing of other party results is in principle applicable to all systems of assessment and evaluation of constancy of performance.

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

— the results are known to be valid for products with the same essential characteristics relevant for the product performance;

— in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted[1] to transmit to the manufacturer the results and the test report to be used for the latter's product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;

— the manufacturer using other party results accepts to remain responsible for the product having the declared performances and he also:

  — ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type; and

[1] The formulation of such an agreement can be done by license, contract, or any other type of written consent.

— keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

6.2.5 Cascading determination of the product type results

For some construction products, there are companies (often called "system houses") which supply or ensure the supply of, on the basis of an agreement[2], some or all of the components (e.g. in case of windows: profiles, gaskets, weather strips)[3] to an assembler who then manufactures the finished product (referred to below as the "assembler") in his factory.

Provided that the activities for which such a system house is legally established include manufacturing/assembling of products as the assembled one, the system house may take the responsibility for the determination of the product type regarding one or several essential characteristics of an end product which is subsequently manufactured and/or assembled by other firms in their own factory.

When doing so, the system house shall submit an "assembled product" using components manufactured by it or by others, to the determination of the product type and then make the determination of the product type report available to the assemblers, i.e. the actual manufacturer of the product placed on the market.

To take into account such a situation, the concept of cascading determination of the product type might be taken into consideration in the technical specification, provided that this concerns characteristics for which either a notified product certification body or a notified test laboratory intervene, as presented below.

The determination of the product type report that the system house has obtained with regard to tests carried out by a notified body, and which is supplied to the assemblers, may be used for the regulatory marking purposes without the assembler having to involve again a notified body to undertake the determination of the product type of the essential characteristic(s) that were already tested, provided that:

— the assembler manufactures a product which uses the same combination of components (components with the same characteristics), and in the same way, as that for which the system house has obtained the determination of the product type report. If this report is based on a combination of components not representing the final product as to be placed on the market, and/or is not assembled in accordance with the system house's instruction for assembling the components, the assembler needs to submit his finished product to the determination of the product type;

— the system house has notified to the manufacturer the instructions for manufacturing/assembling the product and installation guidance;

— the assembler (manufacturer) assumes the responsibility for the correct assembly of the product in accordance with the instructions for manufacturing/assembling the product and installation guidance notified to him by the system house;

— the instructions for manufacturing/assembling the product and installation guidance notified to the assembler (manufacturer) by the system house are an integral part of the assembler's Factory Production Control system and are referred to in the determination of the product type report;

[2] This can be, for instance, a contract, license or whatever kind of written agreement, which should also contain clear provisions with regard to responsibility and liability of the component producer (system house, on the one hand, and the assembler of the finished product, on the other hand.

[3] These companies may produce components but they are not required to do so.

— the assembler is able to provide documented evidence that the combination of components he is using, and his way of manufacturing, correspond to the one for which the system house has obtained the determination of the product type report (he needs to keep a copy of the system house's determination of the product type report);

— regardless the possibility of referring, on the basis of the agreement signed with the system house, to the latter's responsibility and liability under private law, the assembler remains responsible for the product being in compliance with the declared performances, including both the design and the manufacture of the product, which is given when he affixes the regulatory marking on his product

6.3 Factory production control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

In case the manufacturer has used shared or cascading product type results, the FPC shall also include the appropriate documentation as foreseen in 6.2.4 and 6.2.5.

6.3.2 Requirements

6.3.2.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory the manufacturer may delegate the action to a person having the necessary authority to:

— identify procedures to demonstrate constancy of performance of the product at appropriate stages;

— identify and record any instance of non-constancy;

— identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves:

— the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;

— the effective implementation of these procedures and instructions;

— the recording of these operations and their results;

— the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

NOTE Manufacturers having an FPC system, which complies with EN ISO 9001 standard and which addresses the provisions of the present European standard are considered as satisfying the FPC requirements of the Regulation (EU) No 305/2011.

6.3.2.2 Equipment

6.3.2.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

6.3.2.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer’s written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

6.3.2.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their compliance. In case supplied kit components are used, the constancy of performance system of the component shall be that given in the appropriate harmonized technical specification for that component.

6.3.2.4 Traceability and marking

Individual products shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

6.3.2.5 Controls during manufacturing process

The manufacturer shall plan and carry out production under controlled conditions.

The manufacturer shall have a certified production control system, e.g. according to EN ISO 9001.

6.3.2.6 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of the characteristics he declares are maintained. The characteristics, and the means of control, are:

— Sensor and evaluation device/alarm device can be tested separately with dedicated test fixtures defined by the manufacturer.

— The test procedure described in 5.1.2.1.3 a) shall be executed for 100 % of all products.

— If the evaluation device is tested separately, analogue stimulus can be used to simulate input behaviour of the sensor.

— The test results shall be evaluated with the criteria described in 5.1.2.1.4, 1st paragraph.

6.3.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the fault has been corrected, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

6.3.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence.

6.3.2.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

6.3.3 Product specific requirements

The FPC system shall address this European Standard and ensure that the products placed on the market comply with the declaration of performance.

The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.:

a) the controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan,

   and/or

b) the verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan.

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a).

In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

6.3.4 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 6.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

6.3.5 One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity

The sensor based leak detection systems produced as a one-off, prototypes assessed before full production is established, and products produced in very low quantities (less than 100 per year) shall be assessed as follows.

For type assessment, the provisions of 6.2.1, 3rd paragraph apply, together with the following additional provisions:

— in case of prototypes, the test samples shall be representative of the intended future production and shall be selected by the manufacturer;

— on request of the manufacturer, the results of the assessment of prototype samples may be included in a certificate or in test reports issued by the involved third party.

The FPC system of one-off products and products produced in very low quantities shall ensure that raw materials and/or components are sufficient for production of the product. The provisions on raw materials and/or components shall apply only where appropriate. The manufacturer shall maintain records allowing traceability of the product.

For prototypes, where the intention is to move to series production, the initial inspection of the factory and FPC shall be carried out before the production is already running and/or before the FPC is already in practice. The following shall be assessed:

— the FPC-documentation; and

— the factory.

In the initial assessment of the factory and FPC it shall be verified:

— that all resources necessary for the achievement of the product characteristics included in this European standard will be available, and

— that the FPC-procedures in accordance with the FPC-documentation will be implemented and followed in practice, and

— that procedures are in place to demonstrate that the factory production processes can produce a product complying with the requirements of this European standard and that the product will be the same as the samples used for the determination of the product type, for which compliance with this European standard has been verified.

Once series production is fully established, the provisions of 6.3 shall apply.

7 Marking, labelling and packaging

Each sensor shall carry the following markings:

— Manufacturer;

— Year of production;

— Unique serial number;

— Class III;

— EN 13160-4;

— Temperature range;

— Identification symbol or number of the certified body, if relevant;

— Category of liquid sensor

— Any re-useable sensor shall mark with “-Re” after the name of category.

Alternatively, the sensor shall be marked with a reference to a specification incorporating the same information.

All leak detection kits shall be accompanied by instruction as to:

— approved liquids — for which the sensor has been tested;

— safe installation, use and maintenance;

— assessment of safe operation condition and possible misuse;

— limitation of equipment, e.g. temperature, no-frost condition;

— essential characteristic of tools used;

— training needed for safe use of equipment

8 Environmental aspects

Environmental aspects should be considered, see Annex A.

Annex A
(informative)

Environmental aspects

A.1 Materials should be selected to optimize product durability and lifetime and consideration should be made to avoiding the selection of rare or hazardous materials.

A.2 Consideration should be made to using recycled or reused materials, and to the selection of materials which can then be subsequently recycled.

A.3 The possibility of marking components to aid to their sorting for disposal/recycling at end of life should also be reviewed.

A.4 Packaging design should consider using recycled materials, and materials that need little energy for their manufacture, and should minimize waste.

A.5 Packaging design should consider subsequent reuse and recycling.

A.6 The size and weight of packaging should be minimized while protecting the products to minimize waste through damage.

A.7 Test fluids should be used and disposed of in accordance with manufacturer's instructions.

Table A.1 — Environmental checklist

Environmental Issue	Stages of the life cycle										All stages
	Acquisition		Production		Use			End-of-Life			
	Raw materials and energy	Pre-manufactured materials and components	Production	Packaging	Use	Maintenance and repair	Use of additional products	Reuse/ Material and Energy Recovery	Incineration without energy recovery	Final disposal	Transportation
Inputs											
Materials	A.1, A.2	A.1, A.2	—	A.5	—	—	—	A.2, A.3, A.5	A.2, A.3, A.5	A.2, A.3, A.5	—
Water	—	—	A.7	—	—	—	—	—	—	—	—
Energy	—	—	—	A.4	—	—	—	—	—	—	A.6
Land	—	—	A.7	—	—	—	—	—	—	—	—
Outputs											
Emissions to air	—	—	A.7	—	—	—	—	—	—	—	—
Discharges to water	—	—	A.7	—	—	—	—	—	—	—	—
Discharges to soil	—	—	A.7	—	—	—	—	—	—	—	—
Waste	—	—	A.7	—	—	—	—	—	—	A.2, A.3, A.5, A.6	—
Noise, vibration, radiation, heat	—	—	—	—	—	—	—	—	—	—	—
Other relevant aspects											
Risk to the environment from accidents or unintended use	—	—	—	—	—	—	—	—	—	—	—
Customer information	—	—	—	—	Clause 4, Clause 7	—	—	—	—	—	—
Comments: -											
NOTE The stage of packaging refers to the primary packaging of the manufactured product. Secondary or tertiary packaging for transportation, occurring at some or all stages of the life cycle, is included in the stage of transportation.											

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/131 PIPES, TANKS and ANCILLARIES not in contact with water intended for human consumption given to CEN by the European Commission and the European Free Trade Association.

If this European standard is cited in the Official Journal of the European Union (OJEU), the clauses of this standard, shown in this annex, are considered to meet the provisions of the relevant mandate, under the Regulation (EU) No. 305/2011.

This annex deals with the CE marking of the sensor based leak detection systems intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as in Clause 1 of this standard related to the aspects covered by the mandate and is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for product and intended use

Product: sensor based leak detection systems **Intended use:** for the detection of the presence of liquid and/or vapour in interstitial spaces, leakage containments or monitoring wells			
Essential Characteristics	**Clauses in this and other European Standard(s) related to essential characteristics**	**Regulatory classes**	**Notes**
Effectiveness — presence of liquid — presence of vapour	 4.1.2 4.1.3	—	—
Effectiveness Re-usability — presence of liquid — presence of vapour	 4.1.4 4.1.4	—	—
Effectiveness software (only if provided)	 4.1.5	—	—
Durability of effectiveness — against temperature — against chemical attack	 4.2.1 4.2.2	—	—

The declaration of the product performance related to certain essential characteristics is not required in those Member States (MS) where there are no regulatory requirements on these essential characteristics for the intended use of the product.

In this case, manufacturers placing their products on the market of these MS are not obliged to determine nor declare the performance of their products with regard to these essential characteristics and the option "No performance determined" (NPD) in the information accompanying the CE marking and in the declaration of performance (see ZA.3) may be used for those essential characteristics.

ZA.2 Procedure for AVCP of sensor based leak detection systems

ZA.2.1 System(s) of AVCP

The AVCP system(s) of sensor based leak detection systems indicated in Table ZA.1, established by EC Decision(s) 1999/472/EC published in Official Journal of the European Communities L 184/42 from 17.7.1999 is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or class(es) of performance.

Table ZA.2 — System(s) of AVCP

Product(s)	Intended use(s)	Level(s) or class(es) of performance	AVCP system(s)
Leakage alarm systems	In installations for the transport/distribution/storage of gas/fuel intended for the supply of building heating/cooling systems, from the external storage reservoir or the last pressure reduction unit of the network to the inlet of the boiler/heater/cooler system of the building	—	3
Leakage alarm system	In installations for the transport/disposal/storage of water not intended for human consumption	—	4
System 3: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.4 System 4: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.5			

The AVCP of the sensor based leak detection systems in Table ZA.2 shall be according to the AVCP procedures indicated in Tables ZA.3.1 to ZA.3.2 resulting from application of the clauses of this or other European Standard indicated therein. The content of tasks of the notified body shall be limited to those essential characteristics as provided for, if any, in Annex III of the relevant mandate and to those that the manufacturer intends to declare.

Table ZA.3.1 — Assignment of AVCP tasks for sensor based leak detection systems under system 3

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	Factory production control (FPC)	— Indicating the correct operating condition of the evaluation device. — Indicating the ability of the alarm device to indicate an alarm condition	6.3.2.6
Tasks for a notified testing laboratory	Determination of the product-type on the basis of type testing (based on sampling carried out by the manufacturer), type calculation, tabulated values or descriptive documentation of the product	All essential characteristics of Table ZA.1	6.2.2

Table ZA.3.2 — Assignment of AVCP tasks for sensor based leak detection systems-under system 4

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	Factory production control (FPC)	— Indicating the correct operating condition of the evaluation device. — Indicating the ability of the alarm device to indicate an alarm condition	6.3.2.6
	Determination of the product-type on the basis of type testing, type calculation, tabulated values or descriptive documentation of the product	All essential characteristics of Table ZA.1 relevant for the intended use which are declared	6.2.2

ZA.2.2 Declaration of performance (DoP)

ZA.2.2.1 General

The manufacturer draws up the DoP and affixes the CE marking on the basis of the different AVCP systems set out in Annex V of the Regulation (EU) No 305/2011:

In case of products under system 3

— the factory production control carried out by the manufacturer; and

— the determination of the product-type on the basis of type testing (based on sampling carried out by the manufacturer), type calculation, tabulated values or descriptive documentation of the product, carried out by the notified testing laboratory.

ZA.2.2.2 Content

The model of the DoP is provided in Annex III of the Regulation (EU) No 305/2011.

According to this Regulation, the DoP shall contain, in particular, the following information:

— the reference of the product-type for which the declaration of performance has been drawn up;

— the AVCP system or systems of the construction product, as set out in Annex V of the CPR;

— the reference number and date of issue of the harmonized standard which has been used for the assessment of each essential characteristic;

— where applicable, the reference number of the Specific Technical Documentation used and the requirements with which the manufacturer claims the product complies.

The DoP shall in addition contain:

a) the intended use or uses for the construction product, in accordance with the applicable harmonized technical specification;

b) the list of essential characteristics, as determined in the harmonized technical specification for the declared intended use or uses;

c) the performance of at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses;

d) where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation in relation to its essential characteristics determined in accordance with the Commission determination regarding those essential characteristics for which the manufacturer shall declare the performance of the product when it is placed on the market or the Commission determination regarding threshold levels for the performance in relation to the essential characteristics to be declared;

e) the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market;

f) for the listed essential characteristics for which no performance is declared, the letters “NPD” (No Performance Determined).

Regarding the supply of the DoP, article 7 of the Regulation (EU) No 305/2011 applies.

The information referred to in Article 31 or, as the case may be, in Article 33 of Regulation (EC) No 1907/2006, (REACH) shall be provided together with the DoP.

ZA.2.2.3 Example of DoP

The following gives an example of a filled-in DoP for vertical air/flue terminals

DECLARATION OF PERFORMANCE

No. 001CPR2015-07-14

1. Unique identification code of the product-type:

— **Leak Detection Kit Class III, Cat X, Type Y**

2 Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

— **Leak Detection Sensor for Liquids Class III, Cat X, Type Y**

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Leak detector kit Class III intended to be used for the detection of the presence of liquid and/or vapour in interstitial spaces, leakage containments or monitoring wells

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

AnyCo SA,

PO Box 21

B-1050 Brussels, Belgium

Tel. +32987654321

Fax: +32123456789

Email: anyco.sa@provider.be

5. Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2):

Anyone Ltd

Flower Str. 24

West Hamfordshire

UK-589645 United Kingdom

Tel. +44987654321

Fax: 44123456789

Email: anyone.ltd@provider.uk

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 3

7. In case of the declaration of performance concerning a construction product covered by a harmonized standard:

Notified factory production control certification body No. 5678 performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment

and evaluation of factory production control and issued the certificate of conformity of the factory production control.

8. Declared performance

Essential characteristics	Performance	Harmonized technical specification
Detecting liquid/vapour	Pass	EN 13160–4:2016
Requirements for software, (only if provided)	Pass	
Durability of effectiveness against temperature	Type 1	
Durability of effectiveness against chemical attack	Petroleum products	

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

……..

(name and function)

…… ……..

(place and date of issue) (signature)

ZA.3 CE marking and labelling

The CE marking symbol shall be in accordance with the general principles set out in Article 30 of Regulation (EC) No 765/2008 and shall be affixed visibly, legibly and indelibly:

— to the sensor based leak detection systems

or

— to a label attached to it.

Where this is not possible or not warranted on account of the nature of the product, it shall be affixed:

— to the packaging

or

— to the accompanying documents.

NOTE In addition to the above, ZA.3 of Annex ZA of the standard could include provisions to be followed where it is intended to split the information accompanying the CE marking and to place them in different locations

The CE marking shall be followed by:

— the last two digits of the year in which it was first affixed;

— the name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity;

— the unique identification code of the product-type;

— the reference number of the declaration of performance;

— the level or class of the performance declared;

— the dated reference to the harmonized technical specification applied;

— the identification number of the notified body,;

— the intended use as laid down in the harmonized technical specification applied.

The CE marking shall be affixed before the construction product is placed on the market. It may be followed by a pictogram or any other mark notably indicating a special risk or use.

In case of Specific Technical Documentation (STD), the reference to be used shall be the number assigned to the STD by the manufacturer

Figures ZA.1 and ZA.2 give examples of the information related to products subject to AVCP under each of the different systems to be given on the sensor based leak detection systems.

CE 8910	*CE marking, consisting of the "CE"-symbol* *Identification number of the notified test laboratory*
AnyCo Ltd, PO Box 21, B-1050, Brussels, Belgium **16** 00001-CPR-2015/05/12	*name and the registered address of the manufacturer, or identifying mark* *Last two digits of the year in which the marking was first affixed* *Reference number of the DoP*
EN 13160–4:2016 Class III **for the detection of the presence of liquid and/or vapour in interstitial spaces, leakage containments or monitoring wells** **Detection of: Presence of liquid** Software: Version X Durability of effectiveness against temperature: Type 1 Durability of effectiveness against chemical attack: Petroleum product	*No. of European Standard applied, as referenced in OJEU* *Unique identification code of the product-type* *Intended use of the product as laid down in the European Standard applied* *Level or class of the performance declared*

Figure ZA.1 — Example CE marking information of products under AVCP system 3

CE	*CE marking, consisting of the "CE"-symbol*
AnyCo Ltd, PO Box 21, B-1050, Brussels, Belgium **16** 00001-CPR-2015/05/12	*name and the registered address of the manufacturer, or identifying mark* *Last two digits of the year in which the marking was first affixed* *Reference number of the DoP*
EN 13160–4:2016 Class III **for the detection of the presence of liquid in interstitial spaces, leakage containments or monitoring wells** **Detection of: Presence of liquid** Software: Version X Durability of effectiveness against temperature: Type 1 Durability of effectiveness against chemical attack: Water	*No. of European Standard applied, as referenced in OJEU* *Unique identification code of the product-type* *Intended use of the product as laid down in the European Standard applied* *Level or class of the performance declared*

Figure ZA.2 — Example CE marking information of products under AVCP system 4

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