kiwa
Partner for progress

BRL-K636/03
2007-12-07

Evaluation Guideline

Kiwa product certificate for
Overfill prevention devices for storage tanks for liquid petroleum fuels

BRL-K636/03
2007-12-07

Evaluation Guideline

Kiwa product certificate for
Overfill prevention devices for storage tanks for liquid petroleum fuels

Validation
This Evaluation Guideline replaces BRL-K636/02

Binding declaration
This Evaluation Guideline was declared binding by the Board of Experts "Tanks, Tankinstallaties en Appendages" as per 7 December 2007

Kiwa N.V.
Certification and Inspection
Sir W. Churchill-laan 273
P.O. Box 70
2280 AB RIJSWIJK ZH
The Netherlands

Tel. +31 88 998 44 00
E-mail info@kiwa.nl
www.kiwa.nl

Amendment to BRL K636/03
Overfill prevention devices for storage tanks for liquid petroleum fuels

Date of amendment: August 1st, 2015

Technology code: Tank installations and appendages

Validated by BoE "Tanks, Tank installations & Appendages" on 01 September 2015

Validity
This amendment sheet pertains to BRL-K636/03 dated 07 December 2007.

Validation
This amendment sheet has been validated by Kiwa per 01 September 2015.

1.1 General
Revise the text in paragraph 1.1 of amendment dated 2 July 2010 to read:
For the performance of its certification work, Kiwa is bound to the requirements concerning the agreements on the implementation of certification as detailed in the NEN-EN-ISO/IEC 17065.

1.7 Acceptance of test reports provided by the supplier
Add paragraph to chapter 1 introduction to read:
Should the manufacturer submit reports from test Institutions or laboratories in order to demonstrate compliance of the product with the requirements of this evaluation guideline, that institute or laboratory shall comply with the applicable accreditation standards, i.e.:

- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17020 for inspection bodies;
- NEN-EN-ISO/IEC 17065 for certification bodies certifying products;
- NEN-EN-ISO/IEC 17021 for certification bodies certifying systems;
- NEN-EN-ISO/IEC 17024 for certification bodies certifying persons.

7.2 Certification personnel
Revise the text as follows:

- **Certification assessor / Application reviewer**: they are in charge of carrying out the pre-certification tests and assessing the site assessors' reports;
- **Site assessor**: they are in charge of carrying out external inspections at the supplier's works;
- **Decision-makers**: they are in charge of taking decisions in connection with the pre-certification tests carried out, continuing the certification in connection with the inspections carried out and taking decisions on the need to take corrective actions.

Amendment to BRL K636/03
Overfill prevention devices for storage tanks for liquid petroleum fuels

Date of amendment: August 1st, 2015

Technology code: Tank installations and appendages

Validated by BoE "Tanks, Tank installations & Appendages" on 01 September 2015

7.2 Qualification requirements

Revise Table in paragraph 7.2 to read:

	Certification assessor / Application reviewer	Site assessor	Decision maker
Basic competence			
• Knowledge and competent assessment of the production processes	• Technical education at Bachelor level or higher • 1 year of relevant working experience	• Technical vocational education at intermediate level or higher • 1 year of relevant working experience	• Technical education at Bachelor level or higher • 5 years of working experience with a minimum of 1 year experience with certification
• Audit skills	• Not applicable	• Training in audit skills • Minimum of 4 complete audits of which at least 1 has been has been carried out independently and witnessed for qualification	• Not applicable
Technical competence			
Knowledge of this BRL	• Detailed knowledge of this BRL • A minimum of 4 complete audits for this BRL or for related BRL's	• Detailed knowledge of this BRL • A minimum of 4 complete audits for this BRL or for related BRL's	• Not applicable
Relevant knowledge of: • The technology related to the manufacturing of the products to be inspected, the performance of these processes and the provision of these services • The manner in which the products are used, the processes are performed and the services are provided • Any defect which may occur during the use of the product, any error in the execution of processes and any inadequacies in the provision of services	• Relevant technical education at Bachelor level or higher • Specific courses and training (knowledge and skills)	• Relevant technical vocational education at intermediate level or higher • Specific courses and training (knowledge and skills)	• Not applicable

Certification personnel shall be qualified by assessing the knowledge and skills on the above mentioned requirements. The responsibility for the qualification is determined by the management of the certification body.

Amendment sheet BRL-K636/03
Overfill prevention devices for storage tanks for liquid petroleum fuels

Date of ammendment 2 July 2010
Technoloy code Tank installations and appendages
Validated by Board of experts "Tanks, Tanksinstallaties en Appendages" date 2 July 2010

Validity
This amendment sheet pertains to BRL-K636/03 dated 07 December 2007.
Reissue of product certificates based on BRL-K636/03 is not necessary.

Binding declaration
This amendment sheet was declared binding as per 2 July 2010.

Preface
This amendment sheet made to fulfill the requirements of compliance assessment from ISO/IEC 17000. These requirements are defined in document T33 of the Dutch Accreditation Council. For this guideline it concerns a reference to EN-45011, a description of the way how findings are weight and appraised and sanctions for incorrect use of the certification mark

§1.1 General

Text last paragraph to replace as follows:

During the performance of the certification work, Kiwa is bound to the requirements as stated in NEN-EN 45011 and as laid down in the chapter "Agreements on the implementation of certification".

§2.3 The Certification mark

Added to the text:

See Kiwa Regulations for Product Certification for requirements and clauses for incorrect use of the certification mark.

§6.1 Test and audit matrix

Table test and audit matrix to replace as follows:

Requirement	Guideline article	Article EN 13616	Category (see note)	Test + audits within the scope of the Guideline		
				Type test/initial evaluation	Supervision by Kiwa after granting the certificate	
					Audtis	Frequency
Product requirements						
Level L1	3.1.1	4.1.1	1	Yes	Yes	1 x 1year
Emptying delivery hose and delivery pipe	3.2.1	4.1.2	1	Yes	Yes	1 x 1year
Final closure, level L2	3.1.3	4.1.3/5.4	1	Yes	Yes	1 x 1year
Flow rate	3.1.4	4.1.4/5.2	2	Yes		
Auxiliary energy source	3.1.5	4.1.5/5.5.1	2	Yes	Yes	1 x 1year
Pressure	3.1.6	4.1.6/5.3	2	Yes	Yes	1 x 1year
Response time	3.1.7		2	Yes		
Construction						
Temperature	3.2.1	4.2.1/5.5.1	2	Yes		
Conductivity	3.2.2	4.2.2/5.4	2	Yes		
Durability	3.2.3	4.2.3	2	Yes		
Resistance against pressure	3.2.4	4.2.4	2	Yes		
Vapour tight	3.2.5	4.2.5	2	Yes		
Chemical suitability	3.2.6	5.5.2	2	Yes		
Resistance against corrosion	3.2.7		2	Yes		
Connections	3.2.8		2	Yes		
Function tester	3.2.9		2	Yes		
Avoidance or reduction of ignition sources						
Construction and form	3.3.1	4.3.1	1	Yes		
Electrical equipment	3.3.2	4.3.2	1	Yes		
Non-electrical equipment	3.3.3	4.3.3	1	Yes		
Marks	3.4	5.7.1	1	Yes	Yes	1 x 1year

Amendment sheet BRL-K636/03
Overfill prevention devices for storage tanks for liquid petroleum fuels

Date of ammendment 2 July 2010
Technoloy code Tank installations and appendages
Validated by Board of experts “Tanks, Tanksinstallaties en Appendages” date 2 July 2010

Identification plate	3.5	5.7.2	1	Yes	Yes	1 x 1year
Installation and user instructions	3.6		2	Yes	Yes	1 x 1year
Test methods						
Test rig	4.1		2	Yes	Yes	1 x 1year
Function test	4.2	5.5.4	1	Yes	Yes	1 x 1year, all models
Type test	4.3	5.5.2	2	Yes		
Requirements to be met by the quality system						
General	5.1		2	Yes	Yes	1 x 1year
Manager of the quality system	5.2		2	Yes	Yes	1 x 1year
FPC and IQC-scheme	5.3		2	Yes	Yes	1 x 1year
Procedures and working instructions	5.4		2	Yes	Yes	1 x 1year
Other requirements	5.5		2	Yes	Yes	1 x 1year

Note:
Non-conformities can be reported during the surveillance audits. These non-conformities can be classified into the following categories:

1 = Critical: These non-conformities can lead to a dangerous situation or result in a substandard product. The manufacturer shall, after approval from the certification body, implement corrective actions to rectify the situation within a maximum period of 2 weeks. Failure to do so shall result in the withdrawal of the certificate.

2 = Important: These non-conformities can in the long term lead to a substandard product. The manufacturer shall, after approval from the certification body, implement corrective actions to rectify the situation within a maximum period of 3 months. Failure to do so shall result in the withdrawal of the certificate.

3 = Less important: These non-conformities are less important but shall be rectified within a reasonable amount of time. The certification body shall check the corrective action taken during the following surveillance audit.

During the initial evaluation of the product, type tests have to be performed to determine whether the product meets the specified performance and product requirements. The requirements that shall be fulfilled in order to qualify for certification are stated in the above matrix. In the event of a change of the raw material or the supplier thereof the type tests shall be repeated by the tank manufacturer.

The quality system of the manufacturer is also audited during the initial evaluation.

After certification Kiwa shall periodically audit the manufacturer for compliance with this Evaluation Guideline. During these audits a periodic repetition of some of type tests can also be required.

Preface

Kiwa's Board of Experts "Tank, Tankinstallaties en Appendages" (Tanks, Tank installations and Appendages), in which the parties interested in the area of tanks, tank installations and tank appendages, approved this Evaluation Guideline. A working committee reporting to the board of experts has prepared this Evaluation Guideline.
In this working committee are represented manufacturers, installers and users of tanks.
The Board of Experts also guides the process of certification and may adjust this Evaluation Guideline where necessary. Wherever the term 'Board of Experts' is used in this Evaluation Guideline, the above-mentioned Board of Experts is meant.

Kiwa will use this Evaluation Guideline in conjunction with the Kiwa Regulations for Product Certification, in which the general rules used by Kiwa in the event of certification are recorded.

Information about public requirements and test methods from European regulations is given in chapter 2 of this guideline.

Content

1 Introduction

1.1 General

The requirements included in this Evaluation Guideline are used by Kiwa when handling an application and maintaining a product certificate for "Overfill prevention devices for storage tanks for liquid petroleum fuels".

This Evaluation Guideline replaces BRL-K636/02 "Overvulbeveiligingen voor opslaginstallaties voor vloeibare aardolieproducten" dated 1992-04-09.
Product certificate based on BRL-K636/02 lost there validation on 7 December 2008.

This Evaluation Guideline is based on the European Standard hEN 13616 "Overfill prevention devices for static tanks for liquid petroleum fuels". Requirements in this Evaluation Guideline have a cross-reference to the articles of the hEN 13616:2004. Some requirements in this Evaluation Guideline are additional or different to the hEN 13616.

Note: Installation of an overfill prevention device is only possible according the requirements mentioned in Evaluation Guideline BRL-K903 "Regeling Erkenning Installateurs Tankinstallaties (REIT)", (regulations for certified tank installation companies).

In performing certification work Kiwa is bound by the requirements set out in chapter 7 "Agreement on the performance of certification".

1.2 Field of application/scope

The overfill prevention devices are designed to be used as protective devices of storage installations for liquid petroleum products, in which the liquid supply to the storage installation is automatically stopped, when the maximum filling level is reached. The overfill prevention devices can be used in under ground or above ground storage tanks, manufactured from steel or plastic. The maximum height of above ground tanks is 5 m.
The requirements apply to overfill prevention devices suitable for use at ambient temperatures in the range from -25°C to +60°C. Addition measures may be required for use at temperatures outside this range and are subject of negotiation between the manufacturer and its client.

Two filling processes can be distinguished for which an overfill prevention device can be used, namely:

1. filling by gravity;
2. forced (pump) filling.

The maximum static pressure for forced filling is 800 kPa.

In the Evaluation Guideline the classification for overfill prevention devices is the same as used in the hEN 13616. Only overfill prevention devices in which the operation does not depend on the road tank vehicle or supply system (hEN 13616 Type A) are allowed. Two subtypes for overfill preventions devices are defined for Type A:

- Overfill prevention device by gravity fill only; Subtype A1;
- Overfill prevention device by gravity or pump fill: Subtype A2.

Overfill prevention devices which only function by the use of forced (pump) filling are also classified as subtype A2, and have an extra remark.

Note: The Dutch regulations for storage of liquid petroleum fuels (PGS 28 and PGS 30) prohibits forced filling in case of extremely highly flammable (K0), highly flammable (K1) and flammable liquids (K2). In case of combustible liquids (K3 flashpoint at or above 55°C) forced filling is allowed.

1.3 CE-marking

In relation with European Construction Products Directive (CPD89/016/EEC) CE-marking is possible, see hEN 13616 Annex ZA, ZB and ZC. CE marking in accordance with hEN 13616.

1.4 Terminology

Within this Evaluation Guideline the following terms and definitions apply:

- Board of Experts: The Board of Experts "Tank, Tankinstallaties en Appendages" (Tank, Tank installations and Appendages);
- Evaluation Guideline: The agreements made by the Board of Experts on the subject of certification;
- Electronic overfill prevention device system: System with a sensor mounted inside a storage tank, and controller which controls a valve in filling line;
- Factory production control: Quality inspections carried out by the supplier or manufacturer as part of their quality system;
- Forced filling: Filling under pressure, mostly with the application of pump;
- Filling level: The extend to which the tank can be filled, expressed in a percentage of the nominal contents of the storage tank;
- Gravity filling: Filling process without the application of a pump; in this process the filling pressure depends on the difference in height between the liquid levels of the storage installation and the road tank vehicle;
- IQC-scheme: Internal Quality Control-scheme;
- Maximum filling level: permitted filling level authorized by the local safety regulations;
- K0: Extremely highly flammable, flashpoint below 0°C;
- K1: Highly flammable, flashpoint between 0 and 21°C;
- K2: Flammable, flashpoint between 21 and 55°C;
- K3: Combustible, flashpoint at or above 55°C;
- Leak rate: Permitted rate of liquid allowed to pass through the overfill prevention after final closure;
- Level L1: Level at which the overfill prevention device stops or severely restricts the liquid delivery. This level is set such that, if emptying of the vehicle delivery hose and delivery pipe occurs, level L2 is not exceeded;
- Level L2: Level at which the overfill prevention device prevents any further product, apart from a permissible leak rate, entering the storage tank at, or prior to, the maximum filling level;
- Liquid-tight: Leaving no possibility for liquid to get outside the storage installation.
- Overfill prevention device: Device forming part of a supply system which automatically prevents the liquid level in the storage tanks exceeding a maximum filling level;
- Supplier: The party responsible for ensuring that products meet and continue to meet the requirements on which certification is based;
- Supply system: Connection hose, fittings and any fixed pipe work through which the liquid is delivered to the storage tank from the road tank vehicle;
- Road tank vehicle: Any mobile tank carrying liquids intended for discharging into a static storage tank;
- Vapour tight overfill prevention device: Device which does not permit vapour to pass from the ullage space through the device in normal operation;
- Qualified personnel: This could be personnel of certified installation firms according BRL-K903 or personnel working for the supplier of the overfill prevention device.

1.5 Acceptance of test reports supplied by the supplier

The acceptance of test reports supplied by the supplier is specified in the Kiwa-regulations for product certification.

1.6 Product certificate

The model of this product certificate has been included in this Evaluation Guideline as addendum 1.

2 Essential requirements

This chapter contains the essential requirements and public requirements, which overfill prevention devices, have to fulfill in relation to their testing methods to establish conformity.

2.1 Essential requirements

The Evaluation Guideline includes requirements and test methods as follows:

2.1.1 Requirements

Product requirements: performance requirements defined by measures or values, focusing on (identifiable) characteristics of products and setting a limiting value to be achieved, which can be determined. See chapter 3.

2.1.2 Test methods

Pre-certification type test and audits: initial type testing of products and audits of the factory production control and quality scheme in order to ascertain that all the requirements recorded in the Evaluation Guideline are met. See chapter 4.
Certification auditing: evaluations carried out after the certificate has been granted in order to ascertain whether the certified products continue to meet the requirements recorded in the Evaluation Guideline. See chapter 5.

The test and audit matrix in chapter 6 contains a summary showing the tests which must be carried out by Kiwa in the pre-certification stage and in the subsequent inspections. Is also shows the frequency with which audit test shall be carried out.

2.2 Public requirements

This paragraph contains directions to public requirements set up by law for this product. Requirements in standards and guidelines mentioned in this case are related to these public requirements.
These concern:

- Requirements related to Annex ZA of EN 13616;
- Requirements related to Annex ZB of EN 13616;
- Requirements related to Annex ZC of EN 13616;

2.2.1 Equipment and Protective Systems intended for the use in potentially explosive atmospheres Directive(hEN 13616 Annex ZA)

Essential requirements of Directive (ATEX) 94/9/EC – Equipment and protective systems intended for use in potentially explosive atmospheres – Annex II, in accordance with table ZA.1 of EN 13616: 2004.

Note: Annex ZA is modified in January 2006, see corrigendum of EN 13616.

2.2.2 Electromagnetic Compatibility Directive (hEN 13616 Annex ZB)

According to hEN 13616 Annex ZB, there are no essential requirements of the Electromagnetic Compatibility Directive (EMC) 89/336/EEC applicable for overfill prevention devices type A.

2.2.3 Construction Products Directive(hEN 13616 Annex ZC)

The following table, according to hEN 13616 Annex ZC, contains an overview of essential requirements, which these products have to fulfill in relation the Construction Product Directive (CPD) 89/106/EEC.

Essential Characteristics	Requirement Clauses
Effectiveness of the overfill prevention devices	BRL-K636/03 § 3.1
Durability of effectiveness against temperature, chemical attack, fatigue an cycling	BRL-K636/03 § 3.1, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 4.3.2 and 4.3.4(*) (*) BRL-K636/03 has an cycle of 5000

2.3 The Certification mark

Method of marking on the certified overfill prevention device as follows:
Non-erasable on the body of overfill prevention device, or not removable part of the overfill prevention device, or plate mounted on the overfill prevention device providing the compulsory specifications mentioned in 3.4.

3 Product requirements

This chapter contains the essential requirements, which products have to fulfil.

3.1 Functional criteria (hEN 13616 § 4.1)

3.1.1 Level L1 (hEN 13616 § 4.1.1)

On filling the storage tank to a level L1, at this level, a complete and automatic closure or automatic sever restriction of the flow shall be effected.
This level is set such that, if emptying of the vehicle delivery hose and the delivery pipe occurs, level L2 is not exceeded.

Note: The difference between level L1 and level L2 is based on an average length of 12 meters delivery hose, and 18 meters delivery pipe, both 3", draining in a tank of 10.000 l.

3.1.2 Emptying delivery hose and delivery pipe(hEN 13616 § 4.1.2)

After initial closure, if provided, the contents of the delivery hose and preferably the delivery pipe shall be emptied into the storage tank.
Information about a specific action necessary to start emptying the delivery hose and delivery pipe shall be written on the identification plate.
After reaching level L1 the contents of the vehicle delivery hose and delivery pipe shall be emptied by a minimum flow rate of 25 l/h.
For an electronic overfill prevention device system the time for opening the valve and emptying the delivery hose and delivery pipe is set by qualified personnel.

Note: The content which has to be emptied into the storage tank depends on the volume (length and diameter) of the vehicle delivery hose and delivery pipe. It is recommended keeping the vehicle delivery hose and delivery pipe as short as possible, but always in accordance with the rules for installation of tanks and safety instructions for filling.

3.1.3 Final clossure, level L2 (hEN 13616 § 4.1.3 and § 5.4)

Final automatic closure shall occur once level L2 has been reached (final closure may be achieved at level L1). At level L2, no further liquid other than the allowable leak rate shall enter the tank.
The device shall not have a leak flow rate greater than 150 l/h after closure at operational pressure.

Subtype A1: Overfill prevention device by gravity fill only

- Maximum flow rate of 150 l/h at a pressure of 15 kPa.

Subtype A2: Overfill prevention device by gravity or pump fill

- Maximum flow rate of 150 l/h at a pressure of 450 kPa.

3.1.4 Flow rate (hEN 13616 § 4.1.4 and 5.2)

The performance of the overfill prevention device shall not be adversely affected by the flow rate taking into account the following:

a. the liquid level in the storage tank before and during delivery; or
b. the level of liquid in the road tank vehicle or supply system before and during delivery.

Minimum and maximum linear velocity should be in accordance with:
Subtype A1: Overfill prevention device by gravity fill only

- The overfill prevention device shall work at 0,2 m/s minimum linear velocity and 15 kPa static pressure after closure.
- The overfill prevention device shall work at 3,0 m/s maximum linear velocity and 200 kPa static pressure after closure.

Subtype A2: Overfill prevention device by gravity or pump fill

- The overfill prevention device shall work at 0,2 m/s minimum linear velocity and 15 kPa static pressure after closure.
- The overfill prevention device shall work at 3,0 m/s maximum linear velocity and 400 kPa or 800 kPa static pressure after closure.

See table 3.1 for relation diameter and flow rate.

Diameter		Minimum flow rate (m^3/h)	Maximum flow rate (m^3/h)	Tolerance %
2″	DN 50	1,4	21	± 5%
2.5″	DN 65	2,4	36	± 5%
3″	DN 80	3,6	54	± 5%
4″	DN 100	5,6	84	± 5%

Table 3.1 Diameter and flow rate

Declare other maximum linear velocity and static pressure after closure is possible within the above mentioned range, in consideration with the certification body.

3.1.5 Auxillary energy source (hEN 13616 § 4.1.5 and § 5.5.1)

Where the overfill prevention device requires an auxiliary energy source, the filling process shall not commence or shall automatically stop in the event of failure of that energy source.
By a failure of the energy source the overfill prevention device closes at level L2.
If the overfill prevention device is closed due to a failure in the energy source or any defect whatsoever, it shall be impossible to start or restart the filling process. In this case the overfill prevention device has to be reset.
In the cause of energy failure during emptying the filling hose and filling line a procedure should be available.
The overfill prevention device is secured, in such a way that only qualified personnel can reset the overfill prevention device.

3.1.6 Pressure (hEN 13616 § 4.1.6 and § 5.3)

The operation of the overfill prevention device shall not generate pressure in excess of the designed criteria for the supply system.

Overfill prevention devices by gravity fill *(hEN 13616 § 5.3.1)*

- Any pressure surge created by the overfill prevention device at closure exceeding 300 kPa shall not exceed a period of more than 10 ms.

Overfill prevention devices by gravity or pump fill *(hEN 13616 § 5.3.2)*

- By filling with a pump with a performance of 400 kPa any pressure surge created by the overfill prevention device at closure exceeding 600 kPa shall not exceed a period of more than 10 ms.
- By filling with a pump with a performance of 800 kPa any pressure surge created by the overfill prevention device at closure exceeding 1200 kPa shall not exceed a period of more than 10 ms.

The measurement equipment for pressure surge shall have a minimum measuring frequency 1000 Hz.

Note: The owner or user is responsible for the maximum pressure of the supply system in relation with the pressure after closure of the overfill prevention device.

3.1.7 Response time

In the total response time of an electronic overfill prevention device system, no more than 75 liters may enter the tank after detection by the sensor.

Note: Limitation of the flow of an electronic overfill prevention device can be made by reducing the maximum velocity or diameter of the delivery pipe and delivery hose.

3.2 Construction

3.2.1 Temperature (hEN 13616 § 4.2.1 and § 5.5.1)

All construction materials shall be compatible with the temperature range of -25 °C to 60 °C and with the liquid and its vapour phase being stored. The manufacturer shall compile a list of all components and shall supply specifications to demonstrate that these components will not be adversely affected in the temperature range of -25 °C to 60 °C.

3.2.2 Conductivity (hEN 13616 § 4.2.2 and § 5.4)

When the overfill prevention device forms a part of an earth continuity path it shall be conductive. An overfill prevention device shall be conductive with a resistance value not greater than 1 M Ohm.

Note: Overfill prevention device must be conductive to dissipate static charge generated while fuel (extremely highly flammable, highly flammable and flammable liquids) is being dispensed. Conductivity of the overfill prevention device is recommend by dispensing combustible liquids.

3.2.3 Durability (hEN 13616 § 4.2.3)

The overfill prevention device shall be of a durable construction. Durability shall be tested in accordance with 4.3.4.
The cycle of this test is set on 5000.

Note: Cycle of 5000 is the minimum number for overfill prevention device used in tank installations in the Netherlands, and does not change the nature of an overfill prevention device to a fill stop. Filling of storage tanks shall occur according filling instructions based on the maximum deposit of fuel by measurement before the start of filling the storage tank.

3.2.4 Resistance against pressure (hEN 13616 § 4.2.4)

All parts of the overfill prevention device situated either internally or externally on the tank shall withstand static negative and positive pressure test to comply with 4.3.2. Any resulted deformation shall not prevent the device fully functioning.

3.2.5 Vapour tight (hEN 13616 § 4.2.5)

The overfill prevention device shall prevent or severely restrict vapour flowing from the ullage space into the fill pipe.

Note: A non-vapour tight overfill prevention device could affect the functioning of a vapour recovery system. Vapour tight is only required for overfill prevention devices used in the storage tanks which are part of a vapour recovery system which created overpressure.

3.2.6 Chemical suitability (hEN 13616 § 5.5.2)

The complete overfill prevention device shall be resistant to petroleum fuels within the scope of this Evaluation Guideline.

Note: On demand of customer, a manufacturer can declare, and under the responsibility of the manufacturer, the chemical suitability for other liquids. A comparable test as in 4.3.1 is recommended.

3.2.7 Resistance against corrosion

The materials of components for assembling the overfill prevention device shall be resistant to internal and external corrosion. The liquid and vapours in the storage tank may not adversely affect

the process of corrosion. Different metals used in the overfill prevention device and steel storage tanks may not constitute corrosion elements.

Note: The effects of galvanic corrosion are influenced by the composition of the liquid.

3.2.8 Connections

The nominal dimensions of the connections of the overfill prevention device should comply with steel threaded and malleable pipe fittings according standards EN 10241 and EN 10242. The pipe thread shall be in compliance with ISO 7-1 for pipe threads where pressure-tight joints are made on the threads or ISO 228-1 for pipe threads where pressure-tight joints are not made on the threads.

3.2.9 Function tester

The overfill prevention device may be equipped with a function tester or device that checks the functioning. Neither the presence nor the use of this checking device may affect the proper functioning of the overfill prevention device.

3.3 Avoidance or reduction of ignition sources

3.3.1 Construction and form (hEN 13616 § 4.3.1)

All electrical and non-electrical equipment and components, intended for use in potentially explosive atmospheres, shall be designed and constructed according to good engineering practice and in conformity to the required categories for group II equipment to ensure avoidance of any ignition source. To classify the category of the equipment it shall be subjected to an ignition hazard assessment in accordance with 5.2 of EN 13463-1:2001.

The standard EN 1127-1 specifies the methods for the identification of hazardous situations that may lead to an explosion. Information on the control and classification of hazardous places for gases and vapours by the use of ventilation is given in EN 60079-10.

3.3.2 Electrical equipment (hEN 13616 § 4.3.2)

Any electrical equipment, intended for use in potentially explosive atmospheres, shall comply with the requirements according to EN 50014 and where relevant, the European Standard for the specific type of ignition protection selected, see table 3.3.

Protection Technique	**Symbol**	**Standard**	**Zone**		
			0	**1**	**2**
Intrinsic safety	ia	EN 50020	A	A	A
Intrinsic safety	ib	EN 50020	-	A	A
Flameproof	d	EN 50018	-	A	A
Increased safety	e	EN 50019	-	A	A
Oil immersion	o	EN 50015	-	A	A
Pressurized apparatus	p	EN 50016	-	A	A
Powder filling	q	EN 50017	-	A	A
Encapsulation	m	EN 50028	-	A	A
Non sparking	n	EN 50021	-	-	A
Intrinsically safe electrical systems	i	EN 50039	A	A	A
General requirements for Category 1 equipment	-	EN 50284	A	-	-
General requirements	-	EN 50014	A	A	A
A = allowed					

Table 3.3 Standard protection concepts allowed

3.3.3 Non-electrical equipment(hEN 13616 § 4.3.3)

Any non-electrical equipment, intended for use in potentially explosive atmospheres shall comply with the requirements of EN 13463-1 and, where relevant, the European Standard for the specific type of ignition protection selected.

3.4 Marks (hEN 13616 § 5.7.1)

The overfill prevention device shall be marked with the following information:

- Manufacturer's name or mark;
- type and subtype;
- maximum static pressure;
- mandatory markings CE and Ex;
- manufacturing number and year;
- the Kiwa-mark;
- EN 13616;
- vapour tight (yes/no);
- temperature range, if it is outside the temperature range of -25°C to +60°C;
- maximum flow rate, if the linear velocity is less than 3,0 m/s (see table 3.1 for flow rate in different pipe diameters).

3.5 Identification plate (hEN 13616 § 5.7.2)

The overfill prevention device shall be supplied with an instruction plate to be permanently fastened to the filling point. The instruction plate shall be weather proof. It shall contain the following information:

- manufacturer;
- type and subtype;
- maximum static pressure;
- the instructions should at least describe the actions necessary to empty the delivery hose and delivery pipe after closing the overfill prevention device;
- if forced (pump) filling is prohibited, the following prohibition shall be added: **"VERBODEN TE VULLEN DOOR MIDDEL VAN EEN POMP"**;
- if only (pump) forced filling is allowed, the following prohibition shall be added: **"VULLEN DOOR MIDDEL VAN VRIJE VAL NIET MOGELIJK"**;
- temperature range, if it is outside the temperature range of -25°C to +60°C;
- maximum flow rate, if the linear velocity is less than 3,0 m/s (see table in 3.1.4 for flow rate in different pipe diameters).

3.6 Installation and user instructions

The manufacturer shall supply proper written installation and user instructions in the Dutch language.

The following items are important for the installation and user instructions:

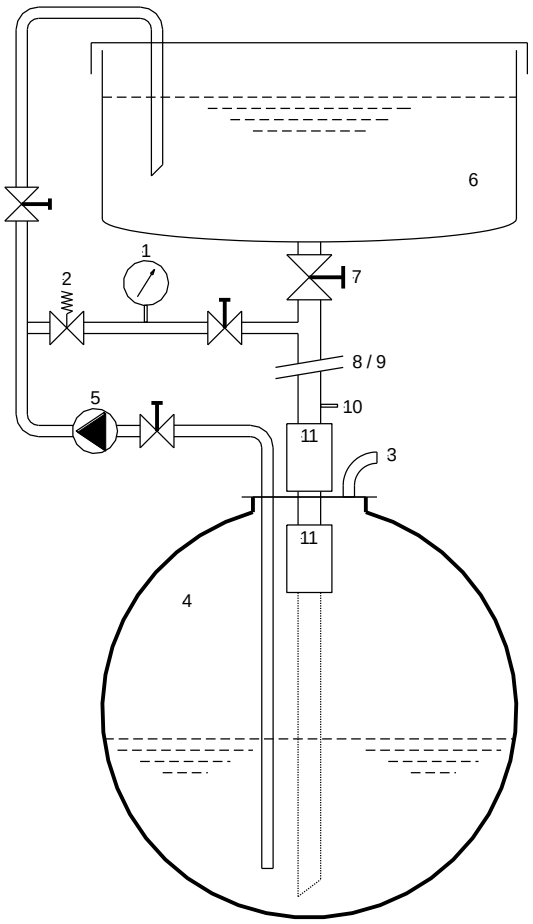
- reference to installation rules for the Netherlands;
- installation instructions;
- user instructions;
- warranty;
- qualifications for installation and maintenance personnel if required by electronic overfill prevention device systems.

4 Test methods

This chapter contains the test methods, which products have to fulfil.

4.1 Test rig

The overfill prevention device shall be mounted in accordance with the manufacturer's installation instructions in a test rig layout as shown in figure 4.1.
The test liquid can be water containing a corrosion preventing agent or a petroleum (test) liquid. For safety reasons a petroleum (test) liquid shall have a flashpoint of 55° C or more.



1 pressure gauge
2 pressure regulator
3 vent pipe (1/2 d fill pipe)
4 ullage space
5 pump
6 header tank
7 flow control valve
8 / 9 fill hose / pipe
10 surge pressure test point
11 overfill prevention device

Figure 4.1 Test rig layout

4.2 Function tests *(hEN 13616 § 5.5.4)*

Each overfill prevention device shall be tested in accordance 4.2.1, 4.2.2 and 4.2.3.

4.2.1 Level L1 closure test (hEN 13616 § 5.5.4.2)

The overfill prevention device shall be tested at the minimum and maximum permissible flow rate according to 3.1.4.
The maximum pressure surge shall not exceed that as specified in 3.1.6.
After initial level L1, closure test, the supply system shall be allowed to drain down according to manufacturer's instructions and verified to have occurred.

4.2.2 Level L2 closure test (hEN 13616 § 5.5.4.3)

Repeat the test according to 4.2.1 and on reaching level L1, adjust flow control valve within 1 min to provide the minimum flow rate as specified in 3.1.4 and check the overfill prevention device as fully closed at level L2.

4.2.3 Leak tightness after closure test (hEN 13616 § 5.5.4.4)

After closure at level L2, measure the leakage rate through the assembly within 1 min. This shall not exceed the value as specified in 3.1.3.

4.2.4 Pressure surge test (hEN 13616 § 5.5.4.5)

The maximum pressure surge generated at the pressure test point on closure of the overfill prevention device shall be measured and shall not exceed the requirements as specified in 3.1.6. This may be checked simultaneously with the flow closure tests according to 4.2.1 and 4.2.2.

The surge pressure shall be recorded at maximum flow rate in accordance with 4.2.1 and 3.1.6 using a pressure sensor located in the pipe work within 200 mm of the overfill prevention device.
The pressure sensor and its measuring system shall have a response time of 1 ms.

Surge test shall be carried out in accordance with figure 4.1 and the bore size of the hose shall be equal to the overfill prevention device size.

4.3 Type tests

A complete type approval exists of tests according 4.3.1, 4.3.2, 4.3.3, and 4.3.4, and if applicable 4.3.5 or 4.3.6. After these tests the overfill prevention device shall be retested for operation in accordance with 4.2.1, 4.2.2, 4.2.3 and 4.2.4.
The test results shall be recorded in a report.

4.3.1 Chemical suitability test (hEN 13616 § 5.5.2)

The complete overfill prevention device, or parts normally exposed to petroleum fuels or vapours, shall be subjected to a test cycle as below using the test liquid with the following composition:

- 41,5 % in volume of toluene;
- 41,5 % in volume of iso octane;
- 15 % in volume of methanol;
- 2 % in volume of iso butanol.

If parts of the device are subjected to contact with liquid or vapour, the overfill prevention device shall not be dissembled for this test. Non-contact parts may be protected simulating typical installation or protection by screening, jacketing, etc.

Test cycle consists of:

a. total immersion in test liquid for 24 h at (20 ± 1)^{o} C;
b. total immersion in saturated vapour or test liquid for 24 h at (20 ± 1)^{o} C;
c. total immersion in test liquid for 24 h at (20 ± 1)^{o} C;
d. 1 h drying at (20 ± 1)^{o} C.

After this test, the device shall be inspected and there shall be no signs of damage, distortion or obvious malfunction. The remaining type approval test shall then be carried out in sequence.

4.3.2 Pressure test (hEN 13616 § 5.5.3)

Where any part of overfill prevention device is designed to be installed inside of the tank, it shall be placed in a closed pressure vessel and subjected to an internal and then to an external pressure for (60 ±5) min. for each test. The overfill prevention device nor any components shall not suffer any damage during this test.

The equipment shall be subjected to the following pressures:

- negative pressure: 30 kPa;
- pressure: 100 kPa.

4.3.3 Mechanical strength (hEN 13616 § 5.5.4.6)

With the valve closed, maintain an internal to external pressure of 1,5 time the maximum static pressure according to 3.1.4 for (120 ± 10) s. There shall be no permanent deformation after visual examination. The device shall then be submitted to the endurance test.

4.3.4 Endurance test (hEN 13616 § 5.5.4.7)

Repeat test according to 4.2.1 a further 5000 times in sequence. Drain down and allow valve to reset after each test sequence is completed.

4.3.5 Vapour tight test

Determine if the overfill prevention device needs to be vapour tight.

4.3.5.1 Vapour tight test procedure (hEN 13616 § 5.5.4.8)

The overfill prevention device shall be installed in the test rig layout according to figure 4.1. The inlet and outlet of the line shall be closed. The line shall have a 3,5 kPa over-pressure applied. The pressure shall remain stable for 5 min at (3,5 ± 0,1) kPa. All joints shall be checked with a leak detection medium. No leaks shall be visible.

4.3.5.2 Non-vapour tight test procedure (hEN 13616 § 5.5.4.9)

The device shall be installed in the test rig layout according to figure 4.1. The inlet and the outlet shall be closed. The line shall have a 3,5 kPa over pressure applied. The volume of air (or liquid) shall be measured by meters over a 5 minute period and the results recorded.

A pipe of the same diameter with a 3 mm hole, replacing the overfill prevention device, shall be installed in the test rig. The line shall have a 3,5 kPa over pressure applied. The volume of air (or liquid) shall be measured over a 5 minute period and the results recorded. The device will be accepted if the volume recorded is equal or less than the volume recorded in the pipe with a 3 mm hole.

Note: A comparison pressure test with a blind pipe with a hole of 3 mm could be a way to demonstrate this requirement.

4.3.6 Continuity test (hEN 13616 § 5.5.4.10)

Measure the transition resistance through the body of the overfill prevention device with a driven potential of more than 500 V, capable of measuring 1 M Ohm to EN 60204-1 and record the transition resistance.

Record the continuity in Ohm to comply with 3.2.2.

5 Requirements to be met by the quality system

5.1 General

This chapter contains the requirements, which shall be met by the supplier's and/or manufacturer's quality system.

5.2 Manager of the quality system

Within the supplier's and/or manufacturer's organization structure an employee shall be responsible for managing the quality system.

5.3 Factory production control and schedule of internal quality control

The supplier and/or manufacturer shall have factory production control (FPC) and an internal quality control scheme (IQC-scheme) in operation. The intention of this schedule is to ensure that products meet and continue to meet the requirements on which certification is based.

The following shall be recorded in the IQC-scheme:

- inspections carried out by the producer;
- procedures for carrying out inspections;
- frequency of inspections;
- recording and maintaining inspection records.

At the time of the pre-certification, this quality system shall be functioning for at least 1 month. This IQC-scheme should correspond with the framework included in addendum 2.

5.4 Procedures and working instructions

The supplier shall be able to submit the following procedures:

- dealing with products with deviations;
- corrective actions to be taken if non-conformities are found;
- dealing with complaints about products and/or service delivered;
- the working instructions and inspection forms used.

Products with deviations:
The supplier and/or manufacturer shall have a procedure for products with deviations to prevent that products with deviations will be delivered.

Corrective actions:
The supplier and/or manufacturer shall have a procedure to work out corrective actions by non-conformities. The cause of the non-conformities shall be explored. Feedback to the concerning unit is required.

Complaints:
The supplier and/or manufacturer shall have a procedure for the handling of complaints of the supplied products. This procedure consists of:

- a documented procedure for the treatment of complaints;
- the company appoints someone responsible for the treatment of complaints;
- a registration of complaints is required;
- feedback, about the complaints, to the concerning units is required;
- the measures taken after complaints shall be documented.

5.5 Other requirements to be met by the quality system

Quality system:
When a supplier and/or manufacturer have of a quality system based on ISO 9001: 2000, it is possible to refer to procedures and instructions of this quality system.
Regulations for Product Certification:
The producer's quality system will be assessed. This assessment will include at least those aspects which are given in Article 3.3 of the Kiwa Regulations for Product Certification: 2004.
Changes:
The supplier and/or manufacturer shall inform Kiwa about changes which can affect the quality of the products. This could be change of the design, or changes in the production. Kiwa will determine whether extra inspections are necessary.
Working instructions and procedures:
The IQC-scheme can be supplemented with working instructions of importance and procedures used in the production process.
Documents and drawings:
Overfill prevention devices shall be produced on the base of validated documents and drawings. These documents are validated by a qualified person. Invalid documents and drawings shall be deleted directly. The retention time of documents is recorded.
Measurement and inspection equipment:
The supplier and/or manufacturer shall provide measurement and inspection equipment. These measurement and inspection equipment shall also be disposed to inspectors of Kiwa.

6 Summary of tests and audits

This chapter contains a summary of the following tests and audits to be carried out in the event of certification:

- type tests and certification audits;
- certification audits of the product requirements;
- certification audits of the quality system;

Frequency which Kiwa will carry out audits and test is also stated in the summary.

6.1 Test and audit matrix

Requirement	Guideline article	Article EN 13616	Test + audits within the scope of the Guideline		
			Type test + audits	Supervision by Kiwa after granting the certificate	
				Control	Frequency
Product requirements					
Level L1	3.1.1	4.1.1	X	X	1 x 1year
Emptying delivery hose and delivery pipe	3.2.1	4.1.2	X	X	1 x 1year
Final closure, level L2	3.1.3	4.1.3/5.4	X	X	1 x 1year
Flow rate	3.1.4	4.1.4/5.2	X		
Auxiliary energy source	3.1.5	4.1.5/5.5.1	X	X	1 x 1year
Pressure	3.1.6	4.1.6/5.3	X	X	1 x 1year
Response time	3.1.7		X		
Construction					
Temperature	3.2.1	4.2.1/5.5.1	X		
Conductivity	3.2.2	4.2.2/5.4	X		
Durability	3.2.3	4.2.3	X		
Resistance against pressure	3.2.4	4.2.4	X		
Vapour tight	3.2.5	4.2.5	X		
Chemical suitability	3.2.6	5.5.2	X		
Resistance against corrosion	3.2.7		X		
Connections	3.2.8		X		
Function tester	3.2.9		X		
Avoidance or reduction of ignition sources					
Construction and form	3.3.1	4.3.1	X		
Electrical equipment	3.3.2	4.3.2	X		
Non-electrical equipment	3.3.3	4.3.3	X		
Marks	3.4	5.7.1	X	X	1 x 1year
Identification plate	3.5	5.7.2	X	X	1 x 1year
Installation and user instructions	3.6		X	X	1 x 1year
Test methods					
Test rig	4.1		X	X	1 x 1year
Function test	4.2	5.5.4	X	X	1 x 1year, all models
Type test	4.3	5.5.2	X		
Requirements to be met by the quality system					
General	5.1		X	X	1 x 1year
Manager of the quality system	5.2		X	X	1 x 1year
FPC and IQC-scheme	5.3		X	X	1 x 1year
Procedures and working instructions	5.4		X	X	1 x 1year
Other requirements	5.5		X	X	1 x 1year

7 Agreements on the performance of certification

7.1 General

This chapter contains the agreement made by the Board of Experts on the performance of certification by Kiwa.

7.2 Certification staff

The staff involved in the certification may be sub-divided into:

- certification engineer: they are in charge of carrying out the pre-certification test and assessing the inspectors' reports;
- inspectors: they are in charge of carrying out external inspections at suppliers' works;
- decision-makers: they are in charge of taking decisions in connection with the pre-certification test carried out, continuing the certification in connection with the inspections carried out and taking decisions on the need to take corrective actions.

7.2.1 Qualification requirements

The Board of Experts has set the following qualification requirements for the subject matter of the Evaluation Guideline:

Certification staff	Level of education and training	Experience
Certification engineer	Higher-level professional technical education or equivalent by experience	2 years
Inspector	Middle-level professional technical education or equivalent by experience	2 years
Decision-maker	Higher-level professional technical education or equivalent by experience	2 years and management experience

7.3 Frequency of external audits

At the time this Evaluation Guideline has been taken in effect, the frequency was set at 1 visit per year.

7.4 Specific rules laid down by the Board of Experts

The Board of Experts has not laid down specific rules, which have to be observed by Kiwa when implementing the certification.

8 List of documents stated

8.1 Statutory regulations

8.2 Standards / normative documents

Number	Title
ATEX 94/9/EC	Equipment and Protective Systems intended for the use in potentially explosive atmospheres Directive.
ATEX 1999/92/EG	Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.
BRL-K903	Evaluation Guideline Kiwa product certificate for "Regeling Erkenning Installateurs Tankinstallaties (REIT)".
CPD 89/106/EEC	Construction Product Directive.
EMC 89/336/EEC	Electromagnetic Compatibility Directive.
EN 1127-1:1997	Explosive atmospheres – Explosion prevention and protection – Part 1: Basic Concepts and methodology.
EN 10241:2000	Steel threaded pipe fittings.
EN 10242:1994	Threaded pipe fitting in malleable cast iron.
EN 13463-1:2001	Non-electrical equipment for potentially explosive atmospheres – Part 1: Basic method and requirements.
EN 50014	Electrical apparatus for potentially explosive atmospheres. General requirements.
EN 60204-1	Safety of machinery – Electrical equipment of machinery – Part 1: General requirements.
EN-IEC 60079-10:2003	Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas.
hEN 13616:2004	Overfill prevention devices for static tanks for liquid petroleum fuels".
ISO 7-1	Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation.
ISO 228-1	Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation.
PGS 28	Publicatiereeks Gevaarlijke stoffen 28 "Vloeibare aardolieproducten – Afleverinstallaties en ondergrondse opslag" Remark: PGS 28 is an actualisation and combination of CPR 9-1 "Vloeibare aardolieproducten – Ondergrondse opslag en afleverinstallaties" and CPR 9-5 "Vloeibare aardolieproducten – Ondergrondse opslag van vloeibare producten in kunststof tanks".
PGS 30	Publicatiereeks Gevaarlijke stoffen 30 "Vloeibare aardolieproducten – Buitenopslag in kleine installaties" Remark: PGS 30 is the unchanged former CPR 9-6 "Vloeibare aardolieproducten – Opslag tot 150 m^3 van brandbare vloeistoffen met een vlampunt van 55° tot 100° C in bovengrondse tanks".

Certificate

Number	12345	Replaces	Addendum 1
Issued		Dated	

Product certificate

Overfill prevention devices for storage installations of liquid petroleum fuels

Based on pre-certification tests as well as periodic inspections by Kiwa, the products referred to in this certificate and marked with the Kiwa-mark as indicated under 'Marking', supplied by

Supplier/manufacturer

may, on delivery, be relied upon to comply with the Kiwa evaluation guideline BRL-K-636 dated 07-12-2007 “Overfill prevention devices for storage installations of liquid petroleum fuels” and amendment sheets if applicable.

ing. B. Meekma
Director Certification and Inspection, Kiwa N.V.

This certificate is issued in accordance with the Kiwa-Regulations for Product certification.

This certificate consist of 2 pages.
Publication of the certificate is allowed.

Company

Kiwa N.V.
Certification and Inspection
Sir W. Churchill-laan 273
P.O. Box 70
2280 AB RIJSWIJK ZH
The Netherlands
Tel. +31 70 414 44 00
Fax +31 70 414 44 20
E-mail certif@kiwa.nl
www.kiwa.nl

Overfill prevention devices for storage installations of liquid petroleum fuels

PRODUCT SPECIFICATION

Type, subtype (restrictions to pressure use in underground or above ground tanks, vapour tight (yes/no) etc.)

APPLICATION AND USE

Overfill prevention devices are designed to prevent contamination of the environment, due to overfilling of the storage tank.

MARKING

The products are marked with the Kiwa-mark

Place of the mark:
On the body of overfill prevention device, or not removable part of the overfill prevention device, or plate mounted on the overfill prevention device

Compulsory specifications:
- manufacturer's name or mark;
- type and subtype;
- maximum static pressure;
- mandatory markings CE and Ex;
- manufacturing number and year;
- Kiwa-mark;
- EN 13616;
- vapour tight (yes/no);
- temperature range, if it is outside the temperature range of -25ºC to +60ºC;
- maximum flow rate, if the linear velocity is less than 3,0 m/s.

Method of marking:
Non-erasable;

RECOMMENDATIONS FOR CUSTOMERS:

1. Check at the time of delivery whether:
   1.1 the producer has delivery in accordance with the agreement;
   1.2 the mark and the marking method are correct;
   1.3 the products show no visible defects as a result of transport etc.

2. If you should reject a product on the basis of the above, please contact:
   2.1 <<company>>
   and, if necessary,
   2.2 Kiwa N.V.

3. Consult the producer's processing guidelines for the proper storage and transport methods.

4. Check whether this certificate is still valid by consulting www.kiwa.nl

Addendum 2

Model IQC-scheme

Inspection subjects	Aspects of inspection	Inspection method	Inspection frequency	Registration method
Raw materials or materials supplied: • receipts • incoming goods inspection raw materials				
Production process, production equipment, plant: • procedures • working instructions • equipment • plant				
Finished products				
Measuring and testing equipment: • measuring means • calibration • test equipment				
Logistics • internal transport • storage • packaging • preservation • identification or marking of semi-manufactures end products				