

COMMENTS BEFORE FEBRUARY 6th, 2014

BRL-K580/02

Draft

2014-12-01

Evaluation Guideline

for the Kiwa product certificate for tanks made from blow moulded polyethylene (PE), with an integrated steel spill container, for the stationary or mobile storage of liquid fuels, heating oil, waste oil and lubricants





Preface

This evaluation guideline has been accepted by the Kiwa Board of Experts “Tanks, Tank installations & Appendages”, wherein all the relevant parties in the field of fuel and oil storage tanks, tank installations and tank appendages are represented. This Board of Experts also supervises the certification activities and where necessary require the evaluation guideline to be revised. All references to Board of Experts in this evaluation guideline pertain to the above mentioned Board of Experts.

This evaluation guideline will be used by Kiwa in conjunction with the Kiwa-Regulations for Product Certification. This regulation details the method employed by Kiwa for conducting the necessary investigations prior to issuing the product certificate and the method of external control.

Kiwa Nederland B.V.

Sir Winston Churchill-laan 273
P.O. Box 70
2280 AB RIJSWIJK
The Netherlands

Tel. +31 70 414 44 00
Fax +31 70 414 44 20
info@kiwa.nl
www.kiwa.nl

© 2015 Kiwa N.V.

All rights reserved. No part of this report may be reproduced, stored in a database or retrieval system, or published, in any form or in any way, electronically, mechanically, by print, photoprint, microfilm or any other means without prior written permission from the publisher.

The use of this evaluation guideline by third parties, for any purpose whatsoever, is only allowed after a written agreement is made with Kiwa to this end.

Validation

This evaluation guideline has been validated by the Director Certification and Inspection of Kiwa on

Date



Table of Contents

1	Introduction	6
1.1	General	6
1.2	Field of application / scope	6
1.3	CE-marking	6
1.4	Acceptance of test reports provided by the supplier	7
1.5	Quality declaration	7
2	Terminology	8
3	Terms and definitions	9
4	Legal requirements	10
4.1	General	10
4.2	Legal requirements	10
4.2.1	Dutch legislation	10
4.3	Public requirements	10
4.3.1	Products with CE marking according to the Construction Products Regulations	10
4.3.2	Requirements relating to dangerous substances	11
5	Procedure for granting the quality declaration	12
5.1	Pre certification tests	12
5.2	Granting the quality declaration	12
6	Requirements and test methods	13
6.1	General	13
6.2	Design drawings and calculations	13
6.3	Requirements and test methods of PE material characteristics	14
6.3.1	Manufacturing process	14
6.3.2	Materials used	14
6.3.3	Density	14
6.3.4	Melt Mass-flow rate	14
6.3.5	Tensile strength and elongation at yield	14
6.3.6	Melt temperature	14
6.3.7	Dangerous substances	14
6.3.8	Resistance to the stored medium of the base material used	14
6.3.9	Resistance against UV-ageing	15
6.3.10	Reaction to fire	15
6.3.11	Electrostatic behaviour	16
6.4	Requirements and test methods of steel material characteristics	16
6.4.1	Material used	16
6.4.2	Corrosion protection	16
6.5	Requirements and test methods of the PE tank	16
6.5.1	Visual inspection / appearance	16
6.5.2	Mass of tank	16
6.5.3	Wall thickness	16
6.5.4	Resistance to impact	17



6.5.5	Resistance to pressure (type test)	17
6.5.6	Leak tightness (production test)	17
6.5.7	Elongation	17
6.5.8	Deformation	17
6.5.9	Resistance against heat effects	17
6.6	Requirements and test methods of the steel spill container	17
6.6.1	Visual inspection / appearance	17
6.6.2	Wall thickness	17
6.6.3	Nominal capacity	18
6.6.4	Construction of the spill container	18
6.6.5	Construction of the spill container cover	18
6.6.6	Construction of the spill container bottom	18
6.6.7	Fabrication of spill container	18
6.6.8	Lifting lugs or handles	19
6.6.9	Resistance to impact	19
6.6.10	Deformation	19
6.6.11	Strength test (type test)	20
6.6.12	Leak tightness	20
6.7	Requirements for the assembled product for stationary storage	20
6.7.1	Connections on the tank	20
6.7.2	Internal piping in the tank	20
6.7.3	Leakage indicator	21
6.7.4	Strength test (type test)	21
6.7.5	Leak tightness of assembly	21
6.7.6	Manholes and inspection openings	21
6.7.7	Elastomeric sealing elements	22
6.7.8	Lifting test	22
6.7.9	Provision for spillage caused during filling	22
6.7.10	Resistance against heat effects	22
6.7.11	Periodic recertification of tank installations	22
6.7.12	Documentation and marking	23
6.7.13	Certification mark	23
6.8	Supplementary requirements for the assembled product for mobile storage	23
6.8.1	UN certification	23
6.8.2	Storage of kerosene	23
6.8.3	Connections on the tank	23
6.8.4	Corrosion protection of the spill container	24
6.8.5	Cover for the spill container cover	24
6.8.6	Provision for spillage caused during filling	24
6.8.7	Cabinet for dispensing nozzle and pump	24
6.8.8	Lifting test	24
6.8.9	Documentation	24
6.8.10	Certification mark	24
7	Quality system requirements	25
7.1	General	25
7.2	Manager of the quality system	25
7.3	Internal quality control schedule / quality plan	25
7.4	Qualification of personnel	25
7.5	Qualification/approval of special processes	25
7.6	Procedures and working instructions	25
7.7	Design and/or material changes	25
7.8	Documentation retention	26



8	Summary of tests and inspections	27
8.1	General	27
8.2	Test matrix	27
9	Agreements on the implementation of certification	30
9.1	General	30
9.2	Certification personnel	30
9.3	Qualification requirements	30
9.4	Qualification	31
9.5	Report initial audit	31
9.6	Decision regarding certification	31
9.7	Product certification	31
9.8	Nature and frequency of external audits	32
9.9	Interpretation of the requirements	32
10	List of referenced documents	33
10.1	General	33
10.2	Standards / normative documents:	33
Annex A	Resistance against heat effects	36
Annex B	Model Product certificate	38
Annex C	Model Compliance document	41
Annex D	Model Internal Quality Schedule	42



1 Introduction

1.1 General

This evaluation guideline includes all relevant requirements which are adhered to by Kiwa as the basis for the issue and maintenance of a certificate for PE tanks, with an integrated steel spill container, for the stationary or mobile storage of liquid fuels, heating oil, waste oil and lubricants.

This evaluation guideline replaces BRL-K580/01 dated 1999-02-08.

For the performance of its certification work, Kiwa is bound to the requirements as included in the clause 4.6 "conditions and procedures for granting, maintaining, extending, suspending and withdrawing certification" of NEN-EN-ISO/IEC 17065.

1.2 Field of application / scope

The PE storage tank with integrated spill container is designed for the above ground stationary or mobile storage of liquid fuels, heating oil, waste oil and lubricants.

The PE tanks are designed for:

- Storage of kerosene, diesel fuels, domestic heating oils, waste oils and lubricants;
- Storage of bio diesel fuels with a biological component up to 20% maximum (B20);
- Above ground stationary installation;
- Atmospheric pressure;
- Nominal capacity of 3,000 litres;
- Maximum filling capacity = 95% of the nominal capacity;
- Transport, distribution and mobile storage of fluids (optional).

The PE tanks are not designed for:

- Storage of products that have to be heated in the tank;
- Combined installation such as a battery arrangement;
- Storage under pressure in excess of approximately 30 kPa.

The steel spill containers are designed for:

- Secondary containment of kerosene, (bio) diesel fuels, domestic heating oils, waste oils and lubricants;
- Above ground, inside or outside installation;
- Atmospheric pressure.

The tanks are made from blow moulded polyethylene (PE). The spill containers are made from carbon steel or stainless steel. The manufacturer can choose to have his product comply with the requirements for stationary storage of fluids only or for both stationary and mobile storage of fluids – see § 6.1.

All PE tanks shall have an integrated steel spill container for retaining fluids. The manufacturer is responsible for the correct functioning of the tank and spill container as a combined unit. The operation of the combined unit shall be documented and approved by the manufacturer.

1.3 CE-marking

Relationship with the European Construction Products Regulations (CPR 305/2011):

The storage tanks covered by this product certificate, when used for the storage of domestic heating oil, kerosene and diesel fuels for the supply of building heating/cooling systems, are covered by the European Standard NEN-EN 13341. The essential requirements that pertain to these products are stated in § 4.3.1 of this Evaluation Guideline. These products, when used for the above mentioned application, shall be marked with the CE-marking as stipulated in the relevant harmonised EN.



1.4 Acceptance of test reports provided by the supplier

When by the manufacturer reports from test Institutions or laboratories are produced in order to demonstrate that the product meets the requirements of this evaluation guideline, the institute or laboratory shall meet one of the applicable accreditation norms, being;

- NEN-EN-ISO/IEC 17020 for inspection bodies;
- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17065 for certification bodies certifying products;

This requirement is being considered to be fulfilled when a certificate of accreditation can be shown, either issued by the Board of Accreditation (RvA) or one of the institutions with which the RvA an agreement of mutual acceptance has been concluded.

The accreditation shall refer to the examination as required in this BRL. When no certificate of accreditation can be shown, Kiwa will verify whether the accreditation norm is fulfilled.

1.5 Quality declaration

The quality declarations to be issued by Kiwa are described as Kiwa product certificate. A model of the certificate to be issued on the basis of this Evaluation Guideline has been included as Annex B.



2 Terminology

In this evaluation guideline the following terminology is applicable:

Evaluation Guideline: the agreements made within the Board of Experts on the subject of certification.

Board of Experts: The Board of Experts "TTA – Tanks, Tank installations & Appendages".

Supplier: the party that is responsible for ensuring that the products meet and continue to meet the requirements on which the certification is based.

IQC schedule: a description of the quality inspections carried out by the supplier as part of his quality system.

Product requirements: requirements made specific by means of measures or figures, focusing on (identifiable) characteristics of products and containing a limiting value to be achieved, which limiting value can be calculated or measured in an unequivocal manner.

Pre-certification tests: tests in order to ascertain that all the requirements recorded in the Evaluation Guideline are met.

Inspection tests: tests 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.

Remark

The test matrix contains a summary showing what tests Kiwa will carry out in the pre-certification stage and in the event of inspections as well as showing the frequency with which the inspection tests will be carried out.

Product certificate: a document, in which Kiwa declares that a product may, on delivery, be deemed to comply with the product specification recorded in the product certificate.



3 Terms and definitions

In this evaluation guideline the following terms and definitions are applicable:

Basic material

The basic material is the PE raw material with virgin material and own regrind material for processing into a tank.

Brim full capacity

Volume of water held by the tank filled through the filling orifice to the point of overflowing.

Cover spill container

The upper part of the spill container which prevents the ingress of water and deleterious material.

Maximum filling capacity

95% of the nominal capacity.

Mobile storage of fluids

The term mobile storage is applicable to tanks / spill containers which are suitable for transport when filled. These tanks / spill containers shall also comply with the requirements of ADR and therefore have the UN-identification required by ADR.

Nominal capacity

The nominal capacity of the tank is the capacity specified by the client. This is the value used in the tank calculations.

Spill container

Container which is designed to prevent leakage from the tank entering the environment and which can enable the detection of leakage. The spill container is made of carbon or stainless steel.

Stationary storage of fluids

The term stationary storage is applicable when tanks / spill containers are permanently installed in one location and / or are not suitable for transport when filled.

Tank

A container for fluids, which can retain its designed shape and function in any stage of its designed working life as a stationary storage container. The tank is made from blow moulded PE material.

Tank battery

Two or more tanks installed parallel or in series, whereby use is made of common suction, filling and venting lines without the possibility of isolating any individual tank. A tank battery is **not** included in this Evaluation Guideline.

Virgin material

This is the raw PE-material with additives, pigments or other substances.



4 Legal requirements

4.1 General

This chapter refers to the legal requirements in relation to the tanks and spill containers manufactured in accordance with this Evaluation Guideline.

4.2 Legal requirements

4.2.1 Dutch legislation

The tanks and spill containers manufactured in accordance with this Evaluation Guideline fall under the jurisdiction of the Dutch Ministry for Infrastructure and Environment (I&M). The relevant legislation BARIM (Besluit Algemene Regels voor Inrichtingen Milieubeheer also known as “Activiteitenbesluit”) specifies the requirements pertaining to various activities and these are further clarified in, amongst others, the RARIM (Regeling Algemene Regels voor Inrichtingen Milieubeheer) and the Soil Quality Decree (Besluit Bodemkwaliteit) with its regulation.

One of the stipulations of the RARIM refers to the PGS 30 and the installation in accordance with the Evaluation Guideline BRL-K903. This requirement pertains to all fuels (except for PGS Class 1 fuels).

The certified installation company shall then be able to issue an installation certificate stating that the tank installation complies with the requirement of Evaluation Guideline BRL-K903. Compliance with BRL-K903 can be given when an adequate Risk Inventory and Evaluation (RI&E) has been carried out in accordance with the requirements of document PBV-107776. The tanks and spill containers used for the above ground storage of fuels will be part of this RI&E. The RI&E shall then be evaluated by the Certification Body. On approval of the RI&E the certified installation company can then issue an installation certificate.

The RI&E of each tank installation can be streamlined when use is made of certified products. In that case the RI&E aspects pertaining to these products will not be required. The tanks and spill containers manufactured in accordance with this Evaluation Guideline will comply with all the requirements stipulated in the regulations and the Evaluation Guideline BRL-K903.

Some companies do not fall under the jurisdiction of these regulations. The requirements pertaining to the above ground storage of liquid fuels and lubricants for these companies are laid down in each individual permit. In such cases the local authority shall define the technical and operational requirements for the storage of these fluids in the individual permit and can in a lot of cases refer via the PGS 30, BRL-K903 to this Evaluation Guideline.

4.3 Public requirements

This paragraph contains directions to public requirements set up by legislation for this product. These requirements are related to the Construction Products Regulations (CPR), and the requirements relating to dangerous substances.

4.3.1 Products with CE marking according to the Construction Products Regulations

Components covered by the CPR shall be affixed with the CE mark when they are used in an installation defined by the scope specified in Mandate M/131. Mandate M/131 defines the scope as being “Tanks used in fixed installation, underground or above ground, pressurized or not, used for storage and/or supply of fuel/gas for building heating/cooling systems, and of hot or cold water not intended for human consumption.” Tanks used in industrial purposes and petrol stations are excluded from this mandate.

For blow moulded PE tanks used for the storage for the heating/cooling of buildings solely the requirements of Annex ZA as specified in NEN-EN 13341 are applicable. Only tanks



complying with these requirements shall be affixed with the CE marking. For other applications the requirements of Annex ZA are not applicable and the use of CE marking is not required.

Table 4.1 is according to table ZA.1.2 of NEN-EN 13341 and contains an overview of essential requirements, which these products have to fulfil in relation to the Construction Products Regulations (CPR) 205/2011:2011-03-09, mandated in M/131.

Essential Characteristics	BRL-K580 clause
Mechanical resistance and stability <ul style="list-style-type: none">▪ wall thickness▪ mass	6.5.3 6.5.2
Reaction to fire	6.3.10
Internal Pressure Pressure resistance	6.5.5, 6.5.6
Impact resistance	6.5.4
Permeability Pressure resistance	6.5.5, 6.5.6
Electrostatic behaviour	6.3.11
Tightness Leak tightness	6.5.6
Durability <ul style="list-style-type: none">▪ weather resistance▪ resistance to oil▪ elongation / deformation	6.3.9 6.3.8 6.5.7, 6.5.8

Table 4.1: Essential characteristics for blow moulded static tanks

4.3.2 Requirements relating to dangerous substances

The product shall be such that when installed according to the appropriate provisions of The Netherlands, this product shall not cause harmful emission of toxic gases, dangerous particles or radiation to the internal factory environment, or contamination of the external environment (air, soil or water).



5 Procedure for granting the quality declaration

5.1 Pre certification tests

The pre certification-tests to be performed are based on the (product) requirements as included in this evaluation guideline including the test methods and contain, depending on the nature of the product to be certified:

- Type testing to determine whether the products comply with the product and/or functional requirements,
- Production process assessment
- Assessment of the quality system and the IQC-schedule,
- Assessment of the presence and functioning of the remaining procedures.

5.2 Granting the quality declaration

After finishing the pre-certification tests the results are presented to the person deciding on granting of certificate. This person evaluates the results and decides whether the certificate can be granted or additional data and/or tests are necessary.

6 Requirements and test methods

6.1 General

This chapter contains the product / process requirements to be met by the blow moulded PE tanks with an integrated steel spill container for the storage of fluids and are further detailed in the following sections:

- Design of all tanks in section 6.2;
- Requirements for the blow moulding PE tank material in section 6.3;
- Requirements for the integrated steel spill container material in section 6.4;
- Requirements for the PE tank in section 6.5;
- Requirements for the steel spill container in section 6.6;
- Requirements for the assembled product for stationary storage in section 6.7;
- Supplementary requirements for mobile storage in section 6.8.

The manufacturer shall state whether his product shall comply with the requirements for stationary storage or the additional requirements for mobile storage. This shall be explicitly stated on the product certificate – see Annex B.

6.2 Design drawings and calculations

The design details of the assembled product, materials to be used, lifting instructions, life expectancy of the product and the dimensional tolerances used in production shall be specified by the manufacturer in technical drawings and calculations. The certification body shall evaluate these drawings and design for approval. The design shall be such that the tank can withstand a test pressure of 30 kPa (this relates to the test pressure used during the installation of the tank) without leakage or permanent deformation.

The manufacturer shall define all nominal sizes including capacities proposed for approval. Furthermore, the design shall be based on the following:

- a life expectancy of a minimum of 20 years
- for outside installation which will be based on:
 - an ambient temperature between -20 to $+50$ °C;
 - a maximum wind speed of 29.5 m/sec (results in a wind pressure of 544 N/m²);
 - snow loads of a maximum of 700 N/m² on the cover of the spill container.

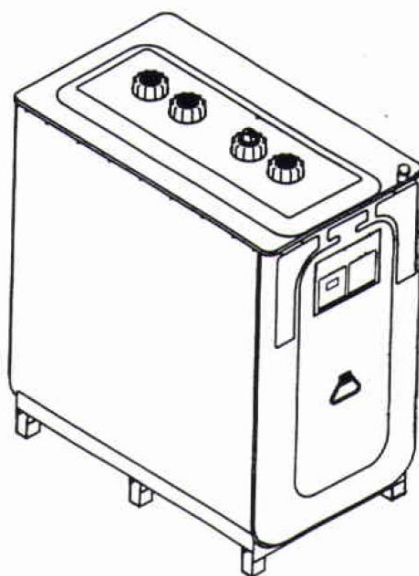


Figure 6.1 – Example of tank with an integrated spill container



6.3 Requirements and test methods of PE material characteristics

6.3.1 Manufacturing process

The PE tanks shall be manufactured by blow moulding.

6.3.2 Materials used

In addition to virgin material the use of own regrind material is permitted. The use of external reworkable or recycled material is not permitted. The proportion of regrind material shall not exceed 50%. The material type and grade used shall be laid down in the contract with the manufacturer.

6.3.3 Density

The reference density of the raw material shall not be less than 938 kg/m^3 when determined according to NEN-EN-ISO 1183-1 method B and NEN-EN-ISO 1183-2. Annealing of the specimen shall be in accordance with NEN-EN-ISO 1872-2.

6.3.4 Melt Mass-flow rate

The melt mass-flow rate (MFR) of the raw material shall be 12.0 g/10 min at $190 \text{ }^\circ\text{C}$ when determined according to NEN-EN-ISO 1133, condition G (mass applied is 21.6 kg). The MFR of material taken from the moulded tank shall also be determined and shall not vary by more than 15% of the MFR for the raw material.

6.3.5 Tensile strength and elongation at yield

The tensile strength at yield of the polyethylene material shall not be less than 21 MPa and the elongation at yield shall not be more than 15% when determined according to NEN-EN-ISO 527-2 on Type 1BA test pieces. A testing speed of 100 mm/min shall be used.

A compression moulded specimen of $3 \pm 0.2 \text{ mm}$ thickness shall be used for this test. The test specimens shall be taken from a section of the blow moulded tank in the direction of the extrusion. The specimens shall be prepared using the conditions specified in Table 2 of NEN-EN-ISO 1872-2 except that the moulding temperature used shall be $200 \text{ }^\circ\text{C}$. The moulding press and mould used shall comply with NEN-EN-ISO 293.

6.3.6 Melt temperature

The polyethylene used for the manufacture of the tank shall have a minimum melt temperature of $+ 120 \text{ }^\circ\text{C}$ when measured by means of the Differential Scanning Calorimetric method in accordance with NEN-ISO 11357-3. This shall be declared by the supplier of the raw material (Certificate of conformity).

6.3.7 Dangerous substances

The manufacturer shall submit a written declaration stating whether or not the material used contains dangerous substances according to the European and national regulations. When and where relevant in the Member States of destination these substances shall be listed.

If the product contains dangerous substances as declared above, the product certificate with technical approval will detail the methods which have been used for demonstrating compliance with the applicable regulations in the Member States of destination, according to the EU data-base (methods of content or release, as appropriate).

6.3.8 Resistance to the stored medium of the base material used

The test for the resistance to the stored medium of the base material of the tank shall be according to NEN-EN 13341. Test specimens shall be taken from a section of the moulded tank. After exposure the following shall be applicable:

- The mass alteration shall be less than 10%.
- Variation in tensile strength at yield shall not exceed 20% of that measured in § 6.3.5.
- Change in elongation at break shall be less than 150% of that measured in § 6.3.5.



Test liquids

The manufacturer can determine which or all of the understated possibilities shall apply to the storage tanks. Depending on the application the following test liquids shall be used:

- A) Kerosene: The test liquid shall be kerosene in accordance with BS 2869 Class 2.
- B) Diesel and/or heating oil: The test liquid shall be Diesel Fuel according to NEN-EN 590.
- C) Bio diesel: The test liquid for testing the resistance to bio diesel B20 shall consist of 80% Diesel Fuel according to NEN-EN 590 and 20% Rapeseed oil Methyl Ester (FAME in accordance with NEN-EN 14214). For B5, B10 and B15 bio diesels the composition of the test liquid shall be adjusted appropriately.
- D) Waste oil and/or lubricants: The test liquid for testing the resistance to waste oils and/or lubricants shall be in accordance with Table 6.1:

<u>Liquid</u>	<u>Specification</u>
5% Petrol	ASTM Fuel B
5% Ethanol	GPR Ethanol
5% Battery Acid	GPR 96% Sulphuric Acid
5% Transmission Fluid	Ford Auto Transmission Fluid: 5 014 519: A85SX 19547 AA
5% Brake Fluid	DOT4 brake oil
75% Engine Oil	IRM 903 lubrication oil

Table 6.1: Test liquid for waste oils and/or lubricants

The test liquid used for testing shall be stipulated on both the tank compliance document (see § 6.7.12.2) as well as the tank identification plate (see § 6.7.13).

6.3.9 Resistance against UV-ageing

The tank, spill container and cover shall be resistant against UV-ageing. The test shall be carried out in accordance with NEN-EN-ISO 4892-1 and NEN-EN-ISO 4892-2 using the following conditions:

- Xenon arc lamp;
- Black standard temperature, 65 °C;
- Relative humidity 65%;
- Spray cycle:
 - duration of spray : 18 minutes,
 - dry interval between spraying: 102 minutes.

For outside installation

The elongation at break of the polyethylene material, after exposure to a global irradiance of 34 GJ/m² (corresponding to an irradiance of 2.3 GJ/m² from the band of 300 nm to 400 nm), shall be greater than 50% of the initial elongation at break, as determined in § 6.3.5. Test specimens shall be taken from a section of the moulded tank and spill container.

For inside installation

The elongation at break of the polyethylene material, after exposure to a global irradiance of 3.4 GJ/m² (corresponding to an irradiance of 0.23 GJ/m² from the band of 300 nm to 400 nm), shall be greater than 50% of the initial elongation at break, as determined in § 6.3.5. Test specimens shall be taken from a section of the moulded tank and spill container.

6.3.10 Reaction to fire

The reaction to fire expresses the contribution of the tank material in the event of fire when tested according using the test methods relevant to the class claimed by the manufacturer. The result shall be classified according to NEN-EN 13501-1.



6.3.11 Electrostatic behaviour

This requirement only applies to tanks used for the storage of fuels with a flash point ≤ 55 °C. The manufacturer shall provide durable notices on all tanks drawing the attention of the user to the appropriate filling procedures which shall be in accordance with NPR-CLC/TR 50404.

6.4 Requirements and test methods of steel material characteristics

6.4.1 Material used

The material used for the manufacture of the carbon steel spill container and the supports shall at least comply with the requirements NEN-EN 10025-2 type S 235 JR. Should use be made of stainless steel then this shall comply with the requirements of UNS 30400 (AISI 304) or UNS 30403 (AISI 304L) or UNS 31600 (AISI 316) or UNS 31603 (AISI 316L) or higher.

6.4.2 Corrosion protection

The outside surface of the carbon steel spill container and steel supports shall be protected by means of a paint system. This paint system shall be certified to the requirements of BRL-K21012 and applied by a company certified in accordance with the requirements of BRL-K790 Scope 6. The paint system used shall be suitable for the corrosion category as determined by the tank installation company in accordance with the requirements of NEN-EN-ISO 12944-2 whereby the corrosivity category C1 is not allowed.

When UNS 31600 (AISI 316) or UNS 31603 (AISI 316L) or higher stainless steel is used for the manufacture of the spill container then the steel surface does not require any additional corrosion protection. When UNS 30400 (AISI 304) or UNS 30403 (AISI 304L) is used then the installation of the tank with spill container is limited to corrosion category C3.

6.5 Requirements and test methods of the PE tank

6.5.1 Visual inspection / appearance

The inner and outer surface of all tanks shall be smooth and flawless, without holes, blisters or other defects. The material shall be free of contamination. The manufacturer's quality system shall include clear procedures for approval and rejection.

6.5.2 Mass of tank

The minimum mass shall be the mass of the lightest tank as determined during the initial type test. The mass shall be determined with all moulded-in inserts but without reinforcements and accessories to an accuracy of $\pm 0.5\%$. The mass of the tank shall be recorded.

6.5.3 Wall thickness

The wall thickness of the tank shall be in accordance with Table 6.2:

Maximum filling capacity	Nominal wall thickness according to BRL-K580 ¹	Minimum wall thickness according EN 13341 ¹
> 400 litre < 1 000 litre	4.2 mm	3.0 mm
$\geq 1 000$ litre < 1 500 litre	4.5 mm	3.2 mm
$\geq 1 500$ litre < 2 000 litre	5.0 mm	3.6 mm
$\geq 2 000$ litre < 2 500 litre	5.0 mm	3.7 mm
$\geq 2 500$ litre < 3 000 litre	5.2 mm	3.9 mm

Note 1: For tanks intended for storage of kerosene, the minimum wall thickness shall be 4.5 mm.

Table 6.2: Wall thickness of tanks

The nominal wall thickness of the tank is the wall thickness at the critical areas of the tank i.e. at the lower knuckle radius with a lower tolerance of -1.2 mm. At the less critical areas i.e. the upper part of the tank the minimum wall thicknesses as specified in the table for the



NEN-EN 13341 wall thickness with a lower tolerance of – 0.0 mm, shall be met. Critical areas are areas where the design analyses show the stresses to be the highest.

6.5.4 Resistance to impact

The tank will be tested separately according to NEN-EN 13341. The test shall be performed on the wall of the construction with and without ribs and at locations that have a low flexibility and are vulnerable to impact.

The tank shall be filled to the point of overflow according to the test procedure of NEN-EN 13341. The tank shall be visually inspected for leak tightness and shall be free of cracks.

6.5.5 Resistance to pressure (type test)

The test is performed according to NEN-EN 13341. The minimum pressure for the test is 50 kPa. After testing the tank shall be leak tight. All types/sizes shall be tested. All connections on the tank shall be properly closed before this test. All connections shall be checked for leaks.

Additionally, all types of tanks shall be leak tight to pneumatic pressure of 30 kPa for at least 30 minutes.

6.5.6 Leak tightness (production test)

All connections on the tank shall be properly closed before performing this test. All connections shall be checked for leaks (for example using a soap solution).

All tanks shall be leak tight to pneumatic pressure of 30 kPa for at least 15 seconds

OR

All tanks shall be leak tight to pneumatic pressure of 10 kPa for at least 60 seconds

OR

All tanks shall be leak tight when completely filled with water for a period of at least 24 hours. It should be noted that this option is not available for tanks with a CE marking.

6.5.7 Elongation

The test for the determination of the elongation is according to NEN-EN 13341. The tank shall be leak proof. Elongation of the surface shall not exceed 1.5% after 1 000 h.

6.5.8 Deformation

The test shall be performed according to NEN-EN 13341.

6.5.9 Resistance against heat effects

The tank shall be tested with the integrated spill container in accordance with § 6.7.10.

6.6 Requirements and test methods of the steel spill container

6.6.1 Visual inspection / appearance

The inner and outer surface of all spill containers shall be smooth and flawless, without pinholes, blisters or other defects.

6.6.2 Wall thickness

The wall thickness of the uncoated spill container shall, after fabrication, be a minimum of 3 mm with a lower tolerance of –10% of the nominal plate thickness.



If the design of the integrated spill container makes use of a closed construction such that the resistance to stress deformation is increased then the absolute minimum wall thickness may be reduced to 1 mm with a normal tolerance in accordance with NEN-EN 10143 of the nominal plate thickness. The suitability of this construction shall be demonstrated by means of subjecting the highest tank to a hydrostatic pressure corresponding to twice the tank height without resulting in any permanent deformation.

6.6.3 Nominal capacity

The spill container shall be able to contain 110% of the nominal capacity of the PE tank without overflowing. The actual volume shall be calculated within a tolerance of -0% and $+5\%$ of the nominal capacity.

6.6.4 Construction of the spill container

The construction of the spill container shall be such that no permanent deformation can occur in the event that the tank should leak. This can be demonstrated by filling the spill container with water to the brim full capacity of the tank whereby no permanent deformation occurs.

The spill container shall not be provided with a drain connection.

6.6.5 Construction of the spill container cover

Spill containers designed in a closed construction in order to increase the resistance to stress deformation – see § 6.6.2 – shall be provided with a cover that is affixed to the spill container body.

Spill containers installed outside shall be provided with a cover in order to prevent the ingress of water and deleterious material.

6.6.6 Construction of the spill container bottom

The bottom of the spill container shall be constructed such that it can support the full weight of the tank when fully filled. The manufacturer shall provide supporting calculations in order to prove this. The spill container shall be supported on (loose) consoles or legs such that the bottom is at least 50 mm above the ground.

6.6.7 Fabrication of spill container

The integrated spill container shall be fabricated by means of welding (see § 6.6.7.1) and/or forming (see § 6.6.7.2). The cover of the integrated spill container may also be fastened by rivets provided these are above the brim full capacity level.

6.6.7.1 Fabrication by welding

The spill container shall be welded on both sides or on one side only provided full penetration is achieved. The welding method shall be in compliance with NEN-EN-ISO 15607, NEN-EN-ISO 15609-1 and NEN-EN-ISO 15614-1. Previous qualification of the welding method to one of the older standards (NEN-EN 288-1, NEN-EN 288-2 and NEN-EN 288-3 respectively) are also acceptable. The welders shall be qualified in accordance with NEN-EN-ISO 9606-1 (formerly NEN-EN 287-1).

The welds obtained shall be examined visually in accordance with NEN-EN-ISO 5817 Level D and shall be free of undercuts and porosity. With the exception of the welding of the consoles or extra reinforcements only continuous welds are allowed.

If the spill container has been manufactured using zinc coated steel plates then the damage to the zinc coating incurred during the welding process shall be repaired prior to closing the integral spill container. The final surface shall be of a smooth appearance and free of any visual defects.



6.6.7.2 Fabrication by forming

Should forming be used then the minimum thickness of the final product shall be at least 92% of the original thickness. If the spill container is made from galvanized steel plates then the forming process shall not damage the zinc coating.

6.6.8 Lifting lugs or handles

The spill container shall be provided with at least two lifting lugs or handles in order to enable the handling of the tank and spill container assembly without causing permanent damage to the spill container or the paint system.

6.6.9 Resistance to impact

Two different tests shall be performed:

Impact test according to ISO 7892

The aim of the test is to determine whether the tank is able to withstand an impact from a large hard body. The impact test has to be performed only on the spill container. The tank and spill container have to be assembled to simulate the situation in the field. The spill container of the assembled combination will be tested according to ISO 7892, § 4.3 performed at ambient temperature (Test ball of 1 kg).

During the test the tank and spill container have to be assembled as a combination. The test shall be performed on the wall of the spill container with and without ribs and at locations that have a low flexibility and are vulnerable to impact.

The impact test shall initially be performed on an empty tank and spill container assembly i.e. no water in the tank. Thereafter, test shall be repeated when the tank is half filled with water i.e. water in the tank but not in the spill container.

After both tests the spill container shall be visually inspected for leak tightness and shall be free of cracks.

Impact test according to NEN-EN 13341

The spill container will be tested according to NEN-EN 13341. The test shall be performed on the wall of the construction with and without ribs and at locations that have a low flexibility and are vulnerable to impact.

The spill container shall be half filled with water. The spill container shall be visually inspected for leak tightness and shall be free of cracks after the test.

6.6.10 Deformation

The spill container shall be tested for deformation as follows:

- The spill container and tank shall be set up under normal assembled conditions.
- The tank and spill container shall be conditioned for 48 hours at 23 ± 2 °C.
- The tank and spill container shall be located on a flat surface with reference to a measuring grid.
- The initial width (W_i) and the length (L_i) shall be measured while the tank and spill container are still empty and taken as the original dimensions.
- A volume of water at a temperature of 16 ± 6 °C and equal to the brim full capacity of the tank shall be 'filled' in the assembled combination of tank and spill container so that the liquid level in the tank and in the spill container are equal in height measured from the flat surface.

Note: The tank does not have to be perforated for this test to ensure that the liquid levels are the same in the tank and the spill container. However, both tank and spill container have to be filled at the same time while ensuring that the difference in the separate liquid levels is minimised during filling.

- When filled the width (W) and the length (L) are measured at day 5, 10 and 15.



- At day 15 the final width (W_f) and length (L_f) are measured.
- The change in width and length of the spill container is calculated by deriving the percentage of change from the final width and length with respect to the initial width and length.

The deformation shall comply with the following:

- Maximum increase of width 13.5%
- Maximum increase of length 12.5%

6.6.11 Strength test (type test)

The spill container shall be tested as follows:

- the inner tank shall be filled with water to its brimful capacity,
- thereafter the space between PE inner tank and spill container shall be filled with water up to brim for a period of 30 minutes;
- during this period there shall be no leakage or deformation of the spill container.

6.6.12 Leak tightness

Each spill container shall be checked for leak tightness. This can be achieved by one of the following methods:

Application of an air pressure of 2 kPa (= 0.02 bar) for at least 60 seconds

OR

Completely filling the spill container with water for a period of 30 minutes.

In the event of any leakage of the spill container the following shall apply:

- For containers with a minimum wall thickness of 3 mm fabricated by welding: repairs may be carried out by using the same welding procedures as for fabricating the tank followed by repeating of the leak tightness test.
- For containers with a lower minimum wall thickness or fabricated by forming: do not repair and discard the container.

6.7 Requirements for the assembled product for stationary storage

6.7.1 Connections on the tank

Each assembled tank with spill container shall be equipped with at least the connections as detailed in Table 6.3. All connections shall be installed at the top of the tank and above the maximum fluid level.

Connection	Minimum size	Position on top of the tank
Filling line	50 mm	Opposite to the vent, as far away as possible
Suction	Not specified	Not specified
Water drain	38 mm	Directly above the lowest point of the tank
Fluid level indicator	38 mm	Not specified and is not mandatory
Vent	38 mm	Highest point of the tank

Table 6.3: Tank connections

The connections on the tank shall be according to NEN-EN 10241 table 12 with a pipe thread according to ISO 7-1.

6.7.2 Internal piping in the tank

The internal piping shall form an integral part of the assembled product. The manufacturer shall test the pipes after assembly.



Piping	Requirements
Fill pipe	If provided, this pipe shall have a 3 mm diameter hole as high as possible
Suction	The distance of the lowest point of this pipe to the bottom of the tank shall be at least the diameter of this pipe
Fluid level indicator	If provided, this pipe shall have a 3 mm diameter hole as high as possible (see note)
Vent	No internal pipe allowed

Table 6.4: Tank piping

Note: When storing a PGS Class 2 product (e.g. Kerosene) an internal pipe for the fluid level indicator connection is mandatory.

Due to the hydraulic cyclical pressure all piping shall be at least PN 16.

6.7.3 Leakage indicator

The assembled product shall have a provision for inspecting for any leakage of the PE tank into the integrated spill container. This can be either a manual or an automatic system. In the event an automatic system is used, a provision shall be made to either test the system at regular intervals or the systems suitability of operation shall be ensured by means of a type test. A provision shall be made to prevent the ingress of fluid through this opening into the spill container.

6.7.4 Strength test (type test)

The assembled product shall be subject to a prototype strength test to ensure that the construction is suitable for the field of application. For this test the assembled product shall be subjected to a water pressure test as follows:

- the space between PE inner tank and spill container shall be filled with water up to half of the tank height;
- the PE inner tank shall be completely filled with water and a hydrostatic pressure of 30 kPa (= 0.3 bar(g)) is subjected to the inner tank for 15 minutes;
- during the application of the pressure the integral spill container may not leak.

Additionally, all types of tanks shall be leak tight to pneumatic pressure of 30 kPa for at least 30 minutes.

6.7.5 Leak tightness of assembly

All connections on the tank shall be properly closed before performing this test. All connections shall be checked for leaks (for example using a soap solution).

All tanks shall be leak tight to pneumatic pressure of 10 kPa for at least 60 seconds or a pressure of 30 kPa for at least 15 seconds.

6.7.6 Manholes and inspection openings

Tanks can be equipped with a manhole for accessing the tank. The manhole opening shall have a minimum internal diameter of 600 mm and shall be located on the top of the tank.

Instead of the manhole the tank may be provided with an inspection opening with a diameter of not less than 70 mm. The inspection opening shall be located on top of the tank and shall be provided with a means of being secured in place so that it can only be used for the intended purpose.

Note: National regulations may require the re-qualification of a tank at periodic intervals. If these regulations stipulate that an internal inspection of the tank has to be carried out by a qualified inspector then a manhole is recommended.



6.7.7 Elastomeric sealing elements

Elastomeric sealing elements shall be resistant to the medium to be stored. This shall be demonstrated in writing by the manufacturer of the sealing element based on the test reports of the actual compound supplied. The testing shall be based on the requirements of NEN-EN 682 type G (or equivalent).

When no information is available regarding the resistance of the elastomeric sealing element to the medium to be stored then this shall be subjected to testing. The testing shall be based on the requirements of NEN-EN 682 (or equivalent) whereby the testing shall be done with the medium to be stored. After performing the swelling test there shall be no visual deterioration of the elastomeric seal.

The suitability of the elastomeric sealing element for the medium to be stored shall be evaluated by the certification body.

6.7.8 Lifting test

The tank and spill container shall be resistance to the lifting forces during transport and installation. The tank shall be filled with 10% of its maximum volume and the spill container shall be lifted by its lifting lugs or handles for a period of 48 hours. After this test the lugs or handles shall show no visible signs of deformation.

6.7.9 Provision for spillage caused during filling

The spill container can have a permanent provision to catch any spillage caused during direct filling. The size of this permanent provision shall be at least 5 litres. This provision is not needed in the case of offset filling.

6.7.10 Resistance against heat effects

The tank with integrated spill container shall be resistant to heat effects to prevent leakage from entering the environment when they are exposed to heat. The test shall be carried out in accordance with Annex A. No leakage shall occur below the water level of the tank with integrated spill container after 60 minutes.

In the event that this is not achievable the manufacturer shall ensure that adequate construction measures can be taken by the installer so that this requirement can be complied with. To this end the manufacturer shall provide the installer of the tank with adequate product information in the installation and user instructions – see § 6.7.12.1.

6.7.11 Periodic recertification of tank installations

All tank installations used for the storage of fuels, waste oils and lubricants require to be recertified in accordance with the requirements of Evaluation Guideline BRL-K903. In order to facilitate this recertification the tank shall be provided with two test strips made of the parent polyethylene material of 30 cm length x 7 cm width x same thickness as the tank wall and shall be obtained from the material from the manhole or inspection opening. Alternatively, the test strips can be blow moulded in a separate mould that is subjected to the same production cycle and is produced simultaneously with the storage tank. The test strips shall be foreseen with two notches in order to facilitate the breaking off of the test strip in 3 equal pieces of 10 x 7 cm. One test strip shall be at an approximate distance of 5 cm from the tank bottom in order to ensure it is continuously exposed to the medium stored. The other test strip shall be at an approximate distance of 5 cm from the top of the tank in order to ensure that it is continuously exposed to the vapours of the medium stored. The test strips shall be indelibly marked with the tank serial number and the original wall thickness. Measures shall be taken to ensure that the test strips can only be removed from the tank by an approved body.



6.7.12 Documentation and marking

6.7.12.1 Installation and user instructions

The manufacturer shall provide proper written installation and user instructions in the language of the country where the tank is to be installed and used. These instructions shall reference compliance with the national environmental regulations pertaining to the storage of fuels. National regulations can stipulate requirements for preventing accidental impact to the tank and spill container, overfill prevention and anti-siphon devices. They shall furthermore refer to compliance to national regulations on the storage of flammable liquids in or near buildings. National regulations can stipulate that installation be carried out by certified installers. For The Netherlands the installer of the tank and spill container shall be certified in accordance with the requirements of Evaluation Guideline BRL-K903. Additional information is available in:

- Guideline BRL-K636 gives requirements for overfill prevention devices.
- Guideline BRL-K903 gives requirements for the installation of tanks and appendages.
- Guideline BRL-K916 gives requirements for anti siphon devices.

In all cases the appendages used shall be resistant to the medium stored and this shall be suitably demonstrated by the tank installer.

6.7.12.2 Documentation

Every PE-tank / steel spill container shall be supplied with at least the following documents:

- Installation / user instructions in the language of the country where the tank is to be installed and used in. The certification body shall approve these instructions.
- A unique tank / spill container compliance document with the approval of the certification body in relation to the product certificate with technical approval (see Annex C).

6.7.13 Certification mark

Each PE-tank and steel spill container shall be indelibly marked with the following items:

- Manufacturers name and trade mark;
- Kiwa certification mark;
- Serial number of the tank and spill container
- Month and year of manufacture;
- Medium to be stored in tank;
- Location of the tank: Inside or Outside;
- Maximum volume of tank in litres or m³;
- Corrosion category of the spill container.

A combination of markings can be made if tanks are CE marked according to the requirements of NEN-EN 13341 Annex ZA § ZA.3.

6.8 Supplementary requirements for the assembled product for mobile storage

6.8.1 UN certification

The assembled tank and spill container shall be certified in accordance with the complete requirements of the VLG/ADR and be provided with a UN approval.

6.8.2 Storage of kerosene

The storage of kerosene is not allowed in the assembled product when used for mobile storage.

6.8.3 Connections on the tank

The vent of each assembled tank with spill container shall be equipped with a safety valve for the prevention of spillage in the event that the tank is not vertical.



6.8.4 Corrosion protection of the spill container

As an alternative to the requirements of § 6.4.2, use can be made of zinc coated carbon steel plates for the manufacture of the steel spill container and steel supports. In that case the zinc coating shall be carried out in accordance with the requirements of NEN-EN 10346 whereby the coating thickness shall be suitable for the corrosion category as determined by the tank installation company in accordance with the minimum requirements of corrosion category C3 as defined in NEN-EN-ISO 12944-2.

6.8.5 Cover for the spill container cover

Spill containers shall always be provided with a cover in order to prevent the ingress of water and deleterious material.

6.8.6 Provision for spillage caused during filling

The spill container shall have a permanent provision to catch any spillage caused during filling. The size of this permanent provision shall be at least 5 litres. It shall be possible to close this provision in order to ensure that there is no accumulation of rain water or deleterious material.

6.8.7 Cabinet for dispensing nozzle and pump

Each integrated tank and spill container assembly shall be provided with a steel cabinet for the installation and storage of the following:

- Dispensing pump
- Flexible delivery hose and dispensing nozzle
- Provision for the safe stowage of the hose
- Provision for the vertical storage of the dispensing nozzle. This nozzle shall be provided with an automatic stop
- Anti-siphon valve at the highest point of the suction pipe if the pump is mounted below the highest fluid level. This valve shall comply with the requirements of BRL-K916.

In the event that the equipment to be tanked up uses its own pump the integrated assembly shall be provided with a leak proof quick coupling to automatically shut off the suction pipe.

The cabinet shall be permanently attached to the steel spill container and be provided with a lockable door. The bottom of the cabinet shall be suitable for catching the small spillage from the dispensing nozzle.

6.8.8 Lifting test

The tank and spill container shall be resistance to the lifting forces during transport and installation. The tank shall be filled with water to its maximum volume and the spill container shall be lifted by its lifting lugs or handles for a period of 48 hours. After this test the lugs or handles shall show no visible signs of deformation. A pallet construction may be used instead of lifting lugs. The pallet construction, if used, should be permanently attached to the integrated spill container. The height of this pallet construction, if provided, must be at least 50 mm.

NOTE: The assembled construction shall be provided with an instruction for hoisting that shall be attached permanently to the outside of the spill container.

6.8.9 Documentation

In addition to the documentation mentioned in § 6.7.12.2, each PE tank with integrated spill container shall be provided with the UN approval and a log book for the registration and possible repairs carried out on the product.

6.8.10 Certification mark

In addition to the marking required in § 6.7.13 the tank shall be marked with the UN identification number.



7 Quality system requirements

7.1 General

This chapter contains the requirements that have to be fulfilled by the manufacturer's quality system.

7.2 Manager of the quality system

Within the manufacturer's organisational structure an employee shall be responsible for managing the manufacturer's quality system.

7.3 Internal quality control schedule / quality plan

As part of the quality system the manufacturer must implement an internal quality control schedule (IQC schedule).

In this IQC-schedule the following must be demonstrably recorded:

- which aspects are inspected by the manufacturer;
- according to which methods these inspections are carried out;
- how often these inspections are carried out;
- how the inspection results are registered and stored.

This IQC schedule shall be in the format as shown in the Annex D. The schedule must be detailed in such a way that it provides the certification body with sufficient confidence that requirements will be continuously fulfilled.

Static process control by the manufacturing shall be performed according to ISO 2859-1, with an inspection and AQL-level to be approved by the certification body.

7.4 Qualification of personnel

All welders involved in the production of the tanks and spill containers shall be qualified for this work in accordance with the procedures of the tank manufacturer. This also applies to the personnel carrying out the dye penetrant inspection, if applicable. The procedures used and the scope of the qualification of each person shall be documented. The manufacturer shall review and renew this documentation on a half yearly basis.

7.5 Qualification/approval of special processes

All welding procedures shall be approved by the manufacturer prior to releasing these procedures for production purposes. This also applies to the personnel operating the blow moulding machines. The qualification of personnel shall be in accordance with these approved procedures. The approvals shall be documented and the manufacturer shall review and renew this documentation on a yearly basis.

7.6 Procedures and working instructions

The supplier shall be able to submit the following:

- Procedures for:
 - Dealing with products showing deviations;
 - Corrective actions to be taken if non-conformities are found;
 - Dealing with complaints about products and/or services delivered;
- The working instructions and inspection forms used.
- Other requirements to be met by the quality system

7.7 Design and/or material changes

Design and/or material changes of the certified products shall always be reported to the certification body prior to the start of production. The certification body shall evaluate these



changes in order to determine the impact these changes have on the initial approved design and to determine which type tests shall have to be repeated.

Products that have been subjected to a design and/or material change can only be identified with the certification body quality stamp after they have been given a written approved by the certification body.

7.8 Documentation retention

Unless otherwise specified, all qualification and inspection records, test reports and material certificates shall be retained for a period of at least 15 years.

8 Summary of tests and inspections

8.1 General

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

- Pre-certification tests;
- Inspection tests of the product requirements;
- Inspection of the quality system.

The frequency with which the certification body will carry out inspection tests is also stated in the summary.

8.2 Test matrix

Description of requirement	BRL Article	Category (see note)	Assessment within the scope of the BRL		
			Initial Evaluation	Inspection of quality system after issue of the certificate	
				Inspection	Freq.
Blow moulded PE tanks with integrated steel spill container					
Design drawings and calculations	6.2	1	X	X	1/year
Requirements and test methods of PE material characteristics					
Manufacturing process	6.3.1	1	X	X	1/year
Materials used	6.3.2	1	X	X	1/year
Density	6.3.3	1	X	X*	1/year
Melt Mass-flow rate	6.3.4	1	X	X*	1/year
Tensile strength and elongation at yield	6.3.5	1	X	X*	1/year
Melt temperature	6.3.6	1	X	X*	1/year
Dangerous substances	6.3.7	2	X	X	When material changed
Resistance to the stored medium of the base material used	6.3.8	1	X	X	When material changed
Resistance against UV-ageing	6.3.9	1	X	X	When material changed
Reaction to fire	6.3.10	2	X	X	When material changed
Electrostatic behaviour	6.3.11	2	X	X	1/year
Requirements and test methods of steel material characteristics					
Material used	6.4.1	1	X	X	1/year
Corrosion protection	6.4.2	1	X	X	Each audit
Requirements and test methods of the PE tank					
Visual inspection / appearance	6.5.1	3	X	X	Each audit
Mass of tank	6.5.2	2	X	X	When design changed
Wall thickness	6.5.3	1	X	X	Each audit
Resistance to impact	6.5.4	2	X	X	When design changed
Resistance to pressure	6.5.5	1	X	X	When design changed
Leak tightness	6.5.6	1	X	X	Each audit
Elongation	6.5.7	2	X	X	When design changed
Deformation	6.5.8	2	X	X	When design changed



Resistance against heat effects	6.5.9	2	X	X	When material changed
Requirements and test methods of the steel spill container					
Visual inspection / appearance	6.6.1	3	X	X	Each audit
Wall thickness	6.6.2	1	X	X	Each audit
Nominal capacity	6.6.3	3	X	X	Each audit
Construction of the spill container	6.6.4	1	X	X	Each audit
Construction of the spill container cover	6.6.5	1	X	X	Each audit
Construction of the spill container bottom	6.6.6	1	X	X	Each audit
Fabrication	6.6.7	1	X	X	Each audit
Lifting lugs or handles	6.6.8	2	X	X	When design changed
Resistance to impact	6.6.9	2	X	X	When design changed
Deformation	6.6.10	2	X	X	When design changed
Strength test (type test)	6.6.11	2	X	X	When design changed
Leak tightness	6.6.12	1	X	X	Each audit
Requirements for the assembled product for stationary storage					
Connections on the tank	6.7.1	1	X	X	Each audit
Internal piping in the tank	6.7.2	1	X	X	Each audit
Leakage indicator	6.7.3	2	X	X	When design changed
Strength test (type test)	6.7.4	1	X	X	When design changed
Leak tightness of assembly	6.7.5	1	X	X	Each audit
Manholes and inspection openings	6.7.6	2	X	X	Each audit
Elastomeric sealing elements	6.7.7	2	X	X	1/year
Lifting test	6.7.8	2	X	X	When design changed
Provision for spillage caused during filling	6.7.9	2	X	X	When design changed
Resistance against heat effects	6.7.10	2	X	X	When design changed
Periodic recertification of tank installations	6.7.11	1	X	X	Each audit
Documentation and marking	6.7.12	1	X	X	Each audit
Certification mark	6.7.13	1	X	X	Each audit
Supplementary requirements for the assembled product for mobile storage					
UN certification	6.8.1	1	X	X	Each audit
Storage of kerosene	6.8.2	1	X	X	Each audit
Connections on the tank	6.8.3	1	X	X	Each audit
Corrosion protection of the spill container	6.8.4	1	X	X	Each audit
Cover for the spill container cover	6.8.5	1	X	X	Each audit
Provision for spillage caused during filling	6.8.6	1	X	X	Each audit
Cabinet for dispensing nozzle and pump	6.8.7	1	X	X	Each audit
Lifting test	6.8.8	2	X	X	When design changed



Documentation	6.8.9	1	X	X	Each audit
Certification mark	6.8.10	1	X	X	Each audit
Quality system requirements					
Internal quality control schedule / quality plan	7.3	2	X	X	1/year
Qualification of personnel	7.4	2	X	X	2/year
Qualification/approval of special processes	7.5	2	X	X	1/year
Procedures and working instructions	7.6	3	X	X	1/year
Design and/or material changes	7.7	2	X	X	1/year
Documentation retention	7.8	2	X	X	1/year
X* = Certificate of conformity (specifications from suppliers)					

Table 8.1: Test and audit matrix

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 the certification body 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.



9 Agreements on the implementation of certification

9.1 General

In addition to the requirements stipulated in this Evaluation Guideline the general requirements pertaining to certification as stated in the Kiwa-Regulations for Product Certification will be applicable.

Specifically, the following shall be applicable:

- The general procedure for executing the initial evaluation including:
 - The method of informing the suppliers regarding the processing of the application;
 - The execution of the initial evaluation;
 - The decision taken after the execution of the initial audit.
- The general procedure for executing the audits and the relevant checkpoints;
- The procedure to be implemented by the certification body in the event of non-conformities;
- The procedure to be followed by the certification body in the event of unauthorized use of the certificates, certification mark, pictograms and logos.
- The procedure to be followed in the event of termination of the certificate;
- The possibility to contest a decision made by the certification body.

9.2 Certification personnel

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

- **Certification engineer:** they are in charge of carrying out the pre-certification tests and assessing the inspectors' reports;
- **Inspectors:** 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.

9.3 Qualification requirements

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



Requirements EN 17065	Function and responsibility		
	Certification Engineer	Inspector	Decision maker
Education: general	<ul style="list-style-type: none"> Relevant technical education at Bachelor level or higher Internal training in certification and Kiwa policy Training in audit skills 	<ul style="list-style-type: none"> Technical vocational education at intermediate level or higher Internal training in certification and Kiwa policy Training in audit skills 	<ul style="list-style-type: none"> Technical education at Bachelor level or higher Internal training in certification and Kiwa policies Training in audit skills
Education: specific	<ul style="list-style-type: none"> Training related to this Evaluation Guideline Specific courses and training (knowledge and skills) related to plastics 	<ul style="list-style-type: none"> Training related to this Evaluation Guideline Specific courses and training (knowledge and skills) related to plastics 	<ul style="list-style-type: none"> Not applicable
Experience: general	<ul style="list-style-type: none"> 1 year of relevant working experience A minimum of 4 complete certification cycles of which at least 1 has been witnessed for qualification 	<ul style="list-style-type: none"> 1 year of relevant working experience A minimum of 4 complete certification cycles of which at least 1 has been witnessed for qualification 	<ul style="list-style-type: none"> 4 years of working experience, with a minimum of 1 year of experience with certification
Experience: specific	<ul style="list-style-type: none"> Detailed knowledge of this Evaluation Guideline A minimum of 4 complete certification cycles for this Evaluation Guideline or related Evaluation Guidelines 	<ul style="list-style-type: none"> Detailed knowledge of this Evaluation Guideline A minimum of 4 complete certification cycles for this Evaluation Guideline or related Evaluation Guidelines 	<ul style="list-style-type: none"> Basic knowledge of this Evaluation Guideline

Table D.9.1: Qualification requirements for certification personnel

The level of education and the experience of the certification staff involved should be demonstrably recorded.

9.4 Qualification

Certification personnel shall be qualified on the basis of the above mentioned criteria. Should qualification be otherwise determined then this shall be recorded.

The responsibility for the qualification of the certification personnel is determined by:

- Decision-makers: qualification of certification engineers and inspectors
- Management of the certification body: qualification of the Decision-makers.

9.5 Report initial audit

The certification body shall detail the findings of the initial audit in a report. This report shall comply with the following:

- Complete: The report shall indicate the findings pertaining to each and every requirement detailed in this Evaluation Guideline;
- Traceability: The findings used to determine compliance with the requirements shall be traceable;
- Basis for the decision: The decision maker responsible for certification shall be able to decide on the basis of the findings detailed in the report.

9.6 Decision regarding certification

The decision to certify the supplier shall be made by a qualified decision maker who has not participated in the initial audit. This decision shall be traceable.

9.7 Product certification

The product certificate shall be in conformance with the model in Annex B.



9.8 Nature and frequency of external audits

The certification body shall ensure that the supplier continues to comply with the certification requirements. The number of external audits shall be determined by the Board of Experts. At the time of publication of this Evaluation Guideline the number of audits has been fixed at 2 audits per year.

The audits shall at least include:

- The IQC schedule of the supplier and the results of the internal inspections carried out;
- The correct marking of the certified products;
- The implementation of the required procedures.

The audit results shall be reported by the Kiwa inspector in a report.

9.9 Interpretation of the requirements

The Board of Experts may specify how the requirements are to be interpreted. These interpretations shall be documented in a separate interpretation document.



10 List of referenced documents

10.1 General

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

10.2 Standards / normative documents:

<u>Standard number</u>	<u>Title</u>	<u>Revision</u>
BRL-K636	Overfill prevention devices for storage tanks for liquid petroleum fuels	
BRL-K790	Application of coatings on steel storage tanks or steel pipes and fittings	
BRL-K903	Certification scheme for Installers of Tank Installations (REIT)	
BRL-K916	Anti Siphon Devices	
BRL-K21012	Uitwendige verfsystemen ten behoeve van bovengrondse stalen opslagtanks	
BS 2869	Fuel oils for agricultural, domestic and industrial engines and boilers	
ISO 7-1	Pipe threads where pressure tight joints are made on the threads — Part 1: dimensions, tolerances and designations	
ISO 2859-1	Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	
ISO 7892	Vertical building elements — impact resistance tests — impact bodies and general test procedure	
NEN-EN 590	Automotive fuels - Diesel - Requirements and test methods	
NEN-EN 682	Elastomeric seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids	
NEN-EN 10025-2	Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels	
NEN-EN 10143	Continuously hot-dip coated steel sheet and strip - Tolerances on dimensions and shape	
NEN-EN 10241	Steel threaded pipe fittings	
NEN-EN 10346	Continuously hot-dip coated steel flat products – Technical delivery conditions	



<u>Standard number</u>	<u>Title</u>	<u>Revision</u>
NEN-EN 13341 Incl. Amdt. 1:2011	Thermoplastic static tanks for above ground storage of domestic heating oils, kerosene and diesel fuels — Blow moulded polyethylene, rotational moulded polyethylene and polyamide 6 by anionic polymerisation tanks — Requirements and test methods	2005-04-01
NEN-EN 13501-1	Fire classification of construction products and building elements — Part 1: Classification using the test data from reaction to fire test	
NEN-EN 14214	Automotive fuels — Fatty acid methyl esters (FAME) for diesel engines — Requirements and test methods	
NEN-EN-ISO 293	Plastics — Compression moulding of test specimens of thermoplastic materials	
NEN-EN-ISO 527-2	Plastics — Determination of the tensile properties — Part 2: Test conditions for moulding and extrusion plastics	
NEN-EN-ISO 1133	Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics	
NEN-EN-ISO 1183-1	Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pyknometer method and titration method	
NEN-EN-ISO 1183-2	Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method	
NEN-EN-ISO 1872-2	Plastics — Polyethylene (PE) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties	
NEN-EN-ISO 4892-1	Plastics – Methods of exposure to laboratory light sources Part 1: General guidance	
NEN-EN-ISO 4892-2	Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps	
NEN-EN-ISO 5817	Welding — Fusion welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections	
NEN-EN-ISO 9606-1	Qualification testing of welders - Fusion welding - Part 1: Steels	
NEN-EN-ISO 12944-2	Paints and varnishes - Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments	
NEN-EN-ISO 15607	Specification and qualification of welding procedures for metallic materials - General rules	
NEN-EN-ISO 15609-1	Specification and qualification of welding procedures for metallic materials - Welding procedure specification — Part 1: Arc welding	



<u>Standard number</u>	<u>Title</u>	<u>Revision</u>
NEN-EN-ISO 15614-1	Specification and qualification of welding procedures for metallic materials - Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys	
NEN-ISO 11357-3	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization	
NPR-CLC/TR 50504	Electrostatics — Code of practice for the avoidance of hazards due to static electricity	



Annex A Resistance against heat effects

A.1 Principle

A secondary containment with its tank half filled with water is installed in a ventilated room and submitted to heat effects due to burning of stacks of spruce set close by. The behaviour of the secondary containment with its tank is observed during a determined time period.

A.2 Test room

Testing shall be carried out in a test room (see Figure A.1) with the following internal dimensions:

- Length: 3.50 ± 0.25 m
- Width: 2.5 ± 0.25 m
- Height: 2.5 ± 0.25 m

The maximum volume of the test room shall be 22 ± 2 m³. The air feeding of the room shall be obtained by means of a window opening made in one of the walls constituting the room width, which dimensions are 0.80 ± 0.05 m x 0.50 ± 0.05 m.

A.3 Burning material

Burning material is composed by two stacks of 25 kg each conditioned spruce (section 4 cm x 4 cm). Each stack of spruce is prepared in such manner that the ratio of wood to air is 1:1. The dimensions of each stack are 1 m long, 48 cm high and 25 cm width.

A.4 Test specimen

The test specimen is a storage tank with the corresponding spill container. For a series of tanks with spill containers produced by the same mould design, the test shall be performed on the largest tank with integrated secondary container.

A.5 Procedure

The test specimen shall be installed in the middle of the room parallel to the window opening (see Figure A.1). The tank shall be filled with water up to 50% of its maximum filling capacity.

Between the secondary containment and the window opening at a distance of 10 cm from the secondary containment wall the two stacks of conditioned spruce shall be arranged in the longitudinal axis. The ignition is made by four soft fibres strips soaked with 10 ml kerosene set at two opposite sides of each wood stack.

During testing, the temperatures in the testing room shall be measured and recorded. The combustion is stopped 60 minutes after the ignition.

After stopping the combustion, there shall be no leakage under the water level of the tank with integrated spill container.

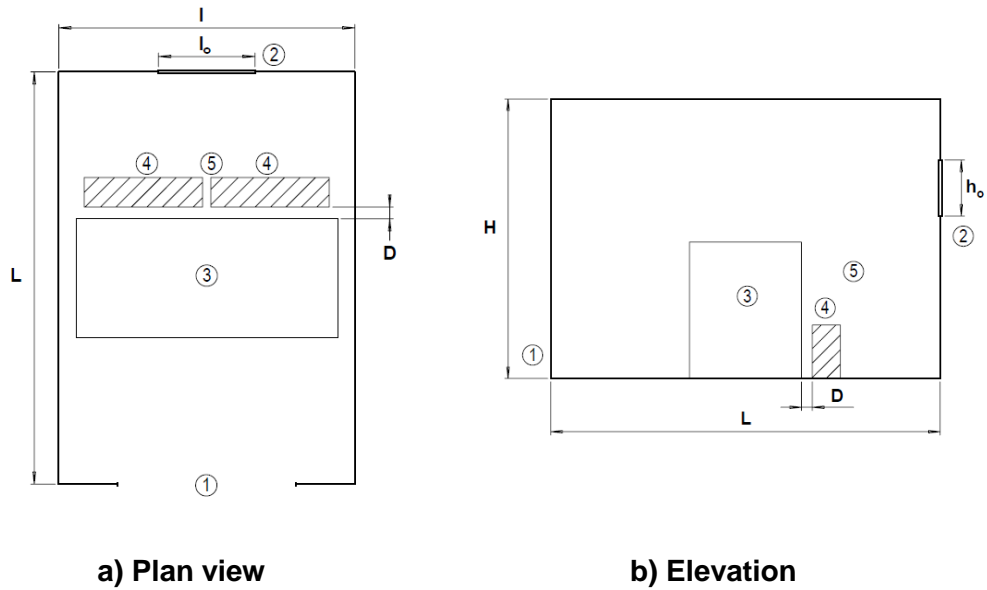


Figure A.1 – Installation for determination of performance against heat effects

Key

- | | | | |
|-------|---|---|---------------------------------|
| L | length of the testing room | 1 | entrance door |
| I | width of the testing room | 2 | opening |
| H | height of the testing room | 3 | tank with secondary containment |
| D | distance between the stacks and the secondary containment | 4 | stacks of spruce |
| h_o | height of opening | 5 | ignition area |
| l_o | width of opening | | |

Annex B Model Product certificate

Certificate

Number	K12345/01	Replaces	
Issued	2015-01-01	Dated	--

Product certificate with technical approval
PE tanks, with an integrated steel spill container, for the stationary or mobile storage of liquid fuels, heating oil, waste oil and lubricants

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', manufactured by

ABC Company

may, on delivery, be relied upon to comply with the Kiwa Evaluation Guideline BRL-K580/02 dated 2015-01-01 "PE tanks, with an integrated steel spill container, for the stationary or mobile storage of liquid fuels, heating oil, waste oil and lubricants".

Kiwa N.V.

ing. B. Meekma

Director
Certification and Inspection

This certificate is issued in accordance with the Kiwa Regulations for Product Certification and consists of 3 pages.
Publication of the certificate is allowed.

Supplier

ABC Company
Polyethylene Road 1
1234 AA Plastics

Telephone +31-12-345 6789
Telefax +31-12 345 6790
E-mail info@abccompany.nl
Internet www.abccompany.nl

Kiwa Nederland B.V.
Sir W. Churchill-laan 273
P.O. Box 70
2280 AB Rijswijk
The Netherlands
Tel. +31 70 41 44 400
Fax +31 70 41 44 420
Internet www.kiwa.nl



Number	K12345/01	Replaces	--	
Page:	Issued	2015-01-01	Dated	--

PE tanks, with an integrated steel spill container, for the stationary or mobile storage of kerosene, (bio) diesel fuels, heating oil, waste oil and lubricants

PRODUCT SPECIFICATION

Tank type: XXX with an integrated steel spill container for stationary storage

Tank type YYY with an integrated steel spill container for stationary and mobile storage

The tank with integrated spill container is suitable for installation in areas with a corrosion category of C3/C4/C5-I/C5-M.

The tank type ZZZ are provided with a provision for spillage caused during direct filling.

These tanks have not been tested for their resistance against heat effects.

APPLICATION AND USE

The PE tanks are designed for storage of:

- kerosene, diesel fuels, domestic heating oil, waste oils and lubricants;
- bio diesel fuels with a biological component up to 20 % maximum (B20);
- above ground installation;
- atmospheric pressure;
- maximum volume of 3,000 litres;
- maximum filling capacity = 95% of the nominal capacity;
- transport, distribution and mobile storage of fluids.

The PE tanks are not designed for:

- storage of products that have to be heated in the tank;
- combined installation such as a battery arrangement;
- storage under pressure in excess of approximately 5 kPa.

The spill containers are designed for:

- secondary containment of kerosene, (bio) diesel fuels, domestic heating oils, waste oils and lubricants;
- above ground, inside or outside installation;
- atmospheric pressure.

The tanks are made from blow moulded polyethylene (PE). The spill containers are made from carbon steel or stainless steel.

All tanks shall be installed with a secondary containment for retaining fluids.

The tank manufacturer is responsible for the correct functioning of the tank and spill container as a combined unit. The operation of the combined unit shall be documented and approved by the manufacturer of the tank.

The product certificate with technical approval is only applicable if the requirements mentioned in § 6.7.12 of this guideline are fulfilled for tanks intended for stationary installation and 6.8.9 of this guideline are fulfilled for tanks intended for mobile storage. These are:

Installation and user instructions for stationary and mobile storage

The manufacturer shall provide proper written installation and user instructions in the language of the country where the tank is to be installed and used. These instructions shall reference compliance with the national environmental regulations pertaining to the storage of fuels. National regulations can stipulate requirements for preventing accidental impact to the tank and spill container, overfill prevention and anti siphon devices. They shall



Number K12345/01 Replaces --

Page: Issued 2015-01-01 Dated --

furthermore refer to compliance to national regulations on the storage of flammable liquids in or near buildings. National regulations can stipulate that installation be carried out by certified installers. For The Netherlands the installer of the tank and spill container shall be certified in accordance with the requirements of Evaluation Guideline BRL-K903. Additional information is available in:

- Guideline BRL-K636 gives requirements for overfill prevention devices.
- Guideline BRL-K903 gives requirements for the installation of tanks and appendages.
- Guideline BRL-K916 gives requirements for anti-siphon devices.

Documentation for stationary and mobile storage

Every PE-tank / spill container shall be supplied with at least the following documents:

- Installation / user instructions in the language of the country where the tank is to be installed and used in. The certification body shall approve these instructions.
- A unique tank / spill container compliance document with the approval of the certification body in relation to the product certificate with technical approval.

Supplementary documentation for mobile storage

Each PE tank with spill container shall be supplied with at least the following documents:

- The UN certificate.
- A log book for the registration and possible repairs carried out on the product.

MARKING

The products are marked with the Kiwa quality mark

Place of the mark:

Each PE-tank with a closed steel spill container shall be indelibly marked. For a PE-tank with an open steel spill container both the tank and spill container shall be indelibly marked.

The realization of the marks is as follows:

- Indelible;
- Visible from the outside.

Compulsory marking for stationary installation:

- Manufacturers name and trade mark
- Certification mark
- Serial number of the tank and spill container
- Maximum volume in litre's or m³
- Month and year of manufacture;
- Medium to be stored in tank;
- Location of the tank: Inside or Outside;
- Corrosion category of the spill container.

Additional compulsory marking for mobile installation:

- UN certification number

-
1. Check at the time of delivery whether:
 - 1.1 the products are in accordance with the agreement;
 - 1.2 the mark and marking method are correct;
 - 1.3 the products show no visible defects as a result of e.g. transport.
 2. If you should reject a product on the basis of the above, please contact:
 - 2.1 <<Organisation>> <<Department>>
and, if necessary:
 - 2.2 Kiwa Nederland B.V.
 3. Consult the supplier's processing guidelines for a proper storage and transport of the products.
 4. Check whether this certificate is still valid by consulting the list of certified companies at www.kiwa.nl.

Annex C Model Compliance document

Tank/Spill Container compliance document

BRL-K580/02

Blow moulded polyethylene (PE) tank, with an integrated steel spill container

Client

(name)
(address)
(town)

Manufacturer

(name)
(address)
(town)
(telephone)

Location

(name)
(address)
(town)

(telefax)
(e-mail)

Registration Number

Registration date

Tank serial no.

Data	Value	Class	Corrosion type
Year and month of construction	2014-10	C2	Low
Tank nominal volume (l)		C3	Medium
Construction	PE tank with a steel spill container	C4	High
Tank type	Round, Vertical (DxH) / Round, Horizontal (DxL) / Rectangular (LxBxH)	C5-I	Very high, Industrial
Dimensions	DxH / DxL / LxBxH	C5-M	Very high, Marine
Tank material	Blow moulded PE		
Spill container serial no.			
Spill container material	UNS 30400 / UNS 30403 / UNS 31600 / UNS 31603		
Suitable for corrosion category	C2 / C3 / C4 / C5-I / C5-M		
Suitable for media	Kerosene / bio diesel (B20) / domestic heating oil / waste oils / lubricants		
Location	Inside / Outside		
Suitable for transport & mobile storage	UN no.		

Declaration of Kiwa Nederland B.V.

Based on pre-certification tests as well as periodic inspections by Kiwa, the product referred to on this compliance document, may, on delivery, be relied upon to comply with the Kiwa Evaluation Guideline BRL-K580/02.

Declaration of Construction Company

The manufacturer declares that the tank and spill container have been produced according to the requirements specified in the Kiwa Evaluation Guideline BRL-K580/02.

General

A stationary tank installation can only be in compliance with the Dutch legislation when, in addition to this tank/spill container compliance document, an installation certificate for the complete installation has been issued. For mobile storage the installation certificate is not required.

Recommendations for Customers:

Check on receipt of the tank/spill container compliance document whether:

- The serial number on the tank and spill container complies with this document
- The tank and spill container show no visible defects as a result of transport

If you should reject this product on the basis of the above, please contact:

1. The manufacturer
2. Kiwa Nederland B.V.



Kiwa Nederland B.V.
Sir W. Churchill-laan 273
P.O. Box 70
2280 AB Rijswijk
The Netherlands

Telephone +31 70 41 44 400
Telefax +31 70 41 44 420
Internet www.kiwa.nl
E-mail certif@kiwa.nl

A copy of this document shall be given to the: Legislative authorities, Client, Manufacturer, Kiwa Ned. B.V.



Annex D Model Internal Quality Schedule

Inspection subjects	Inspection aspects	Inspection method	Inspection frequency	Inspection registration
Raw materials or materials supplied <ul style="list-style-type: none"> ▪ PE granulates ▪ Incoming goods inspection raw materials 				
Production process, production equipment, material: <ul style="list-style-type: none"> ▪ Procedures ▪ Working instructions ▪ Equipment ▪ Release of product 				
Finished-products: <ul style="list-style-type: none"> ▪ Visual inspection ▪ Dimensional inspection ▪ Wall thickness ▪ Leak tightness 				
Measuring and testing equipment <ul style="list-style-type: none"> ▪ Measuring equipment ▪ Calibration ▪ Test equipment 				
Transport & Storage <ul style="list-style-type: none"> ▪ Internal transport ▪ Storage ▪ Packaging ▪ Preservation ▪ Identification or marking of semi-manufactures and end-products 				