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# Static thermoplastic tanks for above ground storage of domestic heating oils, kerosene and diesel fuels - Blow moulded and rotationally moulded polyethylene tanks and rotationally moulded tanks made of anionically polymerized polyamide 6 - Requirements and test methods

Réservoirs statiques en thermoplastiques destinés au stockage non enterré de fioul domestique de chauffage, de pétrole lampant et de gazole - Réservoirs en polyéthylène moulés par soufflage et par rotation et réservoirs moulés par rotation fabriqués en polyamide 6 polymérisé de manière anionique - Exigences et méthodes d'essai

Ortsfeste Tanks aus Thermoplasten für oberirdische Lagerung von Haushalts-Heizölen, Kerosin und Dieselkraftstoffen - Tanks, die aus blasgeformtem und rotationsgeformtem Polyethylen sowie aus rotationsgeformtem anionisch polymerisiertem Polyamid 6 hergestellt wurden - Anforderungen und Prüfverfahren



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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**



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# Foreword

This document (EN 13341:2005+A1:2011) has been prepared by Technical Committee CEN/TC 266 “Thermoplastic static tanks”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2011, and conflicting national standards shall be withdrawn at the latest by July 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1, approved by CEN on 2010-11-27.

This document supersedes EN 13341:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌A1⟩ ⟨A1▌.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with Construction Product Directive (89/106/EEC), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

# Introduction

[A1] *deleted text* [A1]

This document does not include tanks for the transport and distribution of fuels or gasses, or tanks for the storage of gas or for cooling systems.

[A1] Flammable fuels with a flash point $> 55$ °C as determined by EN ISO 2719 (i.e. domestic heating oil and diesel fuel) are suitable to be stored in the tanks described in this document without further requirements.

Flammable fuels with a flash point $\leq 55$ °C as determined by EN ISO 2719 (i.e. kerosene) are also suitable to be stored in the tanks described in this document if the requirements concerning electrostatic behaviour according to CLC/TR 50404 are fulfilled. [A1]

The attention of the user should be drawn to national safety and environmental regulations or other regulations that apply when installing thermoplastic tanks, and the suitability of fuels to be stored therein.

## 1 Scope

〈A1〉 This document specifies requirements for materials, physical properties and performance of single blow moulded and rotationally moulded polyethylene tanks and of rotationally moulded tanks made of anionically polymerized polyamide 6, with or without reinforcements, for above ground storage of domestic heating oil, kerosene and diesel fuels for the supply of building heating/cooling systems.

It is only applicable to static blow moulded and rotationally moulded polyethylene tanks and to rotationally moulded tanks made of anionically polymerized polyamide 6 that are subject to atmospheric pressure, but not subject to any external loading and have a capacity from 400 l up to 10 000 l. 〈A1〉

〈A1〉 *deleted text* 〈A1〉

## 2 Normative references

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.

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

EN 13160-2, *Leak detection systems — Part 2: Pressure and vacuum systems*

EN 13160-3, *Leak detection systems — Part 3: Liquid systems for tanks*

EN 13160-4, *Leak detection systems — Part 4: Liquid and/or vapour sensor systems for use in leakage containments or interstitial spaces*

EN 13160-5, *Leak detection systems — Part 5: Tank gauge leak detection systems*

EN 13160-6, *Leak detection systems — Part 6: Sensors in monitoring wells*

EN 13160-7, *Leak detection systems — Part 7: General requirements and test methods for interstitial spaces, leak protecting linings and leak protecting jackets*

EN 13501-1, *Fire classification of construction products and building elements — Part 1. Classification using test data from reaction to fire tests*

EN 13616, *Overfill prevention devices for static tanks for liquid petroleum fuels*

EN ISO 175, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175:1999)*

〈A1〉 EN ISO 293:2005, *Plastics — Compression moulding of test specimens of thermoplastic materials (ISO 293:2004)* 〈A1〉

〈A1〉 EN ISO 527-2:1996, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994)* 〈A1〉

〈A1〉 *deleted text* 〈A1〉

〈A1〉 EN ISO 1133:2005, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:2005)* 〈A1〉

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1:2004)*

EN ISO 1183-2, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method (ISO 1183-2:2004)*

A1 EN ISO 1872-2:2007, *Plastics — Polyethylene (PE) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties (ISO 1872-2:2007)* A1

EN ISO 4892-1, *Plastics — Method of exposure to laboratory light sources — Part 1: General guidance (ISO 4892-1:1999)*

EN ISO 4892-2, A1 *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2006)* A1

A1 EN ISO 15512, *Plastics — Determination of water content (ISO 15512:2008)* A1

CLC/TR 50404, *Electrostatics — Code of practice for the avoidance of hazards due to static electricity*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

**3.1**
**tank**
container for the storage of domestic heating, kerosene and diesel fuels at atmospheric pressure which retains its designed shape without any reinforcements when empty

**3.2**
**brimful capacity (of a tank)**
volume of water held by the tank filled through the filling orifice to the point of overflowing

**3.3**
**maximum filling capacity (of a tank)**
value of 95 % of the brimful capacity

**A1 3.4**
**reinforcement**
constitutive element of a tank which contributes to its mechanical stability

NOTE For example, one or several strapping(s), a secondary containment A1.



## 4 Requirements

### 4.1 Materials

#### 4.1.1 General

Raw materials and samples taken from tanks shall be tested and fulfil the requirements according to Table 1.

The proportion of regrind from the same material shall not exceed 50 % for blow-moulded tanks.

Regrind shall not be used for rotationally moulded tanks.

Tanks for external installation shall be sufficiently opaque so as to protect the contents from degradation by ultra violet light. The manufacturer may use visual or prescriptive means to demonstrate compliance with this requirement.

### 4.1.2 Reaction to fire

[A1] Where the tank is subject to regulatory requirements, the material shall be classified in accordance with EN 13501-1.

NOTE This sub-clause does not cover resistance to fire issues. [A1]

### 4.1.3 Electrostatic behaviour

Electrostatic behaviour is not a characteristic of the tank or tank material but a phenomenon resulting from some storage media and the filling procedure. Manufacturers shall provide durable notices on all sizes of tanks with appropriate wording drawing the users attention to filling procedures according to CLC/TR 50404 for flammable liquids with a flash point < 55 °C.

[A1]

### 4.1.4 Content and/or release of dangerous substances

Materials used for the tanks according to this standard shall not contain or release any dangerous substances. [A1]

**Table 1 — Material requirements**

| Type of material | Property | Requirement | Test method |
|---|---|---|---|
| Blow moulded polyethylene | Density [a] | Shall not be less than 938 kg/m$^3$ | A.1.1 |
| | Melt flow rate [b] | Shall be less than 12 g/10 min at 190 °C, 21,6 kg<br>Maximum increase of the melt flow rate of the moulded tank shall not be greater than 15 % of the value determined on the raw material. | A.1.2 |
| | Tensile strength [c] | Tensile strength at yield shall not be less than 21 MPa.<br>Elongation at yield shall not be more than 15 %. | A.1.3 |
| | Resistance to oil [c] | Mass alteration shall be less than 10 %.<br>Variation in tensile strength at yield shall not exceed 20 % of that measured in A.1.3.<br>Change in elongation at yield shall not exceed 150 % of that measured in A.1.3. | A.1.4 |
| Rotationally moulded polyethylene | Density [a] | A single polymer resin shall have a density not less than 934 kg/m$^3$. | A.2.1 |
| | Melt flow rate [b] | Shall be 4,0 g/10 min ± 3,0 g/10 min at 190 ºC, 2,16 kg.<br>Maximum variation of the melt flow rate of moulded tank shall not be greater than 20 % of the value determined on the raw material. | A.2.2 |
| | Tensile strength [c] | Tensile strength at yield shall not be less than 15 MPa.<br>Elongation at yield shall not be more than 25 %.<br>The elongation at break shall not be less than 200 %. | A.2.3 |
| | Resistance to oil [c] | Mass alteration shall be less than 10 %.<br>Variation in tensile strength at yield shall not exceed 20 % of that measured in A.2.3.<br>Change in elongation at break shall be less than 150 % of that measured in A.2.3. | A.2.4 |
| Polyamide 6<br>(by anionic polymerization) | Tensile strength [c] | Tensile strength shall not be less than 30 MPa at yield.<br>Elongation shall be more than 20 % at break. | A.3.1 |
| | Resistance to oil [c] | Mass alteration shall be less than 0,4 %.<br>Variation in tensile strength shall not exceed 5 % of that measured in A.3.1.<br>Elongation at break shall be more than 20 %. | A.3.2 |
| | Colour bleed [c] | The bleed time of any sample shall not be less than 5,5 h. | A.3.3 |
| 〈A1〉 Blow moulded polyethylene<br><br>Rotationally moulded polyethylene<br><br>Polyamide 6 (by anionic polymerisation) | Resistance to weathering [c] | For external installations after exposure to global radiant exposure of 34 GJ/m$^2$ (corresponding to a radiant exposure of 2,3 GJ/m$^2$ for the band from 300 nm to 400 nm) the elongation at break shall be greater than 50 % of the initial value.<br>For internal installations the elongation at break after exposure to global radiant exposure of 3,4 GJ/m$^2$ (corresponding to a radiant exposure of 0,23 GJ/m$^2$ for the band from 300 nm to 400 nm) shall be greater than 50 % of the initial elongation at break.<br>The manufacturer shall ensure that changing the additive package does not decrease weather resistance. | A.1.3, A.1.5<br><br>A.2.3, A.2.5<br><br>A.3.1, A.3.4 〈A1〉 |

[a] Test to be carried out on raw material.

[b] Test to be carried out on raw material and on sample taken from a tank.

[c] Test to be carried out on tank.



## 4.2 Design

### 4.2.1 Filling systems

In the case of direct fill, the aperture for filling shall be a minimum 38 mm in diameter and shall be covered with a cap or lid.

#### 4.2.2 Supports

The manufacturer shall provide instructions for appropriate tank support.

#### 4.2.3 Venting systems

All tanks shall be equipped with venting facilities. The minimum cross sectional area of the venting pipe shall not be less than the sum of the smallest cross sectional area of the filling system with a minimum diameter of 38 mm.

#### 4.2.4 Suction/outlet system

Tanks shall be equipped with an opening permitting the safe and reliable connection of withdrawal systems. All fittings shall be corrosive resistant. The tank outlet may be installed above or below the liquid level.

#### 4.2.5 Drainage

Where the outlet is installed below the liquid level, access shall be provided to allow the tank to be drained of sludge by means of a dip tube and pump.

#### 4.2.6 Overflow alarm device

All tanks shall have provision for an overfill prevention system according to EN 13616.

#### 4.2.7 Contents gauge connection facility

If the level of liquid can be seen through the walls of the tank a contents gauge is not required. In all other cases provision shall be made for a contents gauge to be fitted.

#### 4.2.8 Leak detection system

If a leak detection system is used, it shall fulfil the requirements according to EN 13160-1 to 7.

#### 4.2.9 Inspection facilities

Facilities for internal inspection (manholes, etc) of the tank/contents shall be designed so that they shall not affect the performance of the tank according to the requirements of this document.



## 5 Evaluation of conformity

### 5.1 General

The compliance of thermoplastic tanks with the requirements of this ▌A1⟩ standard ⟨A1▌ and with the stated values (including classes) shall be demonstrated by:

— initial type testing;

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

▌A1⟩ For the purposes of testing, thermoplastics tanks may be grouped into families, where it is considered that the results for one or more characteristics are representative for those same characteristics for all other products within that family.

NOTE Tanks can be in different families for different characteristics. ⟨A1▌

## 5.2 Type testing

A1

### 5.2.1 Testing

Initial type testing (ITT) shall be performed to demonstrate compliance with this standard, for all tanks.

Tests previously performed in accordance with the provisions of this standard (same tank, same characteristic(s), test method, sampling procedure, system of attestation of conformity, etc.) may be taken into account.

All essential characteristics, for which the manufacturer declares performances, are subject to Initial Type Testing.

Whenever one of the following changes occurs the Initial Type Tests shall be repeated as given in Table 2:

i) when the method of production is altered in such a way as to affect type test performance;

ii) when the manufacturer changes the base polymer grade used;

iii) when changes are made in the dimensions of wall thickness, height, diameter, length, width or configuration for any tank.

Test methods, given in Annexes A and B, which shall be used for ITT, are specified in Table 2.

### 5.2.2 Sampling

A sufficient number of tanks shall be randomly selected from the production batch to complete all the tests for ITT.

**Table 2 — Initial type testing of tanks**

| Type of tank | Property | Test method | Testing relevant to [a] | | | | Number of tanks per family to be tested | Comment |
|---|---|---|---|---|---|---|---|---|
| | | | I | i | ii | iii | | |
| Blow moulded polyethylene tanks | Density | A.1.1 | + | | + | | 1 | Any one from the family |
| | Melt flow rate | A.1.2 | + | | + | | | |
| | Tensile strength | A.1.3 | + | | + | | | |
| | Resistance to oil | A.1.4 | + | | + | | | |
| | Resistance to weathering | A.1.5 | + | | + | | | |
| Rotationally moulded polyethylene tanks | Density | A.2.1 | + | | + | | 1 | Any one from the family |
| | Melt flow rate | A.2.2 | + | | + | | | |
| | Tensile strength | A.2.3 | + | | + | | | |
| | Resistance to oil | A.2.4 | + | | + | | | |
| | Resistance to weathering | A.2.5 | + | | + | | | |
| Polyamide 6 tanks by anionic polymerization | Tensile strength | A.3.1 | + | | + | | 1 | Any one from the family |
| | Resistance to oil | A.3.2 | + | | + | | | |
| | Colour bleed | A.3.3 | + | | + | | | |
| | Resistance to weathering | A.3.4 | + | | + | | | |
| | Water content | B.9 | + | | + | | | |
| All tanks | Capacity | B.1 | + | | | + | Each | |
| | | | | | + | | 1 | Any one from the family |
| | Visual appearance | B.2 | + | | | + | Each | |
| | | | | | + | | 1 | Any one from the family |
| | Mass | B.3 | + | | | + | Each | |
| | | | | | + | | 1 | Any one from the family |
| | Wall thickness | B.4 | + | | | + | Each | |
| | | | | | + | | 1 | Any one from the family |
| | Impact resistance | B.5 | + | | | + | Each | |
| | | | | + | + | | 1 | The most critical tank [c] |
| | Deformation or elongation [b] | B.6 | + | | | + | Each | |
| | | | | + | + | | 1 | The most critical tank [c] |
| | Pressure resistance | B.7 | + | | | + | Each | |
| | | | | + | + | | 1 | The most critical tank [c] |
| | Leak tightness | B.8 | + | | | + | Each | |
| | | | | + | + | | 1 | The most critical tank [c] |

[a] I is initial type test in case of a new family
i), ii) and iii) are changes as mentioned in 5.2.1
+ means testing relevant for the characteristic
void means testing not relevant for the characteristic

[b] see Tables 4 and 5 for the choice of the test method

[c] the most critical tank of the family as defined during the Initial Type Test "I".
If none, the largest tank will normally be selected assuming this size is considered as having the worst performance

A1

## 5.3 Factory production control (FPC)

### 5.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform to the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

The tests listed in Table 3 shall be used to determine that satisfactory conformity is maintained during production and records should also be maintained within a factory production control system. The documentation regarding the factory production control shall be kept for at least 10 years.

**Table 3 — Factory production control**

| Type of tank | Property | Test method | Test to be carried out on tank and/or raw material | Frequency |
|---|---|---|---|---|
| Blow moulded polyethylene tanks | Melt flow rate | A.1.2 | Tank | Once every working week on a programme that covers all machines |
| | | | Raw material [a] | Every new batch |
| | Mass | B.3 | Tank | Every tank |
| Rotationally moulded polyethylene tanks | Melt flow rate | A.2.2 | Tank | Once every working week on a programme that covers all machines |
| | | | Raw material [a] | Every new batch |
| | Mass | B.3 | Tank | Every shot and one tank per shift |
| Polyamide 6 tanks by anionic polymerization | Colour bleed | A.3.3 | Tank | At the beginning and the end of the working week |
| | Mass | B3 | Tank | Every tank |
| All tanks | Visual appearance | B.2 | Tank | Every tank |
| | Wall thickness | B.4 | Tank | Every tank at its critical points as identified by the manufacturer and an overall test per shift |
| | Leak tightness | B.8 | Tank | Every tank |

[a] This requirement may be waived if the raw material manufacturer supplies a certificate of conformity with each delivery, i.e. a document which certifies that the material supplied is in compliance with the melt flow rate as specified in an agreed supply specification.



An FPC system conforming to the requirements of EN ISO 9001, and made specific to the requirements of this document, is considered to satisfy the above requirements.

The results of inspections, tests or assessments requiring action shall be recorded, as shall any action taken. The action to be taken when control values or criteria are not met shall be recorded and retained for the period specified in the manufacturer's FPC procedures.

### 5.3.2 Equipment

#### 5.3.2.1 Testing equipment

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

#### 5.3.2.2 Manufacturing equipment

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

### 5.3.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their conformity.

### 5.3.4 Non-conforming products

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

### 5.3.5 Process control

In order to ensure conformity subsequent to initial type testing a factory production control shall meet at least the following:

— production testing according to Table 3 to confirm the conformity of the product to the performance of the type tested sample;

— records of the results of production control (manufacturer's records) which shall include at least the following:

  — identification of the product tested;

  — dates of sampling;

  — test methods applied;

  — test and inspection results;

  — date of tests;

  — identification of the responsible authority within the manufacturer;

  — calibration records;

  — machinery maintenance and inspection records;

  — test equipment maintenance and inspection records.

#### 5.3.6 Continuous surveillance

Routine inspections shall include the following:

— manufacturing records;

— production testing according to Table 3 which confirm the conformity of product in the course of the normal production process to the performance of the type tested sample;

— test records;

— remedial actions for any non-conformities found;

— extraordinary inspections to verify implementation of the necessary remedial actions, if any major non-conformities were found.

NOTE The timing of the extraordinary inspection should be determined according to the nature of the non-conformities which are to be remedied.

## 6 Requirements for tanks

Blow moulded polyethylene tanks shall be tested and fulfil the requirements according to Table 4.

**Table 4 — Requirements for blow moulded polyethylene thermoplastic tanks**

| Property | Requirement | | Test method |
|---|---|---|---|
| Capacity | The brimful capacity shall be measured.<br>The maximum filling capacity, declared by the manufacturer, shall be checked. | | B.1 |
| Visual appearance | There shall be no bubbles, blisters or other defects in the tank wall which could cause a hole or fracture. | | B.2 |
| Mass | The minimum mass shall be the mass of the lightest tank as determined by the initial type test. | | B.3 |
| Wall thickness | For tanks intended for storage of kerosene, the minimum wall thickness shall be 4,5 mm, or if the wall thickness is less than 4,5 mm, the tank manufacturer shall demonstrate by a test method that the oil permeation is equal or less than the permeation through a rotationally moulded tank sample with a thickness of 4,5 mm and made of a polyethylene with a density of 934 kg/m$^3$.<br>For tanks tested in accordance with B.6.1, the minimum wall thickness shall not be less than 2,5 mm and, for factory production control the minimum wall thickness shall be the wall thickness as determined by the initial type test.<br>For tanks tested in accordance with B.6.2, the minimum wall thickness shall be as follows, except for each area which surface does not exceed 300 mm$^2$, where a margin of 10 % shall be allowed regarding the minimum wall thickness. These areas shall be located a minimum of 50 mm from the bottom of the tank. The manufacturer shall declare in a document, that the margin has no effects on the physical properties of the tank. | | B.4 |
| | For maximum filling capacity | Minimum wall thickness | |
| | [A1] ≥ 400 l, < 1 000 l | 3,0 mm [A1] | |
| | ≥ 1 000 l, < 1 500 l | 3,2 mm | |
| | ≥ 1 500 l, < 2 000 l | 3,5 mm | |
| | ≥ 2 000 l, < 2 500 l | 3,7 mm | |
| | ≥ 2 500 l, < 3 000 l | 3,9 mm | |
| | ≥ 3 000 l, < 3 500 l | 4,0 mm | |
| | The minimum wall thickness of tanks with a maximum [A1] filling [A1] capacity ≥ 3 500 l shall be determined according to B 6.1. | | |
| Impact resistance | The tank shall remain leak tight. | | B.5 |
| Elongation | The tank shall remain leak tight.<br>Elongation at the surface shall no exceed 1,5 % after 1 000 h. | | B.6.1 |
| Deformation | The volumetric deformation is stabilized when the rate of volumetric expansion is not greater than 0,015 % volume, per day, for tanks with a maximum filling capacity of up to and including 3 800 l or 0,02 % volume, per day, for tanks with a maximum filling capacity of over 3 800 l.<br>After stabilisation the deformation shall conform to the following equations:<br>$w_d \leq w_i + 100\ mm$<br>$l_d \leq l_i + 200\ mm$<br>where<br>$l_d$ is the length of the tank after deformation in mm;<br>$l_i$ is the initial length of the tank in mm;<br>$w_d$ is the width of the tank after deformation in mm;<br>$w_i$ is the initial width of the tank in mm. | | B.6.2 |
| Pressure resistance | [A1] The tank shall be leak tight. [A1]<br>In the case of reinforced tanks the reinforcement shall retain its reinforcing function up to a hydrostatic pressure corresponding to twice the tank height. | | B.7 |
| Leak tightness | The tank shall be leak tight. | | B.8 |

Rotationally moulded tanks shall be tested and fulfil the requirements according to Table 5.

**Table 5 — Requirements for rotationally moulded polyethylene tanks**

| Property | Requirement | | Test method |
|---|---|---|---|
| Capacity | The brimful capacity shall be measured.<br>The maximum filling capacity, declared by the manufacturer, shall be checked. | | B.1 |
| Visual appearance | There shall be no bubbles, blisters or other defects in the tank wall which could cause a hole or fracture. | | B.2 |
| Mass | The minimum mass shall be the mass of the lightest tank as determined by the initial type test. | | B.3 |
| Wall thickness | For tanks intended for storage of kerosene, the minimum wall thickness shall be 4,5 mm.<br>For tanks tested in accordance with B.6.1, the minimum wall thickness shall not be less than 2,5 mm and, for factory production control the minimum wall thickness shall be the wall thickness as determined by the initial type test.<br>For tanks tested in accordance with B.6.2, the minimum wall thickness shall be as follows, except for each area which surface does not exceed 300 $mm^2$, where a margin of 10 % shall be allowed regarding the minimum wall thickness. These areas shall be located a minimum of 50 mm from the bottom of the tank. The manufacturer shall declare in a document, that the margin has no effects on the physical properties of the tank. | | B.4 |
| | For maximum filling capacity | Minimum wall thickness | |
| | ≥ 400 l, < 1 000 l | 3,3 mm | |
| | ≥ 1 000 l, < 1 500 l | 3,5 mm | |
| | ≥ 1 500 l, < 2 000 l | 3,9 mm | |
| | ≥ 2 000 l, < 2 500 l | 4,1 mm | |
| | ≥ 2 500 l, < 3 000 l | 4,3 mm | |
| | ≥ 3 000 l, < 3 500 l | 4,4 mm | |
| | ≥ 3 500 l, < 5 000 l | 4,8 mm | |
| | ≥ 5 000 l, < 7 500 l | 5,1 mm | |
| | ≥ 7 500 l, ≤ 10 000 l | 5,4 mm | |
| Impact resistance | The tank shall remain leak tight | | B.5 |
| Elongation | The tank shall remain leak tight.<br>Elongation at the surface shall not exceed 1,5 % after 1 000 h. | | B.6.1 |
| Deformation | The volumetric deformation is stabilized when the rate of volumetric expansion is not greater than 0,015 % volume, per day, for tanks with a maximum filling capacity of up to and including 3 800 l or 0,02 % volume, per day, for tanks with a maximum filling capacity of over 3 800 l.<br>After stabilisation the deformation shall conform to the following equation:<br>$w_d \leq w_i + 100\ mm$<br>$l_d \leq l_i + 200\ mm$<br>where<br>$l_d$ is the length of the tank after deformation in mm;<br>$l_i$ is the initial length of the tank in mm;<br>$w_d$ is the width of the tank after deformation in mm;<br>$w_i$ is the initial width of the tank in mm. | | B.6.2 |
| Pressure resistance | The tank shall be leak tight.<br>In the case of reinforced tanks the reinforcement shall retain its reinforcing function up to a hydrostatic pressure corresponding to twice the tank height. | | B.7 |
| Leak tightness | The tank shall be leak tight. | | B.8 |

Anionic polymerized polyamide 6 tanks shall be tested and fulfil the requirements according to Table 6.

**Table 6 — Requirements for polyamide 6 (by anionic polymerisation) tanks**

| Property | Requirement | | Test method |
|---|---|---|---|
| Capacity | The brimful capacity shall be measured.<br>The maximum filling capacity as declared by the manufacturer shall be checked. | | B.1 |
| Visual appearance | There shall be no bubbles, blisters or other defects in the tank wall which could cause a hole or fracture. | | B.2 |
| Mass | The minimum mass shall be the mass of the lightest tank as determined by the initial type test. | | B.3 |
| Wall thickness | The minimum wall thickness shall be 2,0 mm. | | B.4 |
| Impact resistance | The tank shall remain leak tight. | | B.5 |
| Elongation | Water content<br>% | Maximum surface elongation after 1 000 h<br>% | B.9<br>B.6.1 |
| | 2 to 2,5<br>2,5 to 3<br>3 to 3,5 | 1,1<br>1,3<br>1,6 | |
| Pressure resistance | [A1] The tank shall be leak tight. [A1]<br>In the case of reinforced tanks the reinforcement shall retain its reinforcing function up to a hydrostatic pressure corresponding to twice the tank height. | | B.7 |
| Leak tightness | The tank shall be leak tight. | | B.8 |



## 7 Durability

The mechanical characteristics of the tank shall be deemed durable for a reasonable economic working life if it is in conformity with the relevant requirements of Tables 1, 4, 5 and 6.

The manufacturer shall declare the suitability of the tank for external/internal or internal use only.

## 8 [A1] Marking, transport, handling and installation of tanks [A1]

### 8.1 Marking

The following information shall be marked legibly, visibly and durably on the tank:

a) permitted location (internal and/or external);

b) month and year of manufacture;

c) brimful capacity;

d) maximum filling level for translucent tanks;

e) EN 13341;

f) description of the product to be stored e.g. "For storage of domestic heating oils, diesel fuels and/or kerosene’’;

g) details covering relevant installation instructions e.g. "Shall be installed in accordance with the manufacturers instructions and local regulations";

h) serial number;

i) identification of manufacturer;

j) material type.

Where ZA.3, requires the CE marking to be accompanied by the same information as required by this clause, the requirements of this clause are met. Where any of the following are provided as part of regulatory marking, the same information need not be duplicated in the marking required by this clause.

## 8.2 Transport and handling

The manufacturer’s instructions and national requirements regarding transportation, storage, mounting and maintenance shall be adhered to.

〈A1〉

## 8.3 Installation

The manufacturer shall provide installation instructions which, where relevant, shall also take into account wind and snow loading. 〈A1〉

# Annex A
(normative)

# Test methods for determination of material characteristics

## A.1 Blow moulded polyethylene

### A.1.1 Density

The density of the raw material shall be measured in accordance with EN ISO 1183-1 and EN ISO 1183-2. The method in accordance with EN ISO 1872-2 shall be used to anneal the specimen.

### A.1.2 Melt flow rate

The melt flow rate of the raw material and of a section taken from any location on the moulded tank shall be measured in accordance with ▌A1⟩ EN ISO 1133:2005 ⟨A1▐, using Condition G.

### A.1.3 Tensile strength

▌A1⟩ The test shall be carried out in accordance with EN ISO 527-2:1996 at a testing speed of 100 mm/min, using Type 1B test pieces from plates cut in the wall thickness of the blow moulded tank in the direction of extrusion.

For the determination of elongation at break after artificial weathering (see A.1.5), the type 1B test pieces shall be prepared by machining weathered plates cut in the original wall thickness of the blow moulded PE tank after the exposure of the plates to artificial weathering. ⟨A1▐

### A.1.4 Resistance to oil

The increase in mass shall be determined by immersing a pressed specimen 50 mm x 50 mm x 1 mm thick in oil until it reaches equilibrium at 40 °C, (equilibrium point is reached when the change in mass after one week interval is less than 0,5 %).

The alteration in mass shall be determined in accordance with EN ISO 175.

The effect on tensile properties shall be determined by repeating the test in A.1.3 on a specimen immersed in oil at 40 °C until it reaches equilibrium, (equilibrium point is reached when the change in mass after one week interval is less than 0,5 %).

Where the test is carried out for tanks for the storage of kerosene, for safety reasons, the storage test with kerosene shall be carried out at 30 °C.

### A.1.5 Resistance to weathering

▌A1⟩ Specimens shall be taken from the moulded tank and the outer surface shall be exposed to UV radiation in accordance with EN ISO 4892-1 and EN ISO 4892-2. ⟨A1▐ The test shall be carried out under the following conditions:

a) xenon arc lamp;

b) black standard temperature: 65 °C;

c) relative humidity: 65 %;

d) spray cycle:

— duration of spray:18 min,

— dry interval between spraying: 102 min.

## A.2 Rotationally moulded polyethylene

### A.2.1 Density

The density of the raw material shall be measured in accordance with EN ISO 1183-1 and EN ISO 1183-2. The method in accordance with EN ISO 1872-2 shall be used to anneal the specimen.

### A.2.2 Melt flow rate

The melt flow rate of the raw material and of a section taken from any location on the moulded tank shall be measured in accordance with [A1] EN ISO 1133:2005 [A1], using Condition D.

### A.2.3 Tensile strength

[A1]

#### A.2.3.1 Preparation of compression-moulded specimens

##### A.2.3.1.1 Apparatus

Use a moulding press and a mould in accordance with 4.1 and 4.2 of EN ISO 293:2005, respectively.

The mould thickness shall be appropriate to obtain a final thickness of the compression-moulded specimen of (3 ± 0,2) mm.

##### A.2.3.1.2 Procedure

Cut a square specimen in the wall thickness of the moulded tank of a mass calculated to fill 105 % of the volume of the cavity of the mould.

The compression-moulded specimens shall be prepared using the conditions specified in Table 2 of EN ISO 1872-2:2007, except for the moulded temperature to be applied which shall be 200 °C, to obtain a final thickness of (3 ± 0,2) mm.

#### A.2.3.2 Tensile testing

The test shall be carried out in accordance with EN ISO 527-2:1996 at a testing speed of 100 mm/min, using Type 1BA test pieces cut in a specimen prepared according to A.2.3.1.2.

For the determination of elongation at break after artificial weathering (see A.2.5), the type 1BA test pieces shall be prepared by machining the weathered specimens. [A1]

### A.2.4 Resistance to oil

The increase in mass shall be determined by immersing a pressed specimen 50 mm x 50 mm x 1 mm thick in oil until it reaches equilibrium at 40 °C, (equilibrium point is reached when the change in mass after one week interval is less than 0,5 %).

The alteration in mass shall be determined in accordance with EN ISO 175.

The effect on tensile properties shall be determined by repeating the test in A.2.3 on a specimen immersed in oil at 40 °C until it reaches equilibrium, (equilibrium point is reached when the change in mass after one week interval is less than 0,5 %).

Where the test is carried out for tanks for the storage of kerosene, for safety reasons, the storage test with kerosene shall be carried out at 30 °C.

### A.2.5 Resistance to weathering

〉A1〈 Specimens shall be taken from the rotationally moulded tank and prepared in accordance with A.2.3.1 and the outer surface shall be exposed to UV radiation in accordance with EN ISO 4892-1 and EN ISO 4892-2. 〈A1〉 The test shall be carried out under the following conditions:

a) xenon arc lamp;

b) black standard temperature: 65 °C;

c) relative humidity: 65 %;

d) spray cycle:

— duration of spray:18 min,

— dry interval between spraying: 102 min.

## A.3 〉A1〈 Rotationally moulded Polyamide 6 (by anionic polymerization) 〈A1〉

### A.3.1 Tensile strength

〉A1〈 The test shall be carried out in accordance with EN ISO 527-2:1996 at a testing speed of 100 mm/min, using Type 1BA test pieces cut in the wall thickness of the rotationally moulded Polyamid 6 tank.

For the determination of elongation at break after artificial weathering (see A.3.4), the type 1BA test pieces shall be prepared by machining the weathered plates cut in the original wall thickness of the rotationally moulded Polyamide 6 tank. 〈A1〉

### A.3.2 Resistance to oil

The increase in mass shall be determined by immersing a pressed specimen 50 mm x 50 mm x 1 mm thick in oil for 14 days at 40 °C.

The alteration in mass shall be determined in accordance with EN ISO 175.

The effect on tensile properties shall be determined by repeating the test in A.3.1 on a specimen immersed in oil for 14 days at 40 °C.

Where the test is carried out for tanks for the storage of kerosene, for safety reasons, the storage test with kerosene shall be carried out at 30 °C.

### A.3.3 Colour bleed

Cylindrical specimens of 3 mm diameter and (4 ± 0,5) mm in height shall be taken perpendicular to the surface of the tank wall with a moisture content not exceeding 0,7 %.

The test shall be conducted in specimen glasses of (4 ± 0,1) mm internal diameter and 80 mm in length.

The following test media shall be used:

a) 96 % solution of sulphuric acid, and

b) 96 % solution of sulphuric acid stained blue/green by the addition of 0,19 ml of diphenylamine and 0,19 ml of a 65 % solution of nitric acid per litre.

The specimen glass shall be filled to a height of 33 mm with unstained sulphuric acid and the cylindrical specimen shall be immersed in the liquid with the aid of a glass rod (taking care that the sulphuric acid is free of bubbles).

The glass shall be placed in a hot bath at (90 ± 2) °C and shall be steeped for 3 h. After steeping 22 mm of stained sulphuric acid shall be poured in and the glass shall be left in the hot bath for a further 2,5 h.

The steeped specimen shall be examined to detect any obvious delineation between specimen and stained sulphuric acid (ensuring stained sulphuric acid has not penetrated the lower unstained sulphuric acid).

The test shall be repeated for at least six representative test samples.

### A.3.4 Resistance to weathering

〚A1〉 Specimens shall be taken from the moulded tank and the outer surface shall be exposed to UV radiation in accordance with EN ISO 4892-1 and EN ISO 4892-2. 〈A1〛 The test shall be carried out under the following conditions:

a) xenon arc lamp;

b) black standard temperature: 65 °C;

c) relative humidity: 65 %;

d) spray cycle:

— duration of spray:18 min,

— dry interval between spraying: 102 min.

# Annex B
(normative)

# Test methods for determination of tank characteristics

## B.1 Capacity

The tank shall be conditioned at (20 ± 5) °C for 48 h and then be filled to the point of overflow at a rate of 150 l/min ± 40 l/min with water at (15 ± 5) °C. After 10 min the tank shall be filled again to overflow and the brimful capacity shall be measured to an accuracy of ± 1 %.

## B.2 Visual appearance

The visual inspection shall be carried out with suitable illumination in order to detect faults according to Table 4, 5 or 6 as applicable.

The marking in accordance with Clause 8 shall be checked.

## B.3 Mass

The mass of the tank shall be measured with all moulded-in inserts, without reinforcements and accessories to an accuracy of ± 0,5 %.

Record the mass of the tank.

## B.4 Wall thickness

The wall thickness shall be determined rounded to the nearest 0,1 mm using ultrasonic wall thickness measurement equipment calibrated in accordance with the manufacturer's instructions. A reference test piece of similar thickness, manufactured by the same process and from the same raw material as the tank shall be used for measurement.

## B.5 Impact resistance

The tank shall be filled to overflow with water at a temperature of (15 ± 5) °C.

An impact hammer or pendulum shall be used, (in the form of an equilateral triangle with rounded tips and edges having radii of 3 mm). The five most vulnerable surfaces of the tank (normally corners or stiff sections) shall be subjected to an impact of 30 J, see Figure B.1.

Dimensions in millimetres

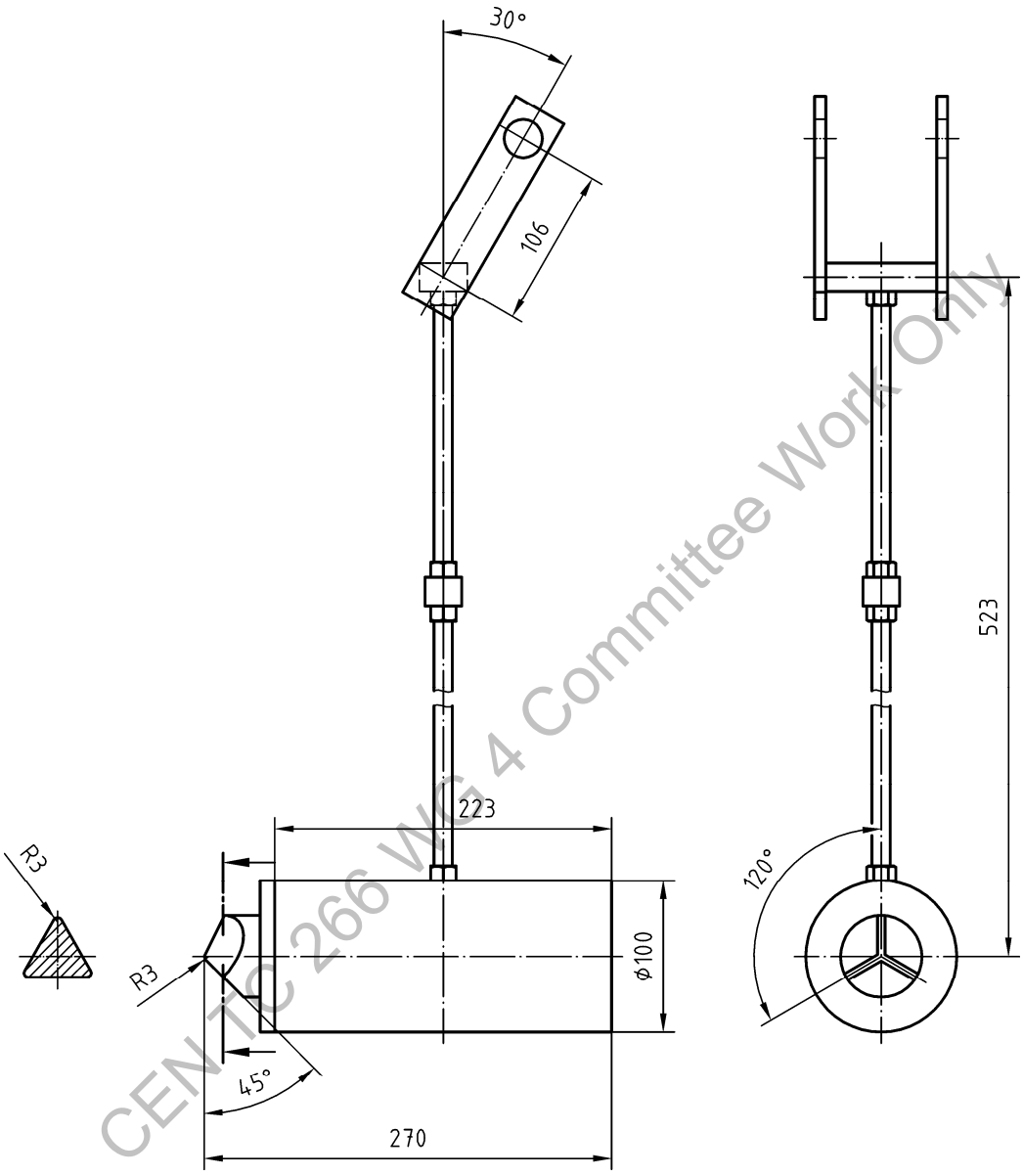




**Figure B.1 - Impact resistance test equipment**

## B.6 Elongation or deformation

### B.6.1 Elongation

The elongation test shall be carried out on the lightest tank from the samples at (23 ± 2) °C.

At points on the tank where the greatest deformation is expected, a minimum of five expansion measurement strips shall be fitted (use the results from the pressure resistance test in accordance with B.7 to determine the measuring point).

The tank shall be filled with water at a temperature not exceeding 23 °C. The test pressure shall correspond to 1,3 times the hydrostatic pressure at the deepest part of the tank and shall be kept constant for 1 000 h. The expansion shall be measured per decade at least three times in logarithmically equal intervals (at least nine measurements in 1 000 h).

### B.6.2 Deformation

The deformation test shall be carried out on the lightest tank from the samples at (23 ± 2) °C.

A tank shall be subjected to a test pressure corresponding to 1,3 times the hydrostatic pressure at the deepest part of the tank for a minimum of 30 days and a maximum of 42 days.

Reinforced tanks shall be tested with their reinforcements.

The temperature of the test room shall be (23 ± 2) °C and the pressure variation during the test shall not exceed 2 %.

The tank shall be placed on flat ground with reference to a measurement grid so as to be able to determine its length and width.

The tank shall be stabilised by filling it with 30 cm of water.

The initial length ($l_i$) and height ($h_i$) shall be determined and the initial width ($w_i$) shall be measured in at least three cross-sections where the deformation, due to the hydrostatic pressure, is most critical.

The tank shall be filled to brimful capacity at a filling rate of (700 ± 100) l/h and shall be pressured to 1,3 $h_i$.

The total amount of water added to the tank at filling and pressuring stage shall be determined and the length and width shall be measured at the same locations after 5, 18 and 27 days.

From day 28 the volume change shall be measured until the volume has stabilised for 2 successive days to a maximum of 42 days.

The volume deformation is stable when the value is not greater than 0,015 % volume per day for tanks up to and including 3 800 l capacity or 0,02 % volume for tanks over 3 800 l.

After stabilization the length ($l_d$) and width ($w_d$) shall be measured.

## B.7 Pressure resistance

The pressure resistance test shall be carried out on the second lightest tank from the samples.

The tank shall be filled with water at (15 ± 5) °C. The opening shall be closed with reinforced or metal caps.

Reinforced tanks shall be tested with their reinforcements.

〚A1〛 The tank shall be tested with five times the pressure resulting from the hydrostatic pressure based on the height of the tank. The test pressure shall be limited to 100 kPa for tanks with a maximum filling capacity of over 3 500 l. The test pressure shall be measured at the base of the tank. 〈A1〉

After the tank is filled the pressure shall be increased using a filling rate of 10 l/min up to the test pressure and shall be held at this pressure for 5 min. [1)]

1) The pressure may be increased up to bursting of the tank for additional information.

During the pressure increase the condition of the reinforcements shall be observed up to twice the hydrostatic pressure.

[A1] For tanks with a maximum filling capacity of over 3 500 l, a support framework which restrains the tank vertically between its base and its top is permitted during testing. The top part of the framework shall not support more than 20 % of the surface area of the top of the tank and the framework shall not restrain the deformation of the sides of the tank during testing. [A1]

## B.8 Leak tightness

All tanks (whether reinforced or not) shall be subjected to a pneumatic pressure of 30 kPa for at least 15 s or 10 kPa for at least 60 s.

## B.9 Water content (for polyamide 6 only)

The moisture content shall be determined in accordance with [A1] EN ISO 15512 [A1].

# Annex ZA
(informative)

# Clauses of this European Standard addressing essential requirements or other provisions of EU Directives.

## ZA.1 Scope and relevant characteristics

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

The clauses of this European Standard shown in this Annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the static thermoplastic tanks covered by this Annex for the intended uses indicated herein; reference shall be made to the information accompanying the CE marking.

**WARNING — Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the [construction products] falling within the scope of this European Standard.**

NOTE 1 In addition to any specific clauses relating to dangerous substances contained in this standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction web site accessed through

http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm.

This Annex establishes the conditions for the CE marking of the static thermoplastics tanks intended for the uses indicated in Tables ZA.1.1, ZA.1.2 and ZA.1.3 and shows the relevant clauses applicable:

This Annex has the same scope as Clause 1 of this standard and is defined by Tables ZA.1.1, ZA.1.2 and ZA.1.3.

**A1 Table ZA.1.1 — Relevant clauses for blow moulded polyethylene static tanks**

| **Product:** Blow moulded polyethylene static tanks<br>**Intended use:** Above ground storage of domestic heating oil, kerosene and diesel fuels for the supply of building heating/cooling systems. | | | |
|---|---|---|---|
| **Essential characteristics** | **Requirement clauses in this and other European Standards** | **Levels and/or classes** | **Notes** |
| **Mechanical resistance and stability** | | | |
| Mass | Table 4 | — | kg |
| Wall thickness | Table 4 | — | Pass/Fail |
| Melt flow rate | Table 1 | — | Pass/Fail |
| Density | Table 1 | — | Pass/Fail |
| Tensile strength | Table 1 | — | Pass/Fail |
| **Reaction to fire** | 4.1.2 | A1 to F | See EN 13501-1 |
| **Internal pressure**<br>Pressure resistance | Table 4 | — | Pass/Fail |
| **Impact resistance** | Table 4 | — | Pass/Fail |
| **Permeability**<br>-resistance to domestic heating oils, kerosene and diesel fuels | Table 1 | — | Pass/Fail |
| **Tightness**<br>Leak tightness | Table 4 | — | Pass/Fail |
| **Durability aspects:** | | | |
| 1. Durability of tensile strength after weathering | Table 1 | — | Pass/Fail |
| 2. Stress under pressure [elongation/deformation] | Table 4 | — | Pass/Fail |
| **Dangerous Substances** | 4.1.4 | | See Notes 1,2. |

**Table ZA.1.2 — Relevant clauses for rotationally moulded polyethylene static tanks**

| **Product:** Rotationally moulded polyethylene static tanks<br>**Intended uses:** Above ground storage of domestic heating oils, kerosene and diesel fuels for the supply of building heating/cooling systems | | | |
|---|---|---|---|
| **Essential characteristics** | **Requirement clauses in this and other European Standards** | **Levels and/or classes** | **Notes** |
| **Mechanical resistance and stability** | | | |
| Mass | Table 5 | — | kg |
| Wall thickness | Table 5 | — | Pass/Fail |
| Melt flow rate | Table 1 | — | Pass/Fail |
| Density | Table 1 | — | Pass/Fail |
| Tensile strength | Table 1 | — | Pass/Fail |
| **Reaction to fire** | 4.1.2 | A1 to F | See EN 13501-1 |
| **Internal pressure** | | | |
| Pressure resistance | Table 5 | — | Pass/Fail |
| **Impact resistance** | Table 5 | — | Pass/Fail |
| **Permeability** | | | |
| - Resistance to domestic heating oils, kerosene and diesel fuels | Table 1 | — | Pass/Fail |
| **Tightness** | | | |
| Leak tightness | Table 5 | — | Pass/Fail |
| **Durability aspects** | | | |
| 1. Durability of tensile strength after weathering | Table 1 | — | Pass /Fail |
| 2. Stress under pressure [elongation/deformation] | Table 5 | — | Pass /Fail |
| **Dangerous substances** | 4.1.4 | | See Notes 1,2 |

**Table ZA.1.3 — Relevant clauses for polyamide 6 static tanks**

| **Product:** Rotationally moulded Polyamide 6 static tanks<br>**Intended uses:** Above ground storage of domestic heating oils, kerosene and diesel fuels for the supply of building heating/cooling systems | | | |
|---|---|---|---|
| **Essential characteristics** | **Requirement clauses in this and other European Standards** | **Levels and/or classes** | **Notes** |
| **Mechanical resistance and stability**<br>Mass<br>Wall thickness<br>Tensile strength | <br>Table 6<br>Table 6<br>Table 1 | <br>—<br>—<br>— | <br>kg<br>Pass/Fail<br>Pass/Fail |
| **Reaction to fire** | 4.1.2 | A1 to F | See EN 13501-1 |
| **Internal pressure**<br>Pressure resistance | <br>Table 6 | <br>— | <br>Pass/Fail |
| **Impact resistance** | Table 6 | — | Pass/Fail |
| **Permeability**<br>- Resistance to domestic heating oils, kerosene and diesel fuels | Table 1 | — | Pass/Fail |
| **Tightness**<br>Leak tightness | Table 6 | — | Pass/Fail |
| **Durability aspects**<br>1. Durability of tensile strength after weathering<br>2. Stress under pressure [elongation/deformation] | <br>Table 1<br>Table 6 | <br>—<br>— | <br>Pass /Fail<br>Pass /Fail |
| **Dangerous substances** | 4.1.4 | | See Notes 1,2,. |

〈A1〉

The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option “No performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.



## ZA.2 Procedures for the attestation of conformity of static thermoplastic tanks

〈A1〉

### ZA.2.1 Systems of attestation of conformity

The systems of attestation of conformity of the static thermoplastic tanks indicated in Tables ZA.1.1 to ZA.1.3, in accordance with EU Decision 1999/472/EC (OJEU L184 of 17.7.1999) as amended by EU Decision 2001/596/EC (OJEU L209 of 2.8.2001) as given in Annex III of the mandate for "Pipes, tanks and ancillaries not in contact with water intended for human consumption", are shown in Table ZA.2 for the indicated intended uses and relevant classes.

**Table ZA.2 — System(s) of attestation of conformity**

| Products | Intended use(s) | Level(s) or class(es) | Attestation of conformity systems |
|---|---|---|---|
| Tanks | In installations for the transport/distribution/storage of gas/fuel intended for the supply of building heating/cooling systems, from the external storage reservoir or the last pressure reduction unit of the network to the inlet of the heating/cooling systems of the building | — | 3 |
| | In installations in areas subject to reaction to fire regulations, used for the transport/distribution/storage of gas/fuel intended for the supply of building heating/cooling systems, from the external storage reservoir or the last pressure reduction unit of the network to the inlet of the heating/cooling systems of the building | Any | 1 |
| System 1: See Directive 89/106/EEC (CPD) Annex III.2.(i), without audit testing of samples.<br>System 3: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Second possibility. | | | |

The attestation of conformity of the static thermoplastic tanks indicated in Tables ZA.1.1, ZA.1.2 and ZA.1.3 shall be according to the evaluation of conformity procedures indicated in Table ZA.3.1 or Table ZA.3.2 resulting from the application of the clauses of this European Standard indicated therein.

**Table ZA.3.1 — Assignment of evaluation of conformity tasks for tanks under system 1**

| Tasks | | Content of the task | Evaluation of conformity clauses to apply |
|---|---|---|---|
| Tasks under the responsibility of the manufacturer | Factory production control (FPC) | Parameters related to all essential characteristics of Table ZA.1.1 to ZA.1.3 relevant for the intended use which are declared. | 5.3 |
| | Further testing of samples taken at factory according to the agreed test plan | Essential characteristics of Table ZA.1.1 to ZA.1.3 relevant for the intended use which are declared | 5.3 |
| Tasks under the responsibility of the product certification body | Initial type testing | Essential characteristics relevant for the intended use | 5.2 |
| | Initial inspection of factory and of FPC | Parameters related to essential characteristics of Table ZA.1.1 to ZA.1.3, relevant for the intended use, which are declared. Documentation of the FPC | 5.3 |
| | Continuous surveillance, assessment and approval of FPC | Parameters related to essential characteristics of Table ZA.1.1 to ZA.1.3, relevant for the intended use, which are declared. Documentation of the FPC | 5.3 |

**Table ZA.3.2 — Assignment of evaluation of conformity tasks for tanks under system 3**

| Tasks | | Content of the task | Evaluation of conformity clauses to apply |
|---|---|---|---|
| Tasks under the responsibility of the manufacturer | Factory production control (FPC) | Parameters related to essential characteristics of Table ZA.1.1 to ZA.1.3, relevant for the intended use which are declared | 5.3 |
| Tasks under the responsibility of the notified body | Initial type testing | All essential characteristics of Table ZA.1.1 to ZA.1.3, relevant for the intended use | 5.2 |



### ZA.2.2 EC Certificate and Declaration of conformity

**For products under system 1**

When compliance with the conditions of this annex is achieved, the certification body shall draw up the EC Certificate of Conformity, which entitles the manufacturer to affix the CE marking. The EC certificate of conformity shall include:

- name, address and identification number of the certification body,

- name and address of the manufacturer, or his authorised representative established in the EEA, and place of production,

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

- description of the product (type, identification, use, ...),
- provisions to which the product conforms (i.e. Annex ZA of this EN),
- particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions),
- the number of the certificate,
- conditions of validity of the certificate, where applicable,
- name of, and position held by, the person empowered to sign the certificate.

**For products under systems 3**

When compliance with the conditions of this annex is achieved, the manufacturer or his agent established in the EEA shall draw up and retain the EC Declaration of Conformity, which entitles the manufacturer to affix the CE marking. This EC declaration of conformity shall include:

- name and address of the manufacturer, or his authorised representative established in the EEA, and place of production,

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

- description of the product (type, identification, use,...), and a copy of the information accompanying the CE marking,

NOTE 2 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

- provisions to which the product conforms (i.e. Annex ZA of this EN), and a reference to the ITT report(s) and factory production control records (if appropriate),
- particular conditions applicable to the use of the product, (e.g. provisions for use under certain conditions),
- name and address of the notified laboratory(ies),
- name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative. ⟨A1⟩



## ZA.3 CE Marking and labelling

⟨A1⟩ The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC. For products under system 1 the CE symbol, the number of the certification body, the reference to this standard and the last two digits of the year of affixing the CE symbol shall be shown on the product. For products under system 3 the CE symbol, the reference to this standard and the last two digits of the year of affixing the CE symbol shall be shown on the product. ⟨A1⟩

The following information shall accompany the CE marking symbol:

— name or identifying mark and registered address of the producer;

— [A1] identification number of the notified certification body (for system 1 only); [A1]

— the last two digits of the year in which the marking is affixed (reference may be made to the date of manufacture of the product);

— reference to EN 13341;

— description of the product: Above ground (internal or external)/(internal only) storage of domestic heating oil, diesel fuels and/or kerosene;

— information on those relevant essential characteristics listed in Tables ZA.1.1, ZA.1.2 or ZA.1.3 which are to be declared: wall thickness (minimum wall thickness); mass; reaction to fire; impact resistance; pressure resistance; leaktightness; resistance to weathering; resistance to oil and elongation/deformation.

— declared values and, where relevant, level or class (including “pass” for pass/fail requirements, where necessary) to declare for each essential characteristic as indicated in "Notes" in Table ZA.1;

— “No performance determined” for characteristics where this is relevant.

The “No performance determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

[A1] Figures ZA.1 to ZA.4 give examples of the information to be given on the product, label, packaging and/or commercial documents where the tank is for external use. Similar information shall be given for each tank type. [A1]

A1

| | |
|---|---|
| CE<br>01234 | *CE marking, consisting of the "CE"-symbol given in Directive 93/68/EC*<br>*Identification number of the certification body* |
| **09** | *Last two digits of the year in which the marking was affixed* |
| **EN 13341** | *No. of European Standard* |

**Figure ZA.1. — Example CE marking for products under system 1, information to be shown on the tank**

| | |
|---|---|
| CE<br>01234 | *CE marking, consisting of the "CE"-symbol given in Directive 93/68/EC*<br>*Identification number of the certification body* |
| **AnyCo Ltd, PO Box 21, B-1050**<br><br>**09**<br><br>01234-CPD 00234 | *Name or identifying mark and registered address of the producer*<br>*Last two digits of the year in which the marking was affixed*<br>*EC Certificate number* |
| **EN 13341**<br>1 500 litre blow moulded polyethylene static tank for the above ground external or internal storage of domestic heating oils, kerosene and diesel fuels<br><br>**Mechanical resistance and stability:**<br>- Mass XXX kg<br>- Wall thickness 3,5 mm<br>- Melt Flow Rate (except for PA tanks) Pass<br>- Density (except for PA tanks) Pass<br>- Tensile strength Pass<br>**Reaction to fire** F<br>**Internal pressure**:<br>- Pressure resistance Pass<br>**Impact resistance** Pass<br>**Permeability:**<br>Resistance to domestic heating oil, kerosene and diesel fuels Pass<br>**Tightness:**<br>- Leak tightness Pass<br>**Release of dangerous substances**: Notes 1 and 2<br>**Durability:**<br>- of tensile strength after weathering (internal/external) Pass<br>- stress under pressure (elongation/deformation) Pass | *No. of European Standard*<br><br>*Description of product*<br><br>*Information on essential characteristics* |



**Figure ZA.2 — Example CE marking for products under system 1, information on the commercial documents**

| | |
|---|---|
| CE | *CE marking, consisting of the "CE"-symbol given in Directive 93/68/EC* |
| **09** | *Last two digits of the year in which the marking was affixed* |
| **EN 13341** | *No. of European Standard* |

**Figure ZA.3 — Example CE marking for products under system 3, information to be shown on the tank**

| | |
|---|---|
| CE | *CE marking, consisting of the "CE"-symbol given in Directive 93/68/EC* |
| **AnyCo Ltd, PO Box 21, B-1050**<br><br>**09** | *Name or identifying mark and registered address of the producer*<br>*Last two digits of the year in which the marking was affixed* |
| **EN 13341**<br>1 500 litre blow moulded polyethylene static tank for the above ground external or internal storage of domestic heating oils, kerosene and diesel fuels<br><br>**Mechanical resistance and stability:**<br>- Mass XXX kg<br>- Wall thickness 3,5 mm<br>- Melt Flow Rate (except for PA tanks) Pass<br>- Density (except for PA tanks) Pass<br>Tensile strength Pass<br>**Reaction to fire** F<br>**Internal pressure:**<br>- Pressure resistance Pass<br>**Impact resistance** Pass<br>**Permeability:**<br>- Resistance to domestic heating oil, kerosene and diesel fuels Pass<br>**Tightness:**<br>- Leak tightness Pass<br>**Release of dangerous substances**: Notes 1 and 2<br>**Durability:**<br>- of tensile strength after weathering (internal/external) Pass<br>- stress under pressure (elongation/deformation) Pass | *No. of European Standard*<br><br>*Description of product*<br><br>*Information on essential characteristics* |



**Figure ZA.4 — Example CE marking for products under system 3, information on the commercial documents** A1

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other

legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

[A1] NOTE 1 [A1] European legislation without national derogation's need not be mentioned.

[A1] NOTE 2 Affixing the CE marking symbol means, if a product is subject to more than one directive, that it complies with all applicable directives. [A1]

# Bibliography

[1] EN ISO 2719, *Determination of flash point — Pensky-Martens closed cup method (ISO 2719:2002)*

[2] EN ISO 9001, A1 *Quality management systems — Requirements (ISO 9001:2008)* A1