
Zunanje sveče - Specifikacija za požarno varnost

Outdoor candles - Specification for fire safety

Kerzen für den Außenbereich - Spezifikation für die Feuersicherheit

Bougies d'extérieur - Spécifications relatives à la sécurité incendie

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97.180	Razna oprema za dom in trgovino	Miscellaneous domestic and commercial equipment

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Outdoor candles - Specification for fire safety

Bougies d'extérieur - Spécifications relatives à la
sécurité incendie

Kerzen für den Außenbereich - Spezifikation für die
Feuersicherheit

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European foreword

This document (prEN 17616:2020) has been prepared by Technical Committee CEN/TC 369 “Candle fire safety”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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Introduction

Candles have accompanied mankind for more than 2 000 years serving above all as a light source. Closely connected to the development history of the candle are the efforts made to improve its quality and its safety in use. Fires caused by unsafe candles and/or inappropriate use during the burning of candles have led to consumer concern for these issues.

This document helps to ensure a reasonable degree of safety during use, thereby improving personal safety and reducing the risk of fires, deaths and injuries.

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1 Scope

This document specifies requirements and test methods for the fire safety of candles intended to be burned outdoors.

Sticks wrapped with fuel-soaked materials, such as paper, cardboard or fabric, oil lamps on a stick and products intended to be used professionally to protect vineyards or fruit orchards from frost damages are not covered by this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

prEN 17617:2020, *Outdoor candles - Product safety labels*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

burning period

time the candle burns from being lit initially until it is extinguished

[SOURCE: EN 15493:2019, 3.3]

3.2

burn test cycle

total time of a burning period and pause

[SOURCE: EN 15493:2019, 3.4]

3.3

candle

one or more combustible wicks supported by a material that constitutes a fuel, which is solid or semisolid at room temperature (20 °C to 27 °C) with the main function of sustaining a light-producing flame, including any coatings on and articles or substances in the fuel

[SOURCE: EN 15426:2018, 3.2]

3.4

container candle

candle that is produced and used in the same container

Note 1 to entry: The material of the container can be e.g. ceramic, concrete, glass, metal, plastic or any bi-component material for example.

[SOURCE: EN 15426:2018, 3.3, modified – Note 1 “This definition includes tea lights” is replaced]

prEN 17616:2020 (E)**3.5****flame height**

base of the flame to the top of the flame

[SOURCE: EN 15493:2019, 3.7]

3.6**flare-up**

condition where the vapours of the base material ignite over the entire fuel pool

3.7**floating candle**

candle intended and designed for use in a suitable bowl or container filled with water

[SOURCE: EN 15493:2019, 3.8]

3.8**freestanding candle**

candle that is designed to be used without a supporting holder

[SOURCE: EN 15426:2018, 3.4]

3.9**garden torch**

stick with a candle fixed on top which is planted in the ground or set up in a stable manner with a support

Note 1 to entry: Sticks wrapped with fuel-soaked materials such as paper, cardboard or fabric as well as oil lamps on a stick are not considered as garden torches.

3.10**grave light**

container candle intended to be used unattended only at cemeteries on or close to graves

Note 1 to entry: Usually, a wind protection like a lid is present to prevent extinguishing or without lid when intended to be placed in a lantern.

3.11**outdoor candle**

candle intended and designed to be used outside buildings in the open air

4 Safety requirements**4.1 Container candles**

4.1.1 The candle shall not tip over when tested on a slope of $(10 \pm 0,2)^\circ$ according to 9.2.

4.1.2 The wind resistance shall have a value > 1 when calculated according to 9.6.

NOTE A wind velocity of 3 m/s is used for the calculation.

Container candles that do not comply may still be marketed if they show appropriate safety information (see prEN 17617:2020, Figure 10).

If the requirement is not met it is recommended that appropriate sturdy stands in which the candles can be placed are offered for sale in conjunction with the candles.

4.1.3 The temperature at the surface below the container shall not exceed 350 °C when tested according to 9.4.

The temperature limit is supposed to avoid fire if containers are burned on a wood surface without a heat resistant base, not to avoid damage to the surface. If the objective is to avoid damage to the surface, e.g. scorch marks, the manufacturer should aim for much lower temperatures.

4.1.4 No secondary ignition shall occur for more than 10 s, when the candle is burning according to 9.3. At the end of burning, when there is only a small amount of molten base material left, there may be a flare-up for maximum 5 min, provided that this does not pose any risk to the surroundings.

4.1.5 The container shall not ignite or break when tested according to 9.3.

4.1.6 The container shall not burn for longer than 15 s on average and 30 s in any individual test when tested according to 9.5. The container shall not be completely burned away during testing.

NOTE The clamped part of the container is not taken into account to evaluate complete burning away. Containers constructed exclusively of non-combustible materials (e.g. ceramic, metal, glass, terracotta) are assumed to fulfil the requirement without testing.

Containers of grave lights are exempted from this requirement provided that they show clear indication that they are only intended to be used at cemeteries (see prEN 17617:2020, Figure 8).

4.1.7 After extinguishing, the candle shall not spontaneously re-light.

4.2 Freestanding candles

4.2.1 Freestanding candles shall not tip over when tested on a slope of $(10 \pm 0,2)^\circ$ according to 9.2.

4.2.2 No secondary ignition shall occur for more than 10 s when the candle is burning according to 9.3.

4.2.3 After extinguishing, the candle shall not spontaneously re-light.

4.3 Garden torches

4.3.1 Garden torches shall be designed to be set up and stay in a stable manner.

4.3.2 No secondary ignition shall occur for more than 10 s when the garden torch is burning according to 9.3.

4.3.3 No burning or smoldering material shall fall from garden torches. The garden torch shall neither burn paper placed underneath nor cause any scorch marks on it during the whole burning test according to 9.3.

NOTE Dripping base material that does not burn is not considered.

4.3.4 The candle placed on a stick shall also meet the requirements relevant for the respective candle type, except stability (see 4.1 and 4.2).

4.4 Floating candles

4.4.1 No secondary ignition shall occur for more than 10 s when the candle is burning according to 9.3.

4.4.2 After extinguishing, the candle shall not spontaneously re-light.

5 Test equipment and apparatus

5.1 Incline plane (fixed or adjustable) with an angle of $(10 \pm 0,2)^\circ$ from a horizontal level.

5.2 Measuring device, non-flammable with millimetre grading.

5.3 Stop watch

5.4 Brick, solid with a density of $(2\,000 \pm 200)$ kg/m³.

NOTE The specific heat capacity of a burnt brick is about 900 J/(kg K) and the thermal conductivity is about 0,35 W/(m K).

5.5 Thermocouple, class 1 K-type thermocouple, thickness 0,5 mm.

5.6 Data collector, computer controlled data logger capable of recording the temperature in intervals of max. 30 s.

5.7 Clamp, non-flammable.

5.8 Flame source, a post mix butane/propane stick lighter capable of producing a flame with a height of (40 ± 5) mm and width of (6 ± 1) mm.

The blue flame part should be approximately 10 mm in height.

5.9 Calliper, non-flammable with millimetre grading.

5.10 Oven, capable of reaching a minimum temperature of 75 °C.

5.11 Camera.

6 Sampling

The test shall be carried out on finished candles representative of those intended to be supplied commercially.

For tests according to 9.2, 9.3 and 9.4, for the test result to represent a specific candle type, a minimum of 3 samples shall be tested.

For tests according to 9.5, for the test result to represent a specific candle type, a minimum of 5 samples shall be tested.

7 Sample preparation

7.1 For test according to 9.2, 9.3 and 9.4, remove any outer wrapping and label material and prepare the sample for use according to the manufacturer's instructions, if any given, e.g. trim the wick. If the candle is sold together with a holder or other accessories it shall be tested in the intended combination. For identification of the sample, measure the dimension and the mass of the candle. The temperature of the sample shall be (20 ± 5) °C before the test is started.