
**Naprave za napihovanje in pripomočki za napihljive potrošniške proizvode - 2. del:
Varnostne zahteve, trajnost, ustreznost, združljivost in preskusne metode za
naprave za zračne tlačilke**

Inflation devices and accessories for inflatable consumer products - Part 2: Safety requirements, durability, performance, compatibility and test methods of inflators

Pumpen und Pumpenzubehör für aufblasbare Verbraucherartikel - Teil 2:
Sicherheitstechnische Anforderungen, Dauerhaltbarkeit, Gebrauchstauglichkeit,
Kompatibilität und Prüfverfahren für Pumpen

Pompes et accessoires pour des produits gonflables destinés aux consommateurs -
Partie 2: Exigences de sécurité, durabilité, performances, compatibilité et méthodes d'
essais des gonfleurs

Ta slovenski standard je istoveten z: EN 16051-2:2012

ICS:

97.220.01	Športna oprema in pripomočki na splošno	Sports equipment and facilities in general
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 NORME EUROPÉENNE
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Inflation devices and accessories for inflatable consumer products - Part 2: Safety requirements, durability, performance, compatibility and test methods of inflators

Dispositifs et accessoires de gonflage pour biens de consommation gonflables - Partie 2: Exigences de sécurité, durabilité, performances, compatibilité et méthodes d'essai des gonfleurs

Pumpen und Pumpenzubehör für aufblasbare Verbraucherartikel - Teil 2: Sicherheitstechnische Anforderungen, Dauerhaltbarkeit, Gebrauchstauglichkeit, Kompatibilität und Prüfverfahren für Pumpen

This European Standard was approved by CEN on 29 October 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Turkey and United Kingdom.



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Foreword

This document (EN 16051-2:2012) has been prepared by Technical Committee CEN/TC 136 "Sports, playground and other recreational facilities and equipment", 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 2012, and conflicting national standards shall be withdrawn at the latest by July 2012.

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.

EN 16051, *Inflation devices and accessories for inflatable consumer products*, consists of the following parts:

- *Part 1: Compatibility of valves and valve adapters*
- *Part 2: Safety requirements, durability, performance, compatibility and test methods of inflators*

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, Turkey and United Kingdom.

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EN 16051-2:2012 (E)**Introduction**

The process of inflating a floating leisure article should be considered in two ways:

- a) the device for inflating the product, a pump;
- b) the compatibility between the pump and the valve or valves on the product itself.

This standard, EN 16051, is in two parts and addresses the performance, safety requirements, durability and test methods that should be applied to the pump and the compatibility between a pump and the device to be inflated to ensure that the inflation process can be conducted efficiently and safely.

Unless a device is supplied and sold with a pump, by the manufacturer, where it is reasonable to expect the pump to be compatible with the product, there is generally a requirement to have an adaptor between a pump and the device valves to ensure that the air hose or other connector fits into or onto the valves on the device.

This part of the standard, Part 2, addresses the requirements for the safe performance of the pump when it is being used to inflate the device.

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1 Scope

This document specifies safety requirements, performance requirements and requirements for marking and labelling of air pumps for inflatable consumer articles including the adapter side interface geometry between pump adapters and valves for inflatable consumer articles.

This document does not apply for complete pumps (including tubes and adapters) for inflation and deflation sold together with the appropriate consumer article as a set.

This document is not applicable to electrical inflators.

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 16051-1:2012, *Inflation devices and accessories for inflatable consumer products — Part 1: Compatibility of valves and valve adapters*

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16051-1:2012 apply.

4 Air pumps

4.1 Types of air pumps

Air pumps are classified in types as shown below (examples see Figures 1 and Figure 2):

a) Type H, hand-operated air pump;

EXAMPLE 1

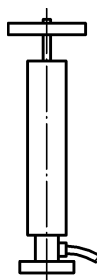


Figure 1 — Hand operated air pump, type H, example

b) Type F foot-operated air pump.

EXAMPLE 2

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Figure 2 — Foot operated air pump, type F, example

4.2 Requirements and test methods

4.2.1 General

If not otherwise stated air pumps shall be tested appropriately in accordance with their individual functions and properties.

All test related to pressure and displaced volume shall be performed at an ambient temperature of $(20 \pm 3)^\circ\text{C}$.

4.2.2 Safety requirements

There shall be no sharp corners or edges. Where the pump mechanism form shear and pinch points safety distances in accordance with EN ISO 13857 shall be applied.

4.2.3 Nominal pressure

4.2.3.1 Requirements

The maximum force to achieve the rated nominal air pressure shall not exceed 600 N for hand and foot operated air pumps.

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The interface of connecting parts (e. g. tube between valve and pump) shall be designed in a way that they do not become loose or defect when the allowed maximum pressure of the pump is applied.

4.2.3.2 Testing

The achievable pressure shall be measured at the interface to the article when the pump is normally operated up to a maximum force of 600 N.

For testing the adhesion of interface points any article of the appropriate pressure class shall be applied for testing. The article shall be inflated to the rated nominal pressure and checked for continuous adhesion of connecting points by visual inspection. This procedure shall be repeated ten times.

After complete compression air pumps of type F shall reset to their initial position within 3 s when tested at an ambient temperature of $(20 \pm 3) ^\circ\text{C}$.

4.2.4 Operational reliability**4.2.4.1 Requirements**

Air pumps shall perform appropriately after being submitted to the durability test (4.2.4.2.1).

When tested for static strength in accordance with 4.2.4.2.2 there shall be no deformation or brake of the operating element (e. g. handle or foot plate).

4.2.4.2 Testing

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4.2.4.2.1 Durability test

A total of 5 000 cycles shall be applied. Cycles shall be subdivided by applying:

- 4 000 cycles at 1/3 of rated nominal pressure, <https://standards.iteh.ai/catalog/standards/sist/ba32a3d2-b2c4-413e-968e-58f80b/sist-en-16051-2-2012>
- 1 000 cycles at rated nominal pressure.

Action is performed against the relevant specified pressure by executing the maximum cycle length of the pump.

When tested to the 1/3 nominal pressure cycle action shall be stopped for cooling down (to room temperature) after every 500th cycle and after every 50th cycle when tested to nominal pressure.

50 % of the cycles shall be executed on a surface with an inclination of 5°.

4.2.4.2.2 Static strength

Hand operated air pumps shall be loaded vertically with a quasi-static force of 600 N for a period of 10 s. The force shall be equally distributed to both parts of the handle and applied at the middle of each handle length.

Foot operated pumps shall be loaded vertically with a quasi-static force of 750 N for a period of 10 s. The load shall be applied via a loading pad of 50 mm diameter at the centre line of the foot plate. The distance from the edge opposite the pivoting point shall be 1/3 of length of the foot plate. For air pumps without a hinge the load shall be applied at the centre point of the foot plate.

4.2.5 Displaced volume against atmospheric pressure

4.2.5.1 Requirement

The rated displaced volume shall comply to the real displaced volume, if the pumps are loaded with 600 N respectively with 750 N.

4.2.5.2 Testing

The air pump shall be filled with water and operated under water. The amount of water pumped out of the pump per cycle shall be measured and evaluated as intermediate displaced volume.

The final displaced volume is calculated as the mean value of 10 cycles.

For double stroke pumps the displaced volume is calculated by considering each active stroke.

4.2.6 Adapters and interface dimensions

See requirements and dimensions in Clause 5.

4.3 Marking and labelling

Air pumps shall have a type plate providing the data below:

- manufacturer and/or distributor;
- nominal displaced volume in l per stroke and/or cycle;
- nominal pressure in bar.

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Compliance of air pumps with this standard may be expressed by the manufacturer in his own responsibility (self declaration) with reference to this standard.

5 Adapter for plug valves and valve/pump connection with twist lock closure

The typical adapter for connecting the pump with the plug valves of the respective reference sizes "small/medium/ large" (see EN 16051-1:2012, Table 2 and Figure 2) shall have the external dimension as shown in Figure 3: