



**SLOVENSKI STANDARD**  
**oSIST prEN 17957:2023**

**01-april-2023**

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**Hlapni proizvodi - Režim uparjanja za izdelke, namenjene neposrednemu vdihavanju v pljuča**

Vapour products - Vaping regime for products intended to be used for direct to lung inhalation

Dampfprodukte - Dampf-Verfahren von Produkten, die für die direkte Inhalation in die Lunge bestimmt sind

Produits de vapotage - Régime de vapotage destiné à l'inhalation directe

Ta slovenski standard je istoveten z: **prEN 17957**

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**ICS:**

65.160	Tobak, tobačni izdelki in oprema	Tobacco, tobacco products and related equipment
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**oSIST prEN 17957:2023**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 17957**

February 2023

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ICS 65.160

English Version

## Vapour products - Vaping regime for products intended to be used for direct to lung inhalation

Produits de vapotage - Régime de vapotage destiné à l'inhalation directe

Dampfprodukte - Dampf-Verfahren von Produkten, die für die direkte Inhalation in die Lunge bestimmt sind

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 437.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (prEN 17957:2023) has been prepared by Technical Committee CEN/TC 437 “Electronic cigarettes and e-liquids”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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## Introduction

This document has been developed to define an additional vaping regime and to specify its conditions of application. Also, EN ISO 20768 describes inhalation of aerosol by filling the mouth before inhaling deeper into the lung, commonly called mouth to lung vaping.

This additional regime is aimed to be representative of an inhalation through an electronic cigarette into the lung, commonly called direct to lung inhalation.

Due to the poor literature about puff topography of direct to lung vaping device users, this vaping regime is based on physical lung properties and resting conditions. Puff volume is consistent with the tidal volume (500 mL), the puff duration with a respiration rate of 12 breaths per minute (i.e. inhalation duration of 2,5 s) leading to an average airflow rate estimated at 200 mL/s.

The methods exploring 25 devices, leading the technical characteristics used as criteria of application, can be found in Soulet et al. (2021) [1].

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## 1 Scope

This document:

- Defines a vaping regime for products suitable for use for a specific user inhalation behaviour: the direct to lung inhalation;
- Defines guidelines on when a direct to lung vaping regime should be used;
- Specifies technical requirements of the vaping device to be verified to use this regime;
- Specifies standard conditions and the profile of inhalation to be used for a direct to lung vaping regime.

## 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.

EN ISO 20768, *Vapour products - Routine analytical vaping machine - Definitions and standard conditions (ISO 20768)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20768 and the following apply.

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

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

### 3.1

#### vaping device

product that vaporizes liquid to generate an inhalable aerosol carried by air drawn through the device by the user

### 3.2

#### air-flow port

hole present on vaping device allowing the airflow through vaping device when user inhales

Note 1 to entry: Depending on the vaping device, the air-flow port can be adjustable.

### 3.3

#### pressure drop

static pressure difference between the vaping device air-flow port and the mouthpiece exits when it is traversed by an airflow under steady conditions as described in EN ISO 20768

### 3.4

#### puff duration

interval of time, measured in seconds, during which the port of the machine is pneumatically connected to the suction mechanism

**prEN 17957:2023 (E)****3.5****puff period**

time between the start of one puff and the start of the subsequent puff

[SOURCE: EN ISO 20768:2021, 3.5]

**3.6****puff volume**

volume drawn by the machine at the mouth end of the vapour product

[SOURCE: EN ISO 20768:2021, 3.3]

**3.7****producer**

manufacturer of any e-liquid-containing product, e-liquid component, e-liquid ingredient or related packaging or accompanying documents (e.g. leaflet), supplied to a consumer, whereby the manufacturer, by importing and/or putting its name, trademark or other distinguishing feature on the product presents itself as the entity legally responsible for the item within the relevant jurisdiction

**3.8****air-resistance**

coefficient ( $R_a$ , in  $\text{Pa}^{0,5} \text{ min L}^{-1}$ ) of the linear trend linking the square root of pressure drop generated by a vaping device ( $\Delta P$ , in Pa) to the airflow rate ( $Q$ , in  $\text{L}/\text{min}^{-1}$ ), determined by the following relation:

$$R_a = \frac{\sqrt{\Delta P}}{Q}$$

**4 Direct- lung vaping regimen use condition** 17957:2023

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Direct-to-lung vaping regime shall be used with a device when the user product information from the producer indicates it is suitable or recommended for direct to lung usage.

Devices can be suitable for both direct to lung and mouth to lung vaping. In that case, the testing regime (see EN ISO 20768) shall be applied alongside the regime specified here and operating parameters shall be justified.

Air-flow ports shall be fully open when they are adjustable.

Direct to lung vaping regimen should be used if a device has at least a combination of an air-resistance maximum of  $6,6 \text{ Pa}^{0,5} \cdot \text{min} \cdot \text{L}^{-1}$  and one of the following technical characteristics: power minimum of 23 W, an electrical resistance maximum 0,6  $\Omega$  based on the producer's information.

Annex A provides some information related to the choice of these parameters.

NOTE Direct to lung vaping by consumers mostly uses high glycerol and low nicotine content e-liquids.

**5 Reference conditions****5.1 Puff duration**

The puff duration shall be  $2,5 \text{ s} \pm 0,1 \text{ s}$ .

**5.2 Puff volume**

The puff volume shall be  $500,0 \text{ mL} \pm 6 \text{ mL}$ .



### 5.3 Puff period

The puff period shall be  $60,0 \text{ s} \pm 1,0 \text{ s}$ .

### 5.4 Puff profile

The volume  $V_1$  plus  $V_3$  of the increasing and decreasing parts of the profile shall not exceed 10 % of the total puff volume  $V_1 + V_2 + V_3$ . The maximum flow rate shall be  $200 \text{ mL/s} \pm 20 \text{ mL/s}$  (see Figure 1).

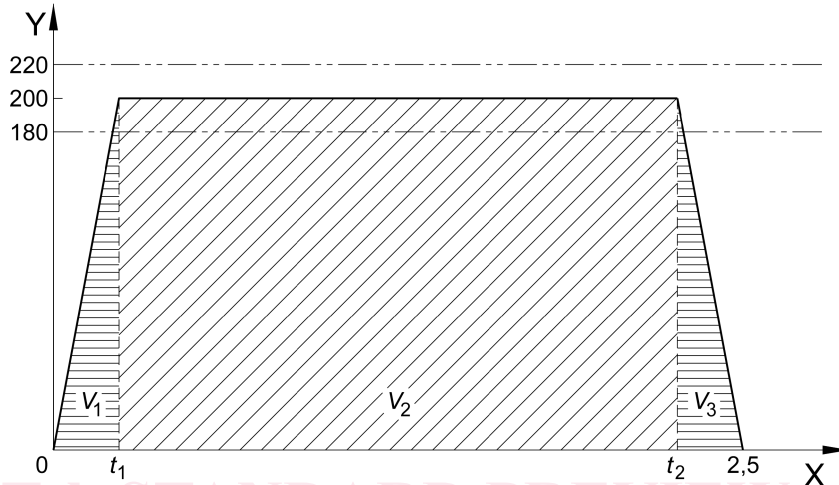


Figure 1 — Puff profile (idealized)

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## Annex A (informative)

### Determination of technical characteristics

The determination of technical characteristics is based on the scientific study reported in [1]. In this study, 25 electronic cigarettes and atomizers were selected as a representative sample of the products available in the market and were tested. The electrical resistance, power range, inhalation behaviour and air resistance determined are listed in Table A.1 (material and methods are described [1]). Commercial names have been anonymized according to CEN rules.

**Table A.1 — List of the 25 tested devices**

Commercial Name	Resistance ( $\Omega$ )	Power range (W)	Inhalation behaviour	Air resistance ( $\text{Pa}^{0,5}/(\text{L}/\text{min})$ )
Device 1	1,8	9,1	N/A	31,8
Device 2	1,5	9,1	MTL	39,1
Device 3	1,8	7,6	N/A	25,6
Device 4	1,8	7,6	N/A	28,2
Device 5	1,6	8,5	N/A	15,5
Device 6	1,5	9,1	MTL	20,1
Device 7	1,8	5-14	N/A	27,2
Device 8	1,6	8-12	MTL	17,2
Device 9	1,8	10-14	MTL	13,0
Device 10	1,6	10-14	MTL	10,8
Device 11	1,5	8-20	MTL-DL	9,2
Device 12	1,5	14	MTL	10,4
Device 13	1,0	10-25	MTL-DL	10,6
Device 14	0,7	6-30	MTL	10,3
Device 15	0,7	15-23	MTL-DL	14,8
Device 16	0,5	30-100	DL	2,5
Device 17	0,5	20-35	DL	2,0
Device 18	0,4	40-60	DL	1,2
Device 19	0,4	15-60	DL	1,0
Device 20	0,4	60-70	DL	1,3
Device 21	0,2	40-70	DL	1,0
Device 22	0,2	80	DL	1,0
Device 23	0,15	50-160	DL	1,2
Device 24	0,5	15-60	DL	4,1
Device 25	0,15	40-90	DL	1,0