

Alcohol interlocks - Test methods and performance requirements - Part 1: Instruments having a mouthpiece and measuring breath alcohol for drink-driving-offender programs and general preventive use

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50436-1:2023 sisaldab Euroopa standardi EN 50436-1:2023 ingliskeelset teksti.	This Estonian standard EVS-EN 50436-1:2023 consists of the English text of the European standard EN 50436-1:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 14.07.2023.	Date of Availability of the European standard is 14.07.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 43.040.10, 71.040.40

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis-ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis-ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Alcohol interlocks - Test methods and performance requirements
- Part 1: Instruments having a mouthpiece and measuring breath
alcohol for drink-driving-offender programs and general
preventive use

Ethylotests antidémarrage - Méthodes d'essais et
exigences de performance - Partie 1: Appareils équipés
d'un embout qui mesurent le taux d'alcoolémie dans l'air
expiré, pour programmes de lutte contre la conduite en état
d'ivresse et à usage préventif général

Alkohol-Interlocks - Prüfverfahren und Anforderungen an
das Betriebsverhalten - Teil 1: Geräte mit Mundstück zur
Messung des Atemalkohols für Programme mit
Trunkenheitsfahren und für den allgemein-präventiven
Einsatz

This European Standard was approved by CENELEC on 2023-06-19. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Contents

Page

European foreword	5
Introduction	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	9
4 General requirements	12
4.1 Blocking and not-blocking	12
4.2 Influence on the vehicle motor	12
4.3 Tampering	12
4.4 Concentration limit	12
4.5 Mouthpiece	12
4.6 Ready for test	12
4.7 Data memory, download and data protection	12
4.8 Retest	13
4.9 Recall	13
4.10 Override and bypass	13
4.11 Combination with other systems	13
4.12 Communication integrity	14
4.13 Wireless communication	14
4.14 User Interface	14
5 General test methods	14
5.1 Devices under test	14
5.2 Preparation of alcohol interlock before testing	15
5.3 Sequence of tests	15
5.3.1 Alcohol interlock	15
5.3.2 Accessory devices	15
5.4 Normal conditions for tests	15
5.5 Functional test	16
6 Electrical tests	17
6.1 General	17
6.2 Supply voltage	17
6.3 Excess supply voltage	17
6.4 Short-circuit	17
6.5 Reversed polarity	18
6.6 Low-power-consumption state	18

6.7	Electrical disturbances	18
6.7.1	General	18
6.7.2	Supply lines	18
6.7.3	Lines other than supply lines	19
6.8	Electrostatic discharge	19
6.9	Electromagnetic compatibility	19
6.10	Functional test under normal conditions	19
7	Calibration curve	19
8	Durability tests	20
8.1	Temperature cycles	20
8.2	Condensed water	20
8.3	Vibrations	20
8.4	Drop test	20
9	Environmental tests	20
9.1	General	20
9.2	Temperature	21
9.3	Temperature and supply voltage	21
9.4	Temperature and humidity	21
9.5	Warm-up time	22
9.5.1	Temperature 20 °C	22
9.5.2	Temperature -5 °C	22
9.5.3	Temperature -20 °C	22
9.6	Pressure	23
9.7	Protection by enclosure	23
10	Breath sample	23
10.1	Volume	23
10.2	Flow	23
10.3	Exhalation time	24
10.4	Response time	24
11	Analytical specificity	24
11.1	Test gases	24
11.2	Cigarette smoke	25
12	Manipulation and circumvention	25
12.1	General	25
12.2	Pressurized air	25
12.3	Providing the sample with a mouthpiece attached	25
12.4	Providing the sample without a mouthpiece attached	26
12.5	Obstruction of the mouthpiece	26
12.6	Filter	27

12.6.1	Tube Filter	27
12.6.2	Disc Filter	27
12.7	Condensation	27
12.8	Water	27
12.9	Putting out of service	27
12.10	Removal of handset	28
12.11	Bypass	28
13	Timer	28
13.1	General	28
13.2	Start period	29
13.3	Restart period	29
13.4	Service reminder	29
13.5	Calibration interval	29
14	Long term behaviour	29
15	Instructions	30
15.1	Instructions for installation	30
15.2	Instructions for use	31
15.3	Instructions for servicing the alcohol interlock	31
16	Test report	32
17	Labelling and marking	32
Annex A (normative) Description of events		33
Annex B (informative) Performance testing		37
Bibliography		38

European foreword

This document (EN 50436-1:2023) has been prepared by CLC/BTTF 116-2 "Alcohol Interlocks".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-06-19
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2026-06-19

This document supersedes EN 50436-1:2014 and EN 50436-2:2014 and all of their amendments and corrigenda (if any).

EN 50436-1:2023 includes the following significant technical changes with respect to EN 50436-1:2014 and EN 50436-2:2014:

- EN 50436-2 was integrated into EN 50436-1 and all essential requirements incorporated into EN 50436-1;
- Clause 1, Scope, was updated to consider the requirements from Part 2;
- Clause 3, Terms and definitions, definitions were added for immobiliser, alcohol interlock, digital interface, low-power-consumption state and handset. Some existing definitions were updated;
- Clause 4, General requirements, was updated to reflect current communication requirements;
- Clause 6.6, Low-power-consumption state, the current in low-power-consumption state of the alcohol interlock was changed from 5 mA to 1 mA at 12 V and at 24 V;
- Clause 6.7, Electrical disturbances, was updated;
- Clause 6.7.2, Supply lines, test levels were adjusted;
- Clause 6.9, Electromagnetic compatibility, both notes were integrated into one note with reference to the EMC and RED Directives;
- Clause 7, Calibration curve, the tolerance was changed from $\pm 0,02$ mg/l or ± 15 % of the nominal value to $\pm 0,02$ mg/l or ± 10 % of the nominal value;
- Clause 8.4, Drop test, a description for the handset was added;
- Clause 9, Environmental test, the procedure for the test was revised and tolerances added where necessary;
- Clause 10, Breath sample, was revised to add tolerances to the test gas flow;
- Clause 11.1, Test gases, carbon dioxide was added;
- Clause 12.6, Filter, the complete clause was updated to distinguish between tube filter and disc filter;

- Clause 12.6.1, Tube Filter, the charcoal was specified to a mixture of pieces with diameters of 5 mm to 8 mm;
- Clause 12.7, Condensation, the clause was updated;
- Clause 12.8, Water, the clause was updated;
- Clause 12.10, Removal of handset, two additional tests were added;
- Clause 15.1, Instructions for installation, a note with the reference to EN 50436-7 was added;
- Clause 17, Labelling and marking, further requirements were added.

Introduction

The purpose of alcohol interlocks is to enhance traffic safety by preventing persons with alcohol concentrations exceeding a set limit value from driving a motor vehicle. The EN 50436 series specifies test methods and essential performance requirements for alcohol interlocks and gives guidance for decision makers, purchasers and users.

The content and requirements of this part of EN 50436 are based on the experience and necessities of using alcohol interlocks to prevent drink driving in several countries over several decades.

Therefore, alcohol interlocks to be used in all general preventive programmes and those for drink driving offenders and legally regulated programmes monitored or controlled in a comparable way should comply with this document.

Part 3 of this series of standards gives information on how to implement the usage of alcohol interlocks.

The purpose of the EN 50436 series is to specify essential performance requirements and to provide the respective test methods for available technologies. The technology of alcohol interlocks continues to evolve, and further innovations can be expected. These could be considered in new parts or revisions of this document.

1 Scope

This document specifies test methods and performance requirements for alcohol interlocks having a mouthpiece. It covers alcohol interlocks to be used in all general preventive programmes and those for drink driving offenders and legally regulated programmes monitored or controlled in a comparable way.

This document can also be used for alcohol interlocks intended for other applications.

This document is directed at test laboratories and manufacturers of alcohol interlocks. It defines requirements and test procedures for type testing.

Several parameters (such as alcohol concentration or breath volume) are specified in this document for the purpose of type testing according to this document only.

NOTE It can be necessary due to national regulations or depending on user requests to set the values of the prescribed parameters differently when the alcohol interlocks are in use.

This document also applies to alcohol interlocks integrated into control systems of the vehicle as well as to accessory devices connected to the alcohol interlock.

This document does not apply to

- instruments measuring the alcohol concentration in the ambient air in the vehicle,
- alcohol interlocks not having a mouthpiece,
- methods of installation and connections to the vehicle.

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 50436-4, *Alcohol interlocks — Test methods and performance requirements — Part 4: Connection and digital interface between the alcohol interlock and the vehicle*

EN 60068-2-78, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state* (IEC 60068-2-78)

EN 60529, *Degrees of protection provided by enclosures (IP Code)* (IEC 60529)

ISO 7637-2, *Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only*

ISO 7637-3, *Road vehicles — Electrical disturbances from conduction and coupling — Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines*

ISO 10605, *Road vehicles — Test methods for electrical disturbances from electrostatic discharge*

ISO 16750-1, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 1: General*

ISO 16750-2:2012, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 2: Electrical loads*

ISO 16750-3:2012, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 3: Mechanical loads*

ISO 16750-4:2010, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 4: Climatic loads*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50436-4 and the following apply.

3.1

immobiliser

device which is intended to prevent the vehicle being driven powered by its own motor

Note 1 to entry: In this document the expression motor includes combustion engine, electric motor or hybrid power unit.

3.2

alcohol interlock

device that acts as a vehicle immobiliser which, when installed, can be brought into the not blocking state only after the presentation and analysis of an accepted breath sample with an alcohol concentration below a limit value

3.3

breath sample

breath sample taken under forced expiration

3.4

accepted breath sample

breath sample fulfilling set requirements for volume, flow, exhalation time and other human breath sample characteristics

Note 1 to entry: The acceptance of a breath sample is independent from the breath test alcohol concentration result.

3.5

not accepted breath sample

breath sample that does not fulfil the set requirements or is otherwise aborted by the device

3.6

breath alcohol concentration

mass concentration of ethanol, expressed in mg/l (milligram ethanol per litre breath), in a breath sample delivered into an alcohol interlock

3.7

breath alcohol concentration limit

set value of breath alcohol concentration at or above which the alcohol interlock records a fail test result

3.8

breath test

providing a breath sample to an alcohol interlock

3.9

pass test

breath test provided with a measured breath alcohol concentration below the breath alcohol concentration limit

3.10

fail test

breath test provided with a measured breath alcohol concentration at or above the breath alcohol concentration limit