# SLOVENSKI STANDARD
# oSIST prEN 1846-2:2022

**01-junij-2022**

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**Gasilska in reševalna vozila - 2. del: Splošne zahteve - Varnost in obnašanje pri uporabi**

Firefighting and rescue service vehicles - Part 2: Common requirements - Safety and performance

Feuerwehrfahrzeuge - Teil 2: Allgemeine Anforderungen - Sicherheit und Leistung

Véhicules des services de secours et de lutte contre l'incendie - Partie 2 : Prescriptions communes - Sécurité et performance



**Ta slovenski standard je istoveten z:** **prEN 1846-2**



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**ICS:**

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| 13.220.10 | Gašenje požara | Fire-fighting |
| 43.160 | Vozila za posebne namene | Special purpose vehicles |

**oSIST prEN 1846-2:2022** **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# DRAFT
# prEN 1846-2

April 2022

ICS 13.220.10

Will supersede EN 1846-2:2009+A1:2013

English Version

# Firefighting and rescue service vehicles - Part 2: Common requirements - Safety and performance

Véhicules des services de secours et de lutte contre l'incendie - Partie 2 : Prescriptions communes - Sécurité et performance

Feuerwehrfahrzeuge - Teil 2: Allgemeine Anforderungen - Sicherheit und Leistung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 192.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.



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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 1846-2:2022) has been prepared by Technical Committee CEN/TC 192 “Fire and rescue service equipment”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1846-2:2009+A1:2013.

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

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

EN 1846 consists of the following parts, under the general title *Firefighting and rescue service vehicles*:

— *Part 1: Nomenclature and designation;*

— *Part 2: Common requirements — Safety and performance;*

— *Part 3: Permanently installed equipment — Safety and performance.*



A list of all parts in a series can be found on the CEN website.

In comparison with the previous edition, the following technical modifications have been made:

— the normative references and Directives have been updated;



— the definitions 3.2 (gross laden mass), 3.13 (cabin) and 3.15 (working platform) have been updated;

— the definitions 3.17 (performance level), 3.18 (power take-off), 3.19 (design check), 3.20 (calculation), 3.21 (visual verification), 3.22 (measurement), 3.23 (functional test) and 3.24 (special verification) have been added;

— the list of significant hazards has been moved to the new Annex K;

— 4.1.1.2 (Energy sources) and 4.1.1.3 (Hot/cold part) have been added;

— 4.1.1.6 (Engine) has been renamed “Main power supply” and updated;

— 4.1.1.10 (Reversing of vehicle) has been updated;

— 4.1.2.2.1 (Construction) has been completed with requirements for ROPS;

— 4.1.2.2.2 (crew protection) has been updated;

— 4.1.2.2.3 (Cabins designed to take respiratory protective device) has been renamed “Cabins designed to take self-contained breathing apparatus (SCBA)” and updated;

— 4.1.2.2.7 (Accommodation) has been updated;

— 4.1.2.2.7, Figure 9 (Minimum dimensions of crew compartment(s)) has been amended and a new Figure 10 “Examples with tunnel” has been added;

— in 4.1.2.3.2 (Access to crew compartments), addition of requirements in case of access with more than two steps;

— 4.1.2.3.3 (Access to equipment other than roof mounted) has been updated;

— 4.1.2.3.5 (Design of the roof and working platforms for access purposes if applicable) has been updated;

— 4.1.2.4.1 (Equipment lockers – General) has been amended;

— 4.1.2.4.2 (Drawers and stowage trays or other stowage devices in lockers) has been updated;

— 4.1.3.2 (Batteries) has been updated;

— 4.1.3.3 (Lighting) has been updated;

— 4.2.1.2, Table 6 (Geometric dimensions) has been updated;

— 4.2.1.3, Table 7 (Dynamic performances) has been amended;

— 4.2.1.4.2 (Driving of special equipment by the engine) “engine” has been replaced with “power source”;

— 4.2.1.5 (Driven components), the verification has been amended;

— 4.2.1.8 (Tyres and wheels) has been renamed “Traction” and updated;

— 4.2.1.9 (Fuel tank and range) has been renamed “Energy storage and range” and updated;

— 4.2.2.2.1 (Cabin – General) has been amended;

— 4.2.2.3.2 (Equipment storage) has been completed with addition of recommendations and visual verification;

— 4.2.3.2 (Electrical power supply) has been updated;

— 5.4.2 (Other markings) has been completed regarding electrical fuses;

— addition of 4.2.6 (Heat resistance of vulnerable organs) and its corresponding verification;

— Annex C (Different methods of determining levels of slip-resistance) has been updated;

— Annex I (Tests for ROPS of the cabin) and Annex J (Example of a ROPS design) have been added;

— Annex ZA (Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC aimed to be covered) has been updated;

— editorial changes have been introduced.

# Introduction

This document is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in the case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.



The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

# 1 Scope

**1.1** This document specifies the common requirements for safety and the (minimum) common performance requirements of firefighting and rescue service vehicles as designated in EN 1846-1.

NOTE 1 Categories and mass classes of these vehicles are given in EN 1846-1.

When drafting this document, it has been assumed that the finished standard automotive chassis (or the chassis designed in accordance with the same principles) that is the basis for the firefighting or rescue vehicle offers an acceptable safety level for its basic transport functions within the limits specified by the manufacturer. Therefore, this document does not formulate requirements for this chassis.

This document deals with all significant hazards, hazardous situations and events relevant to firefighting and rescue service vehicles, when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer.

Complementary specific requirements for aerial appliances are the subject of the following European Standards:

— EN 1777: Hydraulic platforms (HPs) for firefighting and rescue services,

— EN 14043: Turntable ladders with combined movements,

— EN 14044: Turntable ladders with sequential movements.



These specific requirements can supplement or modify the requirements of this document and they take precedence over the corresponding requirements of this document.

NOTE 2 Additional regulations, not dealt with in this document, can apply in relation with the use of the vehicles on public roads.

This document deals with firefighting and rescue vehicles intended for use in a temperature range from –15 °C to +40 °C.



NOTE 3 In the case of utilization outside this temperature range, additional measures might be necessary as agreed between the manufacturer and the user. Such requirements are outside the scope of this document.

**1.2** This document does not deal with the following types of firefighting or rescue vehicles or equipment:

— vehicles designed exclusively for carrying personnel;

— vehicles with a gross laden mass not exceeding 3 t;

— boats;

— aircraft;

— railway vehicles;

— ambulances (see EN 1789);

— provisions for non-firefighting removable equipment driven by PTO;

— airport vehicles in the scope of the recommendations of the International Civil Aviation Organization (ICAO).

**1.3** This document deals with the technical requirements to minimize the hazards listed in Annex K which can arise during operational use, routine checking and maintenance of firefighting and rescue service vehicles when carried out in accordance with the specifications given by the manufacturer or his authorized representative.

It does not cover the hazards generated by:

— non-permanently installed equipment i.e. portable equipment carried on the vehicle;

— use in potentially explosive atmospheres;

— commissioning and decommissioning;

— electromagnetic compatibility.

Additional measures not dealt with in this document might be necessary for specific use (e.g. fire in natural environment, flooding, etc.).

**1.4** This document is not applicable to machines that are manufactured before its date of publication as a European Standard.

## 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 659, *Protective gloves for firefighters*

EN 981:1996+A1:2008, *Safety of machinery - System of auditory and visual danger and information signals*



EN 1846-1:2011, *Firefighting and rescue service vehicles - Part 1: Nomenclature and designation*



EN 60204-1:2018, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016)*

CEN/TS 15989, *Firefighting and rescue service vehicles and equipment - Graphical symbols for control elements and displays and for markings*

EN ISO 3744:2010, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4871, *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871)*

EN ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry - Seat index point (ISO 5353)*

EN ISO 11201, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13857:2019, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*

EN ISO 14120:2015, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

IEC 60364-7-717, *Low-voltage electrical installations — Part 7-717: Requirements for special installations or locations — Mobile or transportable units*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and EN 1846-1:2011 and the following apply.

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

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp



**3.1**
**unladen mass**
mass of the vehicle, including the driver (75 kg) and all items needed to operate the vehicle including a full capacity of cooling water, fuel and oil and all permanently installed equipment, but excluding the spare wheel and extinguishing agents



**3.2**
**gross laden mass**
**GLM**
unladen vehicle mass as defined in 3.1, plus the mass of the remainder of the crew, calculated as 90 kg for each crew member and his personal protective equipment, and additional 15 kg for the driver's personal protective equipment for which the vehicle is designed and the mass of the extinguishing agents and other equipment to be carried

**3.3**
**permissible total laden mass**
**PTLM**
maximum permitted gross laden mass as declared by the chassis manufacturer

Note 1 to entry: See European Directive 2007/46/EC.

**3.4**
**approach angle**
$\alpha$
angle between the horizontal ground contact plane and the plane tangent to the tyres of the front wheels, such that no rigid part ahead of the first axle of the vehicle is located between these planes, measured when the vehicle is at its gross laden mass

Note 1 to entry: See Figure 1.

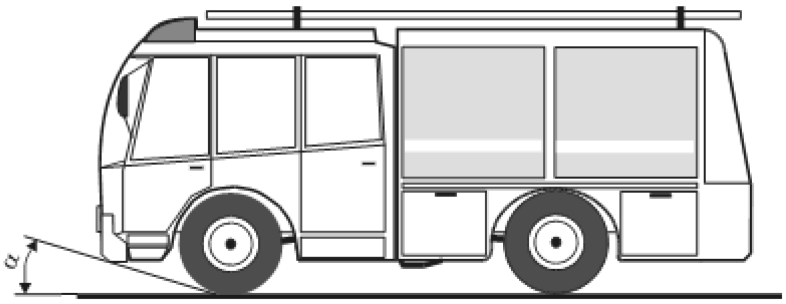



**Figure 1**

**3.5**
**departure angle**
*ß*
angle between the horizontal ground contact plane and the plane tangent to the tyres of the rearmost wheels such that no rigid part of the vehicle behind the last axle is between these planes, measured when the vehicle is at its gross laden mass

Note 1 to entry: See Figure 2.

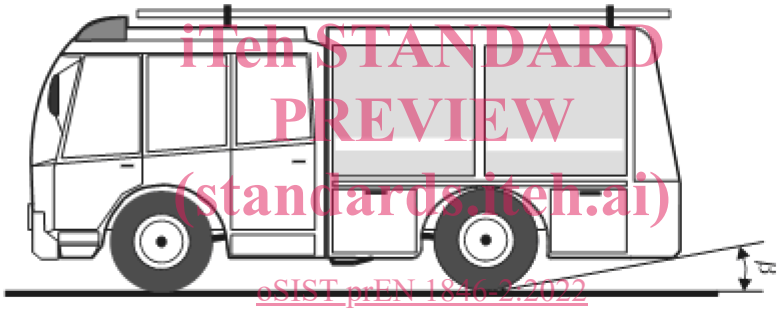





**Figure 2**

**3.6**
**angle of slope**
*γ*
smallest angle measured, when the vehicle is at its gross laden mass, between two planes tangential to the innermost front and rear tyres which intersect at the lowest rigid point or surface of the underside of the vehicle between these tyres

Note 1 to entry: See Figure 3.

Note 2 to entry: This angle defines the largest ramp over which the vehicle can pass.

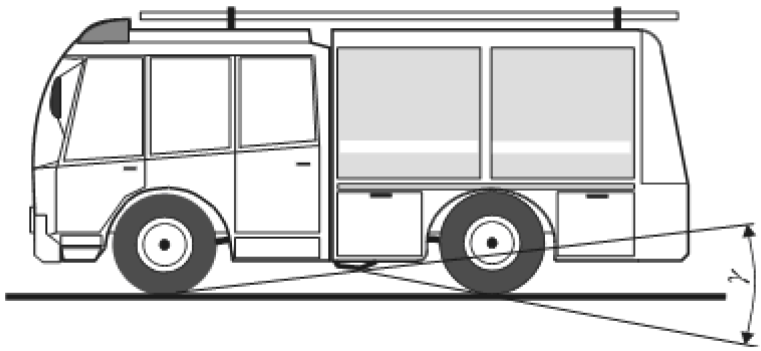



**Figure 3**

**3.7**
**ground clearance**
*d*
distance between the horizontal ground contact plane and the lowest fixed point on the vehicle, other than the axles, measured when the vehicle is at its gross laden mass

Note 1 to entry: See Figure 4.

Note 2 to entry: Multiple axle sets are considered as a single axle.



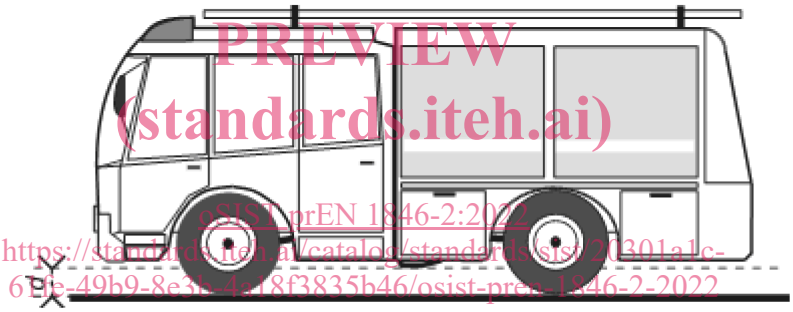


**Figure 4**

**3.8**
**ground clearance under axle**
*h*
distance determined by the highest part of a quadrilateral having its base as the ground contact plane between the innermost wheels on an axle and its upper plane as the lowest rigid part of the vehicle falling between the wheels and within 0,3 m of both sides of the vehicle centre line, measured when the vehicle is at its gross laden mass

Note 1 to entry: See Figure 5.

Note 2 to entry: Equipment like stabilization, suspension system and snow chain system belongs to the axle.

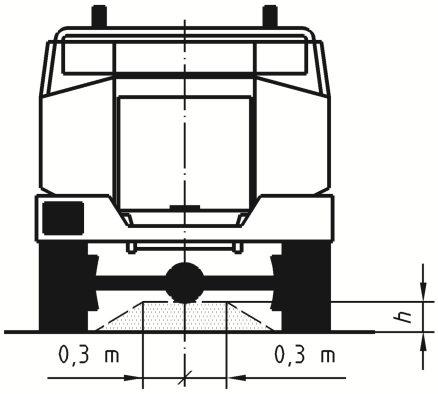



**Figure 5**

**3.9**
**cross-axle capability**
*c*
ability of the vehicle to remain functional and with no unintended interference between the various components of the vehicle including cabin and bodywork, when driven onto two blocks of specified height *c* simultaneously disposed diagonally on a horizontal plane, measured when the vehicle is at its gross laden mass



**3.10**
**turning circle between walls**
*D*
diameter of the smallest imaginary cylinder within which the vehicle can turn at maximum steering lock



Note 1 to entry: See Figure 6.

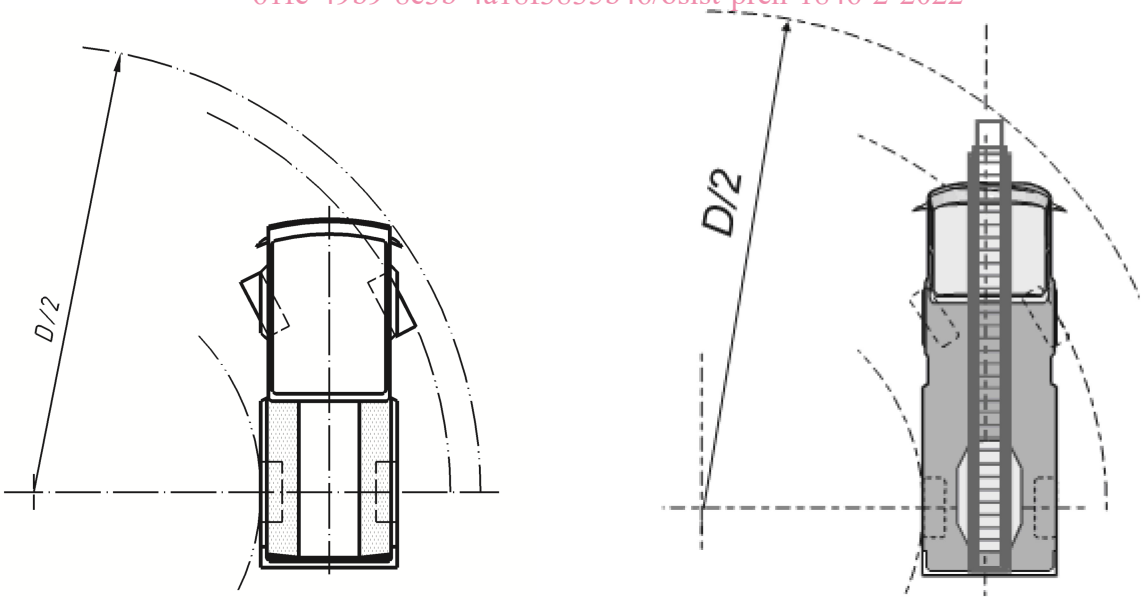
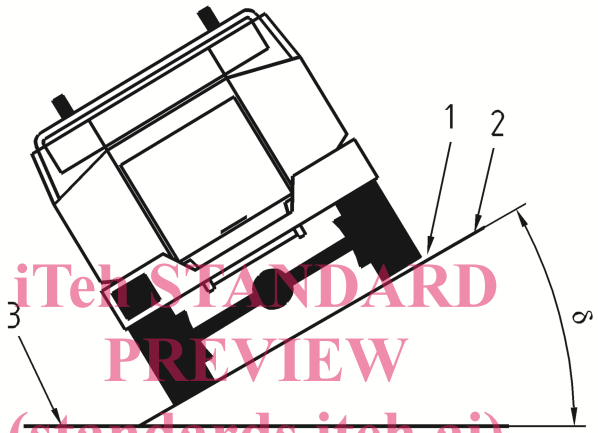



**Figure 6**

**3.11**
**static tilt angle**
$\delta$
angle between the horizontal and ground contact planes at which the vehicle when tilted along its longitudinal axis undergoes loss of stability

**3.12**
**loss of stability**
point at which the final upslope wheel loses contact with the ground contact plane, at the gross laden mass of the vehicle

Note 1 to entry: See Figure 7.






**Key**

1 loss of contact
2 ground contact plane
3 horizontal plane



**Figure 7**

**3.13**
**cabin**
driver's cab with or without crew compartment

Note 1 to entry: See Figure 8.