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Passive safety of support structures for road equipment – Requirements and test methods; English version EN 12767:2019, English translation of DIN EN 12767:2019-10

Passive Sicherheit von Tragkonstruktionen für die Straßenausstattung – Anforderungen und Prüfverfahren; Englische Fassung EN 12767:2019, Englische Übersetzung von DIN EN 12767:2019-10

Sécurité passive des structures supports d'équipements de la route – Prescriptions et méthodes d'essai; Version anglaise EN 12767:2019, Traduction anglaise de DIN EN 12767:2019-10

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In case of doubt, the German-language original shall be considered authoritative.



A comma is used as the decimal marker.

National foreword

This document (EN 12767:2019) has been prepared by Technical Committee CEN/TC 226 "Road equipment" (Secretariat: AFNOR, France).

The responsible German body involved in its preparation was *DIN-Normenausschuss Bauwesen* (DIN Standards Committee Building and Civil Engineering), Working Committee NA 005-10-21 AA "Road restraint systems (national mirror committee for CEN/TC 226/WG 1 and WG 10), Joint committee with FGSV".

This document includes National footnotes to subclauses M.2.3.1 and M.4.3.7 in Annex M.

Amendments

This standard differs from DIN EN 12767:2008-01 as follows:

- a) Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC has been taken into account;
- b) a push-pull test has been introduced to enable a comparison to be made between the backfills used in the test and those on-site;
- c) the boundary values for occupant safety (ASI and THIV) independent of the energy absorption class have been harmonized;
- d) the occupant safety class has been replaced by an alphanumeric character instead of a number to make a clear distinction from the old approach (EN 12767:2007). Now, NE-C, LE-C and HE-C have the same occupant safety. The best occupant safety is achieved for A;
- e) collapse modes to classify if test items become detached or do not become detached have been introduced;
- f) direction classes to take into account any sensitiveness to impact angle have been introduced;
- g) the test description, including installation manual and translation of roof deformation into a measurable value, to reduce the influence of the vehicle structure on the test results has been improved;
- h) an additional test at 50 km/h in cases where the test item is not activated at low speed has been introduced. An explanation of the definition of "activated" is also given;
- i) the rules for the determination of families (product families) based on the tested limit(s) have been improved;
- j) a risk assessment approach, in line with EN 1317-1:2010, for assessing changes of a version and for the use of (for example) the virtual test has been introduced;
- k) the possibility to declare, under certain conditions, intermediate speed classes has been added.

Previous editions

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EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

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English Version

Passive safety of support structures for road equipment -Requirements and test methods

Sécurité passive des structures supports d'équipements de la route - Prescriptions et méthodes d'essai Passive Sicherheit von Tragkonstruktionen für die Straßenausstattung - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 24 June 2019.

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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 (EN 12767:2019) has been prepared by Technical Committee CEN/TC 226 "Road Equipment", the secretariat of which is held by AFNOR.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12767:2007.

The significant technical changes incorporated in this revision are:

- incorporation of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC terminology;
- introduction of a push-pull test to enable a comparison to be made between the backfills used in the test and those on-site;
- harmonization of the boundary values for occupant safety (ASI and THIV) independent of the energy absorption class;
- replacement of the occupant safety class by an alphanumeric character instead of a number to make a clear distinction with the old (EN 12767:2007) approach. Now, NE-C, LE-C and HE-C have the same occupant safety. The best occupant safety is achieved for A;
- introduction of collapse modes to classify if test items become detached or do not become detached;
- introduction of direction classes to take into account any sensitiveness to impact angle;
- improved test description, include installation manual and translation of roof deformation into a measurable value, to reduce the influence of the vehicle structure on the test results;
- introduction of an extra test at 50 km/h for cases where the test-item is not activated at low speed.
 An explanation of the definition of "activated" is also given;
- better rules for the determination of families (product families) based on the tested limit(s);
- introduction of a risk assessment approach, in line with the EN 1317-1:2010, for assessing changes of a version, and the use of (for example) virtual testing in this;
- possibility to declare, under certain conditions, intermediate speed classes.

Most of the comments collected from all CEN members to the previous version of this norm are implemented or solved. The definition and use of newer technologies has to be developed before introduction into the standard.

Some added changes mentioned above are expressed in a new performance classification for the product. This results in a longer description of the overall passive safety performance, but at the end, it gives a clearer indication of product performance. For example, an old performance classification like "100, HE,

3" could be translated to "100-HE-C-S-SE-MD-1". In this example, the last 4 sub-indications stands for backfill type (S), collapse mode (SE), direction class (MD) and risk of roof indentation.

Translation of older tests to this new standard is possible when sufficient information is available in the reports, photographs and videos of the tests.

The previous version of EN 12767 included test acceptance criteria – this is now, for convenience, repeated in Annex A.

When this standard is used as a supporting standard for a product standard under CPR (e.g. sign supports) relevant clauses of Annexes A, G and H are supposed to be copied inside the product standard, and the product standard refers to the rest of this standard.

When this standard is used for testing constructions with no product standard the specifying authority is supposed to refer to whole EN 12767, including Annexes A, G and H.

Annexes A, B, D, E, G, H, I, K, L, M of this document are normative, Annexes C, F, J are informative.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The severity of accidents for the occupant(s) of a vehicle is affected (in part) by the performance of the support structures for items of road equipment under impact. Based on safety considerations, support structures can be designed to behave in controlled ways to reduce the overall risk.

Passive safety is intended to reduce the severity of injury to vehicle occupants of a car in an impact with support structures of road equipment.

This document has been developed in order to provide:

- test methods for determining impact safety performance; and
- methods to handle the data resulting from the impact tests;
- technical background about passive safety that can be used in the product standard.

The test procedure includes guidelines:

- for test item selection, test parameters, detailed test methods with different test conditions, the data to record, and requirements for reporting;
- to assess the performance within families of product (called "product families") and for modified products (called "changed versions").

This document considers:

- two kinds of test inputs:
 - three speed classes (50, 70 and 100);
 - three Backfill types (standard aggregates (S), special (X) and Rigid (R)).
- five kinds of test outcomes:
 - three energy absorption classes: high energy absorbing (HE), low energy absorbing (LE) and non-energy absorbing (NE);
 - five occupant safety classes (from A to E);
 - two modes of collapse for support structures (Separation mode (SE) and No separation collapse mode (NS));
 - three direction classes (single-directional (SD), bi-directional (BD) and multi-directional (MD));
 - two classes of risk of roof indentation (0 or 1).

In order to help to evaluate the risk in case of a product modification, this document introduces Virtual Testing through the definition of procedures for verification, validation, and development of numerical models.

Based on the evaluation of the performance of each tested support structure, National and Local road authorities will be able to specify the performance class of an item of road equipment support structure in terms of the likely effect on the occupants of a vehicle in impact with the structure.