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

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Denna standard ersätter SS-EN 12767:2007, utgåva 2.

The European Standard EN 12767:2019 has the status of a Swedish Standard. This document contains the official version of EN 12767:2019.

This standard supersedes the SS-EN 12767:2007, edition 2.

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Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Vägutrustning, SIS/TK 248.

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EUROPEAN STANDARD

EN 12767

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2019

ICS 93.080.30

Supersedes EN 12767:2007

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.

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.

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

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SS-EN 12767:2019 (E)

Contents

European foreword.....	4
Introduction	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	7
4 Symbols and abbreviations	10
5 General test parameters.....	11
5.1 Test site.....	11
5.2 Backfill	11
5.3 Test vehicle.....	12
6 General test item parameters.....	13
6.1 General test item documentation.....	13
6.2 Test item selection.....	13
7 Test method	15
7.1 General.....	15
7.2 Impact angle.....	15
7.3 Impact point.....	15
7.4 Impact speed.....	21
7.5 Simplified test method for non-harmful support structures	21
8 Impact data measurement.....	22
8.1 General.....	22
8.2 Impact data to be recorded.....	22
8.3 Test item behaviour	23
8.4 Vehicle behaviour	24
8.5 Impact severity indexes.....	24
8.6 Photographic coverage	24
9 Test report.....	25
9.1 General.....	25
9.2 Test data decimal rounding.....	25
Annex A (normative) Data evaluation	27
Annex B (normative) Backfill requirements	32
Annex C (informative) Push / pull test	35
Annex D (normative) Vehicle data	36
Annex E (normative) Vehicle calibration	38
Annex F (informative) Bogie vehicle	40
Annex G (normative) Product families.....	41
Annex H (normative) Changed versions	44
Annex I (normative) Determining the speed and mass of the falling support.....	45

Annex J (informative) Test report	46
Annex K (normative) Deemed to comply	52
Annex L (normative) Use of test results performed in accordance with previous versions of EN 12767	53
Annex M (normative) Virtual testing.....	55
Bibliography	69

SS-EN 12767:2019 (E)

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.

SS-EN 12767:2019 (E)

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.

1 Scope

This document specifies performance test procedures to determine the passive safety properties of support structures such as lighting columns, sign posts, signal supports, structural elements, foundations, detachable products and any other components used to support a particular item of equipment on the roadside.

This document provides a common basis for the vehicle impact testing of items of road equipment support structures.

This document does not apply to road restraint systems.

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 1317-1:2010, *Road restraint systems — Part 1: Terminology and general criteria for test methods*

EN 13285, *Unbound mixtures — Specifications*

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

ISO 10392, *Road vehicles — Determination of centre of gravity*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1

impact test

test in which a test vehicle impacts a test item of road equipment support structure

3.2

impact angle

angle between the intended direction of traffic and the approach path of the test vehicle into the test item

3.3

vehicle impact point

initial point of impact on the test vehicle

3.4

test item impact point

initial point of impact on the test item