



SLOVENSKI STANDARD
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Oprema cest - 5. del: Zahteve za proizvode in ugotavljanje skladnosti za sisteme za zadrževanje vozil

Road restraint systems - Part 5: Product requirements and evaluation of conformity for vehicle restraint systems

Rückhaltesysteme an Straßen - Teil 5: Anforderungen an die Produkte, Konformitätsverfahren und -bescheinigung für Fahrzeugrückhaltesysteme

Dispositifs de retenue routiers - Partie 5: Exigences relatives aux produits et évaluation de la conformité pour les dispositifs de retenue pour véhicules

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EUROPEAN STANDARD

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Road restraint systems - Part 5: Product requirements and evaluation of conformity for vehicle restraint systems

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Rückhaltesysteme an Straßen - Teil 5: Anforderungen an die Produkte, Konformitätsverfahren und -bewertung für Fahrzeugrückhaltesysteme

This European Standard was approved by CEN on 28 September 2006 and includes Amendment 1 approved by CEN on 30 May 2008 and Amendment 2 approved by CEN on 23 January 2012.

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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Contents

	Page
Foreword.....	3
Introduction.....	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Requirements	6
4.1 Performance under impact	6
4.2 Height of combined vehicle/ pedestrian parapets.....	7
4.3 Durability	7
5 Technical description of the vehicle restraint system (VRS).....	8
5.1 General.....	8
5.2 Product description.....	8
5.3 Details of system modifications.....	8
5.4 Installation requirements.....	8
6 Evaluation of conformity.....	9
6.1 General.....	9
6.2 Type testing.....	9
6.3 Factory Production Control (FPC).....	11
6.4 Prototype products.....	13
7 Cases of technical specification non-compliance	13
8 Installation of road restraint systems.....	13
Annex A (normative) Modification of VRS tested in accordance with EN 1317-1, A_2 EN 1317-2 A_2 , EN 1317-3 or ENV 1317-4	14
Annex B (informative) Example list of cases of possible modifications to the requirements of Clauses 4, 5 and 6.....	17
Annex C (normative) A_2 Resistance to snow removal A_2	19
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.....	22
Bibliography	41

Foreword

This document (EN 1317-5:2007+A2:2012) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2012 and conflicting national standards shall be withdrawn at the latest by September 2012.

This document includes Amendment 1, approved by CEN on 2008-05-30 and Amendment 2, approved by CEN on 2012-01-23.

This document supersedes $\boxed{A_2}$ EN 1317-5:2007+A1:2008 $\boxed{A_2}$.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$ and $\boxed{A_2}$ $\boxed{A_2}$.

This document has been prepared under a mandate 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.

This European Standard consists of this document and the following parts under the general title: *Road restraint systems*.


- *Part 1: Terminology and general criteria for test methods*
- *Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers*
- *Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions*
- *Part 4: Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers*
- *Part 6: Pedestrian restraint system*

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EN 1317-5:2007+A2:2012 (E)**Introduction**

 This document is a product standard for vehicle restraint systems placed on the market.

This document is designed for use in conjunction with Parts 1, 2, 3, ENV 1317 part 4 (to be replaced with prEN 1317 part 4 and 7).

To ensure the full performance of road restraint systems in use, their production and installation is intended to be controlled in accordance with this document. 

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1 Scope

This European Standard specifies requirements for evaluation of conformity of the following vehicle restraint systems:

- a) safety barriers;
- b) crash cushions;
- c) terminals (will be effective when ENV 1317-4 becomes an EN);
- d) transitions (will be effective when ENV 1317-4 becomes an EN);
- e) vehicle / pedestrian parapets (only for the vehicle restraint function).

Pedestrian parapet requirements are not covered in this document.

Requirements for the evaluation of durability with respect to weathering are included in this document.

Requirements for other forms of durability (e.g. marine environment, sand abrasion) are not included.

Temporary barriers are not within the scope of this document.

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2 Normative references

The following referenced documents are indispensable for the application 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 206-1, *Concrete – Part 1: Specification, performance, production and conformity*

EN 335-1, *Durability of wood and wood-based products – Definition of use classes – Part 1: General*

EN 335-2, *Durability of wood and wood-based products – Definition of use classes – Part 2: Application to solid wood*

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

EN 1317-2:2010, *Road restraint systems – Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers including vehicle parapets*

EN 1317-3:2010, *Road restraint systems – Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions*

ENV 1317-4:2001, *Road restraint systems – Part 4: Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers*

prEN 1317-6, *Road restraint systems – Pedestrian restraint systems, pedestrian parapet*

EN 10346, *Continuously hot-dip coated steel flat products – Technical delivery conditions*

EN 13369, *Common rules for precast concrete products*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods (ISO 1461:1999)*

EN ISO 9001:2008, *Quality management systems – Requirements (ISO 9001:2008)*

EN 1317-5:2007+A2:2012 (E)

3 Terms and definitions

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

3.1

testing laboratory

competent laboratory, which measures, examines, tests, calibrates or otherwise determines the characteristics or performance of materials or products within the scope of this document. A laboratory accredited by a signatory of EA (European co-operation for accreditation) or the appropriate statutory instrument, within the scope of this document, in the territory where the test was executed may be presumed to be competent

3.2

working life

period of time during which the performance of a product will be maintained at a level that enables the product to fulfil the requirements of this document (i.e. the essential characteristics of a product to meet or exceed minimum acceptable values, without incurring major costs for repair or replacement). The working life of a product depends upon its inherent durability and normal maintenance

NOTE A clear distinction should be made between the assumed economically reasonable working life for a product, which underlies the assessment of durability in technical specifications, and the actual working life of a product in a works. The latter depends on many factors beyond the control of the producer, such as design, location of use (exposure), installation, use and maintenance. **The assumed working life can thus not be interpreted as being a guarantee given by the producer.**

3.3

durability

ability of a product to maintain its required performance over time, under the influence of foreseeable actions. Subject to normal maintenance, a product should enable properly designed and executed works to fulfil specified requirements for an economically reasonable working life of the product

3.4

manufacturer (synonymous with "producer")

organization with legal responsibility for placing a CE-Mark on a product (see Annex ZA)

4 Requirements

4.1 Performance under impact

4.1.1 Safety barriers

Safety barriers shall be tested to and shall conform to the requirements of EN 1317-1 and A_2 EN 1317-2 A_2 .

4.1.2 Vehicle parapets

Vehicle parapets shall be tested to and shall conform to the requirements of EN 1317-1 and A_2 EN 1317-2 A_2 .

4.1.3 Crash cushions

Crash cushions shall be tested to and shall conform to the requirements of EN 1317-1 and EN 1317-3.

4.1.4 Terminals

Terminals shall be tested to and shall conform to the requirements of EN 1317-1 and ENV 1317-4 (will be effective when ENV 1317-4 becomes an EN).

4.1.5 Transitions

Transitions shall be tested to and shall conform to the requirements of EN 1317-1 and ENV 1317-4 (will be effective when ENV 1317-4 becomes an EN).

4.1.6 Combined vehicle / pedestrian parapets

Vehicle / pedestrian parapets shall be tested to and shall conform to the requirements of EN 1317-1 and ^{A2}EN 1317-2 ^{A2} and prEN 1317-6 (will be effective when prEN 1317-6 becomes an EN).

4.1.7 Threshold levels

Vehicle restraint systems shall conform to the minimum threshold levels defined in Table 1.

Table 1 – Minimum threshold levels for vehicle restraint systems

Safety barriers	EN 1317-2 (in accordance with Table 2)	N1
Crash cushions	EN 1317-3 (in accordance with Table 3)	Class 50
Terminals	ENV 1317-4 (in accordance with Table 1)	P1
Transitions	ENV 1317-4 (in accordance with 4.2)	N1
Combined vehicle/parapets	EN 1317-2 (in accordance with Table 2) and prEN 1317-6	N1

SIST EN 1317-5:2007+A2:2012

4.2 Height of combined vehicle / pedestrian parapets

The height of combined vehicle / pedestrian parapets shall conform to prEN 1317-6 (will be effective when prEN 1317-6 becomes an EN).

4.3 Durability

All vehicle restraint systems shall be durable for an economically reasonable working life, for which a reviewable experience-based description and / or related measurements of durability shall be adequate.

Road restraint systems can have foundation systems, the economically reasonable working life of which relates to the supporting structure, and this needs to be reported separately to that of the road restraint system if supplied by the VRS manufacturer.

- a) Manufacturer shall declare the materials and protective coatings used on the road restraint system;
- b) manufacturer shall declare an assessment of durability including the identification of technical characteristics of materials affecting durability, and the methods of evaluation (e.g. coating mass determination, adhesion testing).

Issues affecting durability may include the following examples:

- c) specification of protective coating in accordance with EN ISO 1461 and EN 10326 and/or level of treatment of materials;
- d) composition and thickness of material in accordance with EN 206-1 for concrete and EN 13369 for precast concrete;

EN 1317-5:2007+A2:2012 (E)

- e) **A1** specification of wood treatment and or/natural durability of wood to be used in use classes specified in EN 335-1 and EN 335-2; **A1**
- f) recommendations on installation conditions in the works in the case of onerous site conditions;
- g) specified maintenance requirements (important in harsh environments).

NOTE The working life of a road restraint system depends upon its inherent durability and the prevailing environmental conditions. A clear distinction should be made between the (declared) working life for a product, based on the assessment of durability in technical specifications, and the actual working life of a product. The latter depends on many factors beyond the control of the manufacturer, such as installation design, environmental location, handling, use, and maintenance.

5 Technical description of the vehicle restraint system (VRS)**5.1 General**

The manufacturer shall provide the following information.

5.2 Product description

- a) general system arrangement drawings with installation layout assembly descriptions and tolerances;
- b) drawings of all component geometries with dimensions, tolerances, and all material specifications;
- c) specifications for all materials and all finishes (including protective treatment system);
- d) assessment of durability of the product;
- e) drawings of all components sub-assembled in the factory;
- f) complete parts list, including weights;
- g) details of pre-stressing (if relevant);
- h) any other relevant information (e.g. recycling information, environment, security);
- i) information on regulated substances.

5.3 Details of system modifications

Details of system modifications approved since the ITT (Initial Type Testing).

5.4 Installation requirements

- a) assembly drawings, of the product tested, including tolerances;
- b) description of the installation works, including equipment;
- c) procedures for installation (erection, assembly, foundations, etc.) as set out in the installation manual;
- d) ambient temperature at time of installation (if relevant);
- e) details of tensioning (if relevant);
- f) description of the soil conditions and/or foundations suitable for the system;
- g) provisions for repair, inspection and maintenance;

- h) any other relevant recycling information, details of toxic or dangerous materials present in the works.

NOTE Road restraint systems installed on bridges should be classified in accordance with EN 1991-2 regarding their impact loads.

6 Evaluation of conformity

6.1 General

The conformity of the road restraint system to the requirements of this document and with the stated values (including classes) shall be demonstrated by:

- Initial Type Testing (ITT);
- Factory Production Control (FPC) by the manufacturer, including product assessment.

For the purposes of testing, road restraint systems may be grouped into families as defined in A_2 EN 1317-2 A_2 and EN 1317-3 or ENV 1317-4, where it is considered that the selected property/properties is/are common to all road restraint systems within that family (for example, crash cushions conforming to this document).

6.2 Type testing

6.2.1 Initial Type Testing (ITT)

6.2.1.1 General

An initial type test is the complete set of tests conforming to EN 1317-1 and A_2 EN 1317-2 A_2 , EN 1317-3 or ENV 1317-4. To demonstrate conformity with this document an ITT shall be performed on each VRS. Modified products shall be evaluated in accordance with 6.2.1.5.

6.2.1.2 Information required in the ITT

As a minimum, the manufacturer shall provide the information for assessment in accordance with 5.2 and 5.3, the full-scale vehicle impact test report and the evaluation report of the tested item.

6.2.1.3 Evaluation report of test item

The evaluation report shall comprise the following information:

- a) verification that materials are as specified by the manufacturer in accordance with 5.2;
- b) verification that geometries and dimensions are as specified by the manufacturer in accordance with 5.2;
- c) verification of protective treatments, if any;
- d) soils and foundations report relating to the ITT;
- e) verification that the product is installed in accordance with the specified layout in accordance with 5.4.

6.2.1.4 Initial Type Test report

The ITT report shall include the following information as a minimum:

- a) impact test report to EN 1317-1, A_2 EN 1317-2 A_2 , EN 1317-3 or ENV 1317-4;

EN 1317-5:2007+A2:2012 (E)

- b) technical description of the road restraint system as in 5.2;
- c) evaluation report as in 6.2.1.3.

6.2.1.5 Modified products

Implications of any modifications to an ITT tested system shall be evaluated and declared in respect of the effect on the performance of the road restraint system:

- a) manufacturer shall describe the modifications brought to the drawings and specifications of the VRS, which had been subjected to the Initial Type Testing for the evaluation of the performance of the initial product;
- b) modified product will be tested and assessed in accordance with Annex A.

6.2.1.6 Characteristics

All characteristics in 4.1 shall be subject to initial type testing. Release of dangerous substances may be assessed indirectly by controlling the content of the substance concerned.

6.2.1.7 Use of existing impact test reports (historical data)

In order to facilitate the use of existing road restraint systems which have been tested in accordance with EN 1317 before the availability of harmonized European Standards and to avoid unnecessary duplication of cost and possible delays, which could result in lower safety for users, existing systems may be accepted as meeting regulatory requirements without new impact tests by the use of historic data under the following conditions:

- a) road restraint system shall have been assessed by a testing laboratory in accordance with existing or a former version of EN 1317-1, ^{A2} EN 1317-2 ^{A2}, EN 1317-3 or ENV 1317-4 or a prEN 1317 standard, and the test results and possible additional information show that the road restraint system conforms to the requirements of this document;
- b) provisions of this clause shall be invoked within 3 years after the end of the co existence period.

6.2.1.8 Shared ITT results

An individual manufacturer may use the ITT results obtained by another party, for example carried out by industry or a designer, on a product that he considers to be the same, provided that the following conditions are fulfilled:

- a) manufacturer is able to demonstrate that the product is identical (e.g. has the same dimensions, the same raw materials and the same components) with the one that has been subjected to ITT;
- b) party who has performed the test has agreed to give the results and has provided the report of the test to the manufacturer who will use the test result for his own ITT.
- c) manufacturer, who uses the ITT results obtained by someone else to demonstrate his own declaration of conformity, remains responsible for the product being in compliance with all the requirements of this document, including both the design¹ and the manufacture of the product.

NOTE This does not mean a "shared ITT". An ITT concerns the evaluation of a specific product made by a given manufacturer. In the declaration of conformity established by the manufacturer, which is a document with legal status, the product is identified and the name of the manufacturer is given. Therefore, ITT cannot be shared, only results of testing.

¹ For specific products (e.g. for design using Eurocodes) special provisions may apply.

6.2.2 Sampling

Initial Type Testing shall be performed on samples representative of the road restraint system to be placed on the market.

6.3 Factory Production Control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform to the declared performance characteristics. The FPC system shall consist of written procedures (works' manual), regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product. Records shall remain legible, readily identifiable and retrievable.

^{A2} NOTE Manufacturers having an FPC system, which complies with EN ISO 9000 series and which addresses the requirements of this European Standard are recognized as satisfying the FPC requirements of the Council Directive 89/106/EEC. ^{A2}

The results of inspections, tests or assessments requiring action shall be recorded, as shall any action taken. The action to be taken when control values or criteria are not met shall be recorded and retained for the period specified in the manufacturer's FPC procedures.

The manufacturer may delegate to a management representative the responsibility and authority for:

- a) effective identification of non-conformities, and implementation of their rectification;
- b) revision of the Factory Production Control system to correct identified causes of non-conformity, when necessary;
- c) effective implementation of a traceability method as defined in this document.

6.3.2 Factory Production Control (FPC) requirements

The Initial inspection is for the purpose of determining whether the resources, in terms of staff and equipment together with procedures for process control to the proposed Factory Production Control plan, are in place to assure conformity of the product with the technical specifications.

The manufacturer shall establish procedures to ensure that the production tolerances allow for the road restraint systems' performances to conform to the declared values, derived from initial type testing. The minimum frequency for component testing and evaluation as part of FPC is once a year.

The manufacturer shall record the results. These records shall at least include the following information:

- a) identification of the road restraint systems tested;
- b) date of sampling and testing;
- c) test methods performed;
- d) test results.