



## Road restraint systems

### Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers including vehicle parapets

Rückhaltesysteme an Straßen — Teil 2: Leistungsklassen, Abnahmekriterien für Anprallprüfungen und Prüfverfahren für Schutzeinrichtungen und Fahrzeugbrüstungen

Dispositifs de retenue routiers — Partie 2: Classes de performance, critères d'acceptation des essais de choc et méthodes d'essai pour les barrières de sécurité incluant les barrières de bord d'ouvrage d'art

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Road equipment

## **National Foreword**

Due to some misprints in the German version a new edition has been published. To ensure that the English and German version of ÖNORM EN 1317-2 have the same date of issue, the English version of ÖNORM EN 1317-2 will be withdrawn and published again without any modifications and corrections.

For the application of the series EN 1317 ÖNORM V 1317 has been drafted by Committee 211.

The present ÖNORM EN 1317(all parts) and ÖNORM V 1317 shall be applied jointly.

English Version

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

Dispositifs de retenue routiers - Partie 2: Classes de  
performance, critères d'acceptation des essais de choc et  
méthodes d'essai pour les barrières de sécurité incluant les  
barrières de bord d'ouvrage d'art

Rückhaltesysteme an Straßen - Teil 2: Leistungsklassen,  
Abnahmekriterien für Anprallprüfungen und Prüfverfahren  
für Schutzeinrichtungen und Fahrzeugbrüstungen

This European Standard was approved by CEN on 29 April 2010.

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 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 Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This document (EN 1317-2:2010) 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 January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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

This document supersedes EN 1317-2:1998 + EN 1317-2/A1:2006.

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).

EN 1317 consists of the following parts:

- EN 1317-1, *Road restraint systems — Part 1: Terminology and general criteria for test methods*;
- EN 1317-2, *Road restraint systems — Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers including vehicle parapets*;
- EN 1317-3, *Road restraint systems — Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions*;
- ENV 1317-4, *Road restraint systems — Part 4: Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers*;
- prEN 1317-4, *Road restraint systems — Part 4: Performance classes, impact test acceptance criteria and test methods for transitions of safety barriers* (under preparation: this document will supersede ENV 1317-4:2001 for the clauses concerning transitions);
- EN 1317-5, *Road restraint systems — Part 5: Product requirements and evaluation of conformity for vehicle restraint systems*;
- prEN 1317-6, *Road restraint systems — Pedestrian restraint systems — Part 6: Pedestrian Parapet* (under preparation);
- prEN 1317-7, *Road restraint systems — Part 7: Performance classes, impact test acceptance criteria and test methods for terminals of safety barriers* (under preparation: this document will supersede ENV 1317-4:2001 for the clauses concerning terminals);
- prEN 1317-8, *Road restraint systems — Part 8: Motorcycle road restraint systems which reduce the impact severity of motorcyclist collisions with safety barriers* (under preparation).

Annex A is normative and Annex B is informative.

The significant technical changes incorporated in this revision are:

### 3.2 Containment levels

In Table 2 the new containment classes L1, L2, L3, L4a and L4b have been added, requiring the same tests of the corresponding H classes plus the test TB 32.

### 3.3 Impact severity

The requirement for the index PHD (Post impact Head Deceleration) has been cancelled. Only ASI and THIV are required.

### 3.5 Deformation of the restraint system

New requirement on the accuracy of measurement of Dynamic Deflection and Working Width:

*The accuracy required for the measurement of the dynamic deflection and for the working width shall be 10 % but not less than 0,1 m.*

New definition of vehicle intrusion (VI).

New definitions of Normalised Dynamic Deflection  $D_N$ , Normalised Working Width  $W_N$  and Normalised Vehicle Intrusion  $VI_N$ .

Table 4 – Levels of working width based on the normalised values

Table 5 – Levels of normalised vehicle intrusion (new item)

## 4 Impact test acceptance criteria

Table 6 – Safety barrier test parameters includes containment levels L

### 4.2 Safety barrier including parapet behaviour

The first two sentences of the paragraph in the 1998 text:

*The safety barrier shall contain and redirect the vehicle without complete breakage of the principal longitudinal elements of the system.*

*No major part of the safety barrier shall become totally detached or present an undue hazard to other traffic, pedestrians or personnel in a work zone.*

are replaced by:

*The safety barrier including parapet shall contain the vehicle without complete breakage of any of the principal longitudinal elements of the system.*

*All totally detached parts of the safety barrier with a mass greater than 2,0 kg shall be identified, located and recorded in the test report with their size.*

### 4.3 Test vehicle behaviour

The first two sentences of the paragraph in the 1998 text:

*The centre of gravity of the vehicle shall not cross the centreline of the deformed system.*

*The vehicle shall remain upright during and after impact, although moderate rolling, pitching and yawing are acceptable.*

are replaced by:

*During and after the impact, no more than one of the wheels of the vehicle shall completely pass over or under the safety barrier.*

*The vehicle shall not roll over (including rollover of the vehicle onto its side) during or after impact.*

*For tests with HGVs and buses, not more than 5 % of the mass of the ballast shall become detached or be spilt during the test up to the time when the wheel tracks of the vehicle leaves the exit box.*

#### **4.4 Severity Index**

The requirement for the index PHD (Post impact Head Deceleration) has been cancelled. Only ASI and THIV are required.

#### **4.7 Tests for system type tested safety barriers (Families of barriers)**

New specifications for families of barriers.

### **5 Test methods**

The specifications of 5.1 "Test Site" and 5.2 "Test Vehicles" are moved to Part 1.

#### **5.3.2 Installation**

This subclause has been entirely revised with detailed requirements on the test length, end anchorages, pretensioned systems and infilling of vehicle pedestrian parapets.

#### **5.3.3 Position of the impact point**

New requirement:

*If the test house chooses an impact point other than that at a point about one third of the installation length, in order to ensure worst-case conditions, then this choice shall be justified in the test report.*

#### **5.5 Vehicle instrumentation**

The specifications of 5.5 are moved to Part 1.

#### **5.6 Photographic coverage**

New requirement:

*Normal speed cameras shall be operated at a minimum of 24 frames per second.*

### **Annex A – Detailed Test Report Template**

New normative item.

### **Annex B – Criteria for sufficient test length evaluation**

New informative item on a possible criterion to evaluate the adequacy of the length of the test installation.

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 and the United Kingdom.

## Introduction

This European Standard is a revision of EN 1317-2:1998. This standard includes improved impact test procedures and allows for the introduction of Families of Products and a report template.

In order to improve safety the design of roads may require the installation of safety barriers including vehicle parapets which are intended to contain errant vehicles safely for the benefit of the occupants and other road users on sections of road and at particular locations defined by the national or local authorities.

In this standard, several levels of performance are given for the three main criteria relating to the restraint of a road vehicle:

- The containment level;
- The impact severity levels;
- The deformation as expressed by the working width and vehicle intrusion (including normalised values).

The different performance levels of safety barriers including vehicle parapets will enable national and local authorities to specify the performance class of the system to be deployed.

The description of a safety barrier including vehicle parapet system conforming to this standard incorporates the relevant classes and performance levels of the product.

To ensure satisfactory product design it is highly recommended to consider the requirements of this standard and the references in Clause 2, together with the requirements of EN 1317-1. The evaluation of conformity and the durability should meet the requirements of EN 1317-5.



## 1 Scope

This European Standard specifies requirements on impact performance of safety barriers, including vehicle parapets, classes of containment, working width, vehicle intrusion and impact severity levels.

NOTE This European Standard should be read in conjunction with EN 1317-1. Both these standards support EN 1317-5.

The modifications included in standard are not a change of test criteria, in the sense of the EN 1317-5:2007+A1:2008, ZA.3.

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

prEN 1317-6, *Road restraint systems — Pedestrian restraint systems — Part 6: Pedestrian Parapet*

## 3 Performance classes

### 3.1 General

Safety barriers including vehicle parapets shall conform to the requirements of 3.2, 3.3 and 3.5 when tested in accordance with impact test criteria defined in Table 1.

Vehicle specifications and deviations shall conform to EN 1317-1.

**Table 1 — Vehicle impact test descriptions**

Test	Impact speed km/h	Impact angle °	Total mass kg	Type of vehicle
TB 11	100	20	900	Car
TB 21	80	8	1 300	Car
TB 22	80	15	1 300	Car
TB 31	80	20	1 500	Car
TB 32	110	20	1 500	Car
TB 41	70	8	10 000	Rigid HGV
TB 42	70	15	10 000	Rigid HGV
TB 51	70	20	13 000	Bus
TB 61	80	20	16 000	Rigid HGV
TB 71	65	20	30 000	Rigid HGV
TB 81	65	20	38 000	Articulated HGV

### 3.2 Containment levels

The containment levels of safety barriers including vehicle parapets shall conform to the requirements of Table 2 when tested in accordance with the vehicle impact test criteria defined in Table 1.