

Road restraint systems —

Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions

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British Standard

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National foreword

This British Standard is the official English language version of EN 1317-3:2000.

The UK participation in its preparation was entrusted by Technical Committee B/509, Road equipment, to Subcommittee B/509/1, Road restraint systems, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This part of BS EN 1317, together with parts 1 and 2 and the proposed parts 4 and 5, will collectively eventually supersede BS 6779 which will then be withdrawn. This is expected to take place by the end of 2000.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 19 and a back cover.

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Road restraint systems – Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions

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Rückhaltesysteme an Straßen – Teil 3: Leistungsklassen, Abnahmekriterien für Anprallprüfungen und Prüfverfahren für Anpralldämpfer

This European Standard was approved by CEN on 10 April 2000.

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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 Central Secretariat has the same status as the official versions.

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Foreword

This European Standard has been prepared by the 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 November 2000, and conflicting national standards shall be withdrawn at the latest by November 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard consists of the following parts under the general title, Road restraint systems:

- Part 1: Terminologie 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.

The following parts are not yet available but in course of preparation:

- Part 4: Impact tests acceptance criteria and test methods for terminals and transitions of safety barriers;
- Part 5: Durability and evaluation of conformity;
- Part 6: Pedestrian road restraint system, pedestrian parapet.

Introduction

Based on safety considerations, the design of roads may require the installation of crash cushions at certain locations. These are designed to reduce the severity of vehicle impact with a more resistive object.

One objective of this standard is to lead to the harmonization of current national standards and/or regulations for crash cushions and to categorize them into performance classes.

The standard specifies the levels of performance, required of crash cushions, for the restraint and/or redirection of impacting vehicles.

The impact severity of vehicles in collision with crash cushions is rated by the indices Theoretical Head Impact Velocity (THIV), Post-impact Head Deceleration (PHD) and Acceleration Severity Index (ASI) (see EN 1317-1).

The different performance levels will enable national and local authorities to specify the performance class of crash cushions. The type or class of road, its location, its geometrical layout, the existence of a vulnerable structure or potentially hazardous area adjacent to the road are factors to be taken into consideration.

Attention is drawn to the fact that the acceptance of a crash cushion will require the successful completion of a series of tests (see Table 1, 2, 3, etc.).

Additional sensitive areas, including transitions to an obstacle or a safety barrier, should be considered for tests.

To ensure proper use of this part of the standard, it is essential to consider all of the other parts of this standard, especially Part 5: Durability and attestation of conformity.

1 Scope

This European Standard specifies requirements for the performance of crash cushions from vehicle impacts. It specifies performance classes and acceptance criteria for impact tests.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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

ISO 6487 Road vehicles – Measurement techniques in impact tests – Instrumentation.

ISO 10392 Road vehicles with two axles – Determination of centre of gravity.

3 Abbreviations

ASI	Acceleration Severity Index
THIV	Theoretical Head Impact Velocity
PHD	Post-impact Head Deceleration

4 Definitions

For the purpose of this standard, the following definitions apply.

4.1 obstacle: the item being protected from vehicular impact by the presence of a crash cushion

4.2 front face of the obstacle: the surface closest to a plane drawn perpendicular to the centre line of the crash cushion

4.3 system type tested crash cushions: a system type tested crash cushion is a multiple performance product that can be assembled to form different models from the same set of components, to obtain different shapes and performances, with the same working mechanism for the system and its components

5 Performance classes

5.1 Acceptance criteria

The acceptance of a crash cushion shall be determined as a function of the following performance criteria:

- vehicle impact severity;
- vehicle trajectory;
- projection and distribution of test vehicle and crash cushion debris;
- containment level;
- crash cushion deflection.

NOTE See clause 6 for further details.

5.2 Velocity classes

Velocity classes shall be:

- 50 km/h;
- 80 km/h;
- 100 km/h;
- 110 km/h.