SLOVENSKI STANDARD
SIST EN 1317-5:2007+A1:2008/kFprA2:2011

01-november-2011

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 des véhicules

Ta slovenski standard je istoveten z: **EN 1317-5:2007+A1:2008/FprA2**

ICS:

13.200	Preprečevanje nesreč in katastrof	Accident and disaster control
93.080.30	Cestna oprema in pomožne naprave	Road equipment and installations

SIST EN 1317-5:2007+A1:2008/kFprA2:2011 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

FINAL DRAFT
EN 1317-5:2007+A1:2008

FprA2

September 2011

ICS 13.200; 93.080.30

English Version

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

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This draft amendment is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 226.

This draft amendment A2, if approved, will modify the European Standard EN 1317-5:2007+A1:2008. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Foreword

This document (EN 1317-5:2007+A1:2008/FprA2:2011) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This document is currently submitted to the UAP.

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.

1 Modification to the Introduction

Replace the existing introduction with the following:

“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.”

2 Modifications to Clause 2

Replace the reference:

“EN 10326, *Continuously hot-dip zinc coated strip and sheet of structural steels – Technical delivery conditions*”

with:

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

Replace

"EN ISO 9001:2000, *Quality managements systems – Requirements (ISO 9001:2000)*"

with

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

3 Modifications to 6.3

In 6.3.1, replace the second paragraph with the following:

"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."

Throughout sub-clause 6.3, replace "EN ISO 9001:2000" *with* "EN ISO 9001:2008".

4 Modification to A.5.2

Replace the existing text in footnote 2 with:

“Definition can be found in EN 1317-2:2010, 3.5.”.

5 Addition of a new Annex C

Add the following new Annex C:

"

Annex C
(normative)

Resistance to snow removal

C.1 General

Snow removal may damage a safety barrier which has not a sufficient resistance to snow removal.

C.2 Scope

This normative annex includes a classification of safety barriers for the resistance to snow removal. It includes the horizontal and vertical pressure of ploughed snow against the rail and minor impacts caused by the plough in the traffic face and upper edge of the rail. A simplified evaluation method is intended for normal steel beam barriers, rope fences and monolithic pre-cast or cast-in-place concrete barriers. A test is possible for other barrier types.

The specifying authority shall decide if classification is required.

This annex is not intended to be used with crash cushions, terminals and transitions.

C.3 Requirements

Metal beam safety barriers shall be classified into classes on the basis of Table C.1.

Table C.1 - Resistance to snow removal of metal beam safety barriers

Class of resistance to snow ploughing	Modified material thickness of a rail in steel [a]		Modified section modulus against horizontal loads [a]		Strength against vertical loads of the connection between a post and a rail
	Open profile (mm)	Tube (mm)	Rail (cm^3)	Post (cm^3)	
4	≧ 4	≧ 2,9	≧ 10	≧ 12	≥ Shear strength of M10 4,6 bolt
3	≧ 3	≧ 2,2	≧ 5	≧ 9	≥ Shear strength of M10 4,6 bolt
2	Rope fence				
1	Other				
[a] The modified material thickness and section modulus is defined in C.4.					

In class 3 and 4 the front edge of the rail shall protrude at least 40 mm in front of the post in order to protect posts. There shall be no bolts or roughness on the rail, which could prevent the snow plough from gliding along the barrier. The requirements for the modified section modulus in Table C.1 shall be reduced by 50 % for narrow rails (< 120 mm) which do not have contacts with snow plough.

Pre-cast or cast-in-place monolithic concrete barriers shall be declared to belong to class 4, when the strength class is C 25/30 or higher. Any unevenness in the traffic face shall not prevent the snow plough from gliding along the barrier.

In class 2 the longitudinal parts of the barrier shall be designed to remain undamaged in an impact by a snow plough, but post may be fully damaged.

C.4 Evaluation

C.4.1 Modified material thickness

The modified material thickness shall be calculated by using the following equation:

$$t_{mod} = t \times [f_{yd}/(235N/mm^2/1.1)]^{1/2} \quad (1)$$

where

t_{mod} is the modified material thickness of the rail;

t is the nominal steel thickness of the rail;

f_{yd} is the design yield strength of the rail material.

The nominal material thickness of the rail shall be observed from the drawings.

C.4.2 Modified section modulus

The modified section modulus of the post and rail against horizontal loads shall be calculated on the basis of the post and rail profile by using the following equations:

$$W_{mod,\ rail} = W_{rail} \times f_{yd}/(235N/mm^2/1.1) \quad (2)$$

$$W_{mod,\ post} = W_{post} \times f_{yd}/(235N/mm^2/1.1) \quad (3)$$

where

$W_{mod,\ rail}$ is the modified section modulus of the rail;

W_{rail} is the original (elastic) section modulus of the rail against horizontal loads;

$W_{mod,\ post}$ is the modified section modulus of the post;

W_{post} is the original (elastic) section modulus of the post against horizontal loads normal to the road.

The equation is applicable for metal, concrete, plastic and wood posts, too, when f_{yd} is replaced by a relevant parameter related to short duration loads in temperature of -5° which do not cause permanent deformation or cracks.

C.4.3 Strength against vertical loads

The evaluation of the connection between the post and rail shall be performed in the following way:

- in case of a simple shear connection with one bolt per connection the bolt dimension and strength class is simply compared with the bolt characteristics given in Table C.1;
- in other cases of connection a static calculation shall show in class 3 and 4 that the connection resists the same vertical point load (ULS) as one M 10 4.6 bolt in a simple shear connection.

C.4.4 Evaluation of gliding conditions

In classes 3 and 4 the evaluation of gliding conditions in any barrier type includes the following:

- identify the contact line in the traffic face of the barrier along which a plough with a vertical side edge glides;
- does the line protrude at least 40 mm in front of the posts;
- are there any bolts or roughness which may prevent the plough from gliding along that line, such as:
  - a cup head of a bolt shall not protrude more than 12 mm from the contact line;
  - a normal hexagonal head of a bolt shall not protrude more than 6 mm from the contact line;
  - a perpendicular step from the contact line shall not exceed 8 mm;
  - a tapered (45°) step from the contact line shall not exceed 25 mm.

C.5 Report

Observed material thickness, section modulus of the rail and post, including their modified values, and bolt characteristics and calculations and conclusions shall be reported. Calculations are not necessary if the results are self evident (e.g. M12 4.6. bolt compared with M10 4.6 bolt).

C.6 Innovative barrier types

Barrier types not mentioned above (concrete rail, wooden rail, plastic rail etc.) and innovative barrier types (rail thickness varies along the length, flexible self-restoring posts, etc.) shall be evaluated in a field exposure test where the barrier shall be compared along the same road section with reference barriers, preferable two other barrier types, which are already classified in accordance with Table C.1. In this road section the snow has to be removed beside the barrier in a way where a contact between the plough and the rail is common, and snow is removed at least 100 times before the evaluation. The damage in all the barriers shall be reported with photographs and damage descriptions.

As an alternative, controlled impacts by a snow plough may be used. In the test the barrier shall be compared with two other barrier types, which are already classified in accordance with Table C.1. The damage in all these barriers shall be reported with photographs and damage descriptions."

6 Modifications to Annex ZA

Replace Table ZA.1.b with the following:
"

Table ZA.1.b - Performance requirements for safety barriers

Product: Safety barrier **Intended use:** Vehicle Restraint System for circulations areas			
Essential characteristics	**Requirement clauses in this and other European Standard(s)**	**Levels and/or classes**	**Notes**
Performance under impact		None	
Containment level	EN 1317-2:2010, 3.2		a) Class N1 ... L4
Impact severity	EN 1317-2:2010, 3.3		b) Level A, B , C
Normalized working width	EN 1317-2:2010, 3.5		c) class
Normalized dynamic deflection	EN 1317-2:2010, 3.5		d) metres
Normalized vehicle intrusion	EN 1317-2:2010, 3.5		e) class
Durability	EN 1317-5:2007+A1:2008/FprA2: 2011, 4.3	None	-

Resistance to snow removal	EN 1317-5:2007+A1:2008/FprA2:2011, Annex C		Class 1 to 4
NOTE Normalized vehicle intrusion is applicable only to classes L and H.			

"

Add, after Table ZA.1.b, the following new paragraph:

"NOTE The requirement on the characteristic "Resistance to snow removal" is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option “No performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level."

Replace Table ZA.1.c with the following:

"

Product: Crash cushion **Intended use:** Vehicle Restraint System for circulations areas			
Essential characteristics	**Requirement clauses in this and other European Standard(s)**	**Levels and/or classes**	**Notes**
Performance under impact		None	
Performance level	EN 1317-3 :2010, 5.2		a) Level 50... 110
Impact severity	EN 1317-3 :2010, 5.3		b) Level A, B
Redirection zone	EN 1317-3 :2010, 6.3		c) class
Lateral displacement	EN 1317-3 :2010, 6.5		d) class
Durability	EN 1317-5:2007+A1:2008/FprA2:2011, 4.3	None	-

"