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English Version

**Road restraint systems - Guidelines for computational
mechanics of crash testing against vehicle restraint system -
Part 1: Common reference information and reporting**

Dispositifs de retenue routiers - Recommandations pour la
simulation numérique d'essai de choc sur des dispositifs
de retenue des véhicules - Partie 1: Information de
référence commune et documentation

Rückhaltesysteme an Straßen - Richtlinien für
Computersimulationen von Anprallprüfungen an Fahrzeug-
Rückhaltesysteme - Teil 1: Allgemeine Informationen und
Dokumentation

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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (CEN/TR 16303-1:2012) has been prepared by Technical Committee CEN/TC 226 "Road equipment", the secretariat of which is held by AFNOR.

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 consists of this document divided in five Parts under the general title: Guidelines for Computational Mechanics of Crash Testing against Vehicle Restraint System:

- *Part 1: Common reference information and reporting*
- *Part 2: Vehicle Modelling and Verification*
- *Part 3: Test Item Modelling and Verification*
- *Part 4: Validation Procedures*
- *Part 5: Analyst Qualification¹*

¹ In preparation

Introduction

In order to improve and maintain roads safety, the design of safer roads requires, on certain sections of road and at particular locations, the installation of road restraint systems. These road systems are designated to contain errant vehicles with a specified performance level and can provide guidance for pedestrians or other road users.

The EN 1317 standard identifies test methods and impact test acceptance criteria that need to be met to demonstrate compliance with the essential requirements for CE marking. In some cases, computational mechanics can be used in addition to physical crash testing in the CE marking process. That is why it becomes necessary to develop a methodology to verify and validate the result obtained with computational mechanics work and guarantee the reliability of the simulation itself.

Furthermore Computation mechanics can provide support in real life situations that are not described within EN 1317.

1 Scope

The focus of this Technical Report will be on establishing accuracy, credibility and confidence in the results of crash test simulations to roadside safety devices through the definition of procedures for verification and validation in roadside safety application. This part gives a general introduction and describes the organisation of this document.

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, *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*

EN 1317-5, *Road restraint systems — Part 5: Product requirements and evaluation of conformity for vehicle restraint systems*

prEN 1317-8, *Road restraint systems — Part 8: Motorcycle road restraint systems which reduce the impact severity of motorcyclist collisions with safety barriers*

CEN/TR 16303-2:2011, *Road restraint systems — Guidelines for Computational mechanics of crash testing against vehicle restraint system — Part 2: Vehicle Modelling and Verification*

CEN/TR 16303-3:2011, *Road restraint systems — Guidelines for computational mechanics of crash testing against vehicle restraint system — Part 3: Test Item Modelling and Verification*

CEN/TR 16303-4:2011, *Road restraint systems — Guidelines for computational mechanics of crash testing against vehicle restraint system — Part 4: Validation Procedures*

3 Abbreviations

ASI :	Acceleration severity index
CM/E:	Computational Mechanics Europe
COG:	Center of gravity
DD:	Maximum dynamic deflection of the VRS
FE:	Finite element
HGV	Heavy goods vehicles
MB:	Multi-body
PIRT:	Phenomena importance ranking table
THIV:	Theoretical head impact velocity