SLOVENSKI STANDARD
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Oprema cest - Splošne zahteve za usposobljenost laboratorijev, ki izvajajo virtualno testiranje za vrednotenje sistemov za zadrževanje vozil

Road restraint systems - General requirements for the competence of laboratories performing virtual testing for the evaluation of vehicle restraint systems

Rückhaltesysteme an Straßen - Allgemeine Anforderungen an die Kompetenz von Laboratorien, die virtuelle Prüfungen zur Bewertung von Fahrzeugrückhaltesystemen durchführen

Dispositifs de retenue routiers - Exigences générales pour les laboratoires effectuant des essais virtuels pour l'évaluation des dispositifs de retenue pour véhicules

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

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

This document is read in conjunction with:

— EN ISO/IEC 17025:2017

— EN 1317 (all parts)

— CEN/TS 1317-7:2023

— CEN/TS 1317-9:2023

— CEN/TR 1317-10:2023

— EN 16303:2020

— EN 12767:2019

— CEN/TR 16949:2016

— CEN/TS 17342:2019

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Introduction

The CE marking procedure for road restraint systems involves the classification of those systems by means of full-scale crash tests. Under certain conditions, defined in EN 1317-5:2007+A2:2012/AC:2012, it is allowed to certify modified products via computational simulations of the normally required full scale crash tests: virtual testing.

Virtual tests represent experimental tests which are carried on with numerical methods and calculators instead of laboratory instrumentation. In mechanics and structural analysis fields, these virtual tests are commonly carried on using finite element or multi-body codes developed for this purpose suited for detailed study of a wide range of physical phenomena.

The degree of complexity of the phenomenon to be analysed requires an extreme specialization of the calculation solver codes, which are generally developed to study a specific category of phenomena, and a very delicate activity in developing the models to be solved by these codes.

The use of virtual testing for road restraint systems certification is described in the EN 16303:2020. These tests are finite element or multi-body method computational simulations in which the crash test of the vehicle against the restraint system is reproduced in all its details.

The development of finite element or multi-body models for crash analyses requires a thorough knowledge of several disciplines ranging from continuum mechanics to the theory of finite element methods with a background of general knowledge of impact mechanics. Such deep knowledge is at the base of the skill required by operators in order to produce reliable analyses.

Virtual testing for design is usually supported by a physical test at the end of the design process while virtual testing for certification substitutes the physical test. It is therefore necessary to verify that the finite element or multi-body model is developed with the required skills, that the simulation is computed with adequate software and that the results are collected and processed in a suitable manner.

For this reason, two main requirements are pointed out: the model needs to be reliable for the purpose of certification by simulation and the operator needs to have all the required skills.

On the one hand the requirements on numerical models are well described within the EN 16303:2020, but on the other hand a lack of standards dealing with the requirements on the operator is pointed out.

The objective of this document is to provide guidelines for the qualification of laboratories performing virtual testing dealing with vehicle restraint systems. To avoid the misuse of this technique, the delivery of such document is considered as priority.

This document is going to represent a step-by-step procedure to assess the capability of the laboratories performing virtual testing dealing with vehicle restraint systems, to be used as reliable and safe part of the standardization process. Therefore, the objective of this document, used in conjunction with EN ISO/IEC 17025:2017, is to fill a gap in the standardization for the qualification of laboratories performing virtual testing dealing with vehicle restraint systems.

This document is used in conjunction with EN ISO/IEC 17025:2017 and is giving a guideline to identify requirements of EN ISO/IEC 17025:2017 that can be used for the accreditation to EN 16303:2020, requirements of EN ISO/IEC 17025:2017 that cannot be used for the accreditation to EN 16303:2020 and requirements of EN ISO/IEC 17025:2017 that can be used for the accreditation to EN 16303:2020 when modified according to this document.