SLOVENSKI STANDARD
SIST-TS CEN/TS 16786:2018

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Oprema cest - Blažilnik trka za tovorna vozila (TMA) - Razredi uporabnosti, merila za preskušanje ob naletu in preskus zmogljivosti

Road restraint systems - Truck Mounted Attenuators - Performance classes, impact test acceptance criteria and test performance

Rückhaltesysteme an Straßen - Transportfahrzeuggestützte mobile Anprallverzögerer (TMA) - Leistungsklassen, Abnahmekriterien für Anprallprüfungen und Prüfungsleistungen

Dispositifs de retenue routiers - Atténuateurs de choc montés sur camions - Classes de performance, critères d'acceptation des essais de choc et méthodes d'essai

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European foreword

This document (CEN/TS 16786:2018) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

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Introduction

Truck Mounted Attenuators (TMAs) are designed to protect occupants of impacting passenger motor vehicles from impacts with the rear of stationary or slow-moving mobile carriers used in work zones and during maintenance operations. During an impact with a TMA, the mobile carrier is accelerated forward as the impacting vehicle is decelerated. This can, in turn, pose a risk to road workers in front of the support vehicle.

This Technical Specification aims to conduct impact testing of whole TMA systems to establish the severity of an impact with the whole system, and to establish the trajectory of the impacting vehicle and mobile carrier following the impact.

1 Scope

This Technical Specification establishes test methods for whole Truck Mounted Attenuator systems (TMAs) under impact.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

EN 13036-4, *Road and airfield surface characteristics — Test methods — Part 4: Method for measurement of slip/skid resistance of a surface: The pendulum test*

ISO 8349, *Road vehicles — Measurement of road surface friction*

ISO 10392, *Road vehicles — Determination of centre of gravity*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
whole system
TMA, mobile carrier and any elements connecting the TMA and the mobile carrier

3.2
TMA
energy absorbing device fitted to a mobile carrier to reduce the severity of an impact with an impacting vehicle

3.3
mobile carrier
vehicle to which the TMA is attached

3.4
impacting vehicle
motor vehicle impacting the whole system during the type test

3.5
vehicle
any motor vehicle or its trailer as defined in 3.5.1 and 3.5.2

3.5.1
motor vehicle
any power-driven roadworthy vehicle which is moved by its own means, having four or more wheels

3.5.2
trailer
any non-self-propelled vehicle on wheels which is designed and constructed to be towed by a motor vehicle

3.6
testing laboratory
competent laboratory which measures, examines, tests, calibrates or otherwise determines the characteristics or performance of materials or products within the scope of this document

Note 1 to entry: A laboratory accredited by a signatory of the European co-operation for accreditation or the appropriate statutory instrument, within the scope of this document, in the territory where the test was executed may be presumed to be competent.

3.7
test site
location of the whole system prior to the test, and the approach, exit path and roll ahead distance for the impacting vehicle and mobile carrier

3.8
energy absorbing element
any part of the TMA or connection piece which is designed, or shown, to absorb energy during an impact by static and/or dynamic deformation and/or attenuation, as reported in at least one of the impact test reports

3.9
roll ahead
distance that the mobile carrier moves forward after impact by the impacting vehicle

3.10
test inertial mass
impacting vehicle and/or mobile carrier as delivered, including all fluids or fluid replacement if the actual vehicle fluids have been drained, plus ballast and recording and brake equipment, but excluding ATD

3.11
total mass
mass which includes all items in, on, or attached to, the impacting vehicle or whole system at the beginning of the test

3.12
automatic impact brake
system which automatically applies the air brakes on a mobile carrier

4 Abbreviations

For the purposes of this document, the following abbreviations apply.

AIB	Automatic Impact Brake
ASI	Acceleration Severity Index
ATD	Anthropomorphic Test Device
PTV	Pendulum Test Value
RFLAT	Roll Ahead Distance (on flat ground, as defined in EN 1317-1:2010, 5.1)
SRT	Skid- Resistance Tester
THIV	Theoretical Head Impact Velocity
TMA	Truck Mounted Attenuator

VCDI Vehicle Cockpit Deformation Index

5 Test parameters

5.1 Test site

The test site shall be as specified in EN 1317-1:2010, 5.1 and shall extend for a sufficient length forward of the mobile carrier to allow for the measurement of the roll ahead distance. The test site shall also be sufficiently wide to assess the redirection trajectory of the impacting vehicle.

Asphaltic or concrete surfaces shall be used. Actions shall be taken to minimize dust generation.

A friction test shall be performed in the impact area in accordance with ISO 8349 in dry conditions to estimate the friction coefficient. The friction of the surface of the test site (asphalt or concrete) shall be measured with the Portable Skid- Resistance Tester (SRT) according to EN 13036-4. Friction value and class shall be included in the test report. Also alternative friction testers in line with the statement in EN 1436:2007+A1:2008, 4.5, can be used. EN 13036-4 calls the measuring device a Pendulum Tester and uses it to determine the Pendulum Test Value (PTV) which gives an indication about the skid/slip resistance of a surface. All details shall be included in the test report.

Conditions such as a polished surface or a bleeding asphalt surface that could lower available tyre-pavement friction shall not be used. Gravel or any other particulate shall not be added to the test area to alter the tyre-pavement friction.

5.2 Test vehicles

5.2.1 Impacting vehicles

The 900 kg impacting vehicle shall meet the requirements of EN 1317-1:2010, 5.2 and EN 1317-1:2010, Table 1.

The 2 000 kg impacting vehicle shall meet the requirements of EN 1317-1:2010, 5.2 and the vehicle specifications under test conditions shall be as specified in Table 1.