



BSI Standards Publication

Railway applications — Vehicle end design for trams and light rail vehicles with respect to pedestrian safety

National foreword

This Published Document is the UK implementation of CEN/TR 17420:2020.

The UK participation in its preparation was entrusted to Technical Committee RAE/3/-/11, Railway Applications - Structural requirements and Welding.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 580 89048 2

ICS 45.060.10; 45.140

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 January 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL REPORT

CEN/TR 17420

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

January 2020

ICS 45.060.10; 45.140

English Version

Railway applications - Vehicle end design for trams and light rail vehicles with respect to pedestrian safety

Applications ferroviaires - Conception de l'extrémité des véhicules pour tramways et véhicule ferroviaire léger en ce qui concerne la sécurité des piétons

Bahnanwendungen - Fahrzeugkopfgestaltung von Straßenbahnen und Light rail Fahrzeugen im Hinblick auf den Passantenschutz

This Technical Report was approved by CEN on 23 September 2019. It has been drawn up by the Technical Committee CEN/TC 256.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	3
1 Scope	3
2 Normative references	4
3 Terms and definitions	5
4 Symbols and abbreviations	7
5 Front end design of tram vehicles and light rail vehicles.....	7
6 Reference collision scenario type A.....	8
7 Reference collision scenario type B.....	18
Annex A (informative) PACM test protocol report.....	24
Bibliography.....	30

European foreword

This document (CEN/TR 17420:2020) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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.

1 Scope

This technical report is applicable to tram vehicles according to EN 17343¹. Tram-Train vehicles, on track machines, infrastructure inspection vehicles and road-rail machines according to EN 17343¹ and demountable machines/machinery are not in the scope of this technical report.

This technical report describes passive safety measures to reduce the consequences of collisions with pedestrians. These measures provide the last means of protection when all other possibilities of preventing an accident have failed, i.e.:

- design recommendations for the vehicle front to minimize the impact effect on a pedestrian when hit,
- design recommendations for the vehicle front end for side (lateral) deflections in order to minimize the risk of being drawn under the vehicle on flat ground (embedded track),
- design recommendations for the vehicle body underframe to not aggravate injuries to a pedestrian/body lying on the ground,
- recommendations to prevent the pedestrian from being over-run by the leading wheels of the vehicle.

The following measures to actively improve safety are not in the scope of this technical report:

- colour of front;
- additional position lights;
- additional cameras;
- driver assistance systems;
- additional acoustic warning devices, etc.;
- view of the driver / mirrors;
- consequences for pedestrian injuries due to secondary impact with infrastructure (side posts, concrete ground, poles, trees, etc.).

The recommendations of this technical report only apply to new vehicles.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 15663:2017+A1:2018, *Railway applications – Vehicle reference masses*

¹ Under preparation. Stage at the time of publication: prEN 17343.