Railway applications — Aerodynamics

Part 6: Requirements and test procedures for cross wind assessment
National foreword

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Requirements and test procedures for cross wind assessment

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Contents

European foreword ................................................................................................................................................. 6
Introduction .................................................................................................................................................................. 7
1 Scope................................................................................................................................................................... 8
2 Normative references............................................................................................................................................... 8
3 Terms and definitions ........................................................................................................................................... 8
4 Symbols and abbreviations .................................................................................................................................. 9
5 Methods and requirements to assess cross wind stability of vehicles .............................................................. 22
  5.1 General.......................................................................................................................................................... 22
  5.2 Applicability of cross wind methodologies for rolling stock assessment purposes ................................... 23
  5.3 Determination of aerodynamic coefficients ............................................................................................ 25
    5.3.1 General................................................................................................................................................ 25
    5.3.2 Predictive formula .............................................................................................................................. 25
    5.3.3 Simulations by Computational Fluid Dynamics (CFD) ...................................................................... 26
  5.4 Reduced-scale wind tunnel measurements ................................................................................................ 29
  5.5 Determination of wheel unloading due to cross winds ............................................................................. 34
    5.4.1 General................................................................................................................................................ 34
    5.4.2 Simple method ................................................................................................................................... 34
    5.4.3 Advanced quasi-static method .......................................................................................................... 37
    5.4.4 Time-dependent MBS method using a Chinese hat wind scenario .................................................. 40
  5.6 Presentation form of characteristic wind curves (CWCs) ......................................................................... 47
    5.5.1 General................................................................................................................................................ 47
    5.5.2 CWC presentation form for passenger vehicles and locomotives ................................................... 48
    5.5.3 CWC presentation form for freight wagons ..................................................................................... 49
  5.6 Requirements .............................................................................................................................................. 50
  5.6.1 Requirements for passenger vehicles and locomotives running at 250 km/h ≤ v_{\text{max}} ≤ 360 km/h ....... 50
  5.6.2 Requirements for passenger vehicles and locomotives running 140 km/h < v_{\text{max}} < 250 km/h ............. 53
  5.6.3 Requirements for freight wagons .......................................................................................................... 53
6 Method to acquire the needed railway line data ............................................................................................... 54
  6.1 General........................................................................................................................................................ 54
  6.2 Presentation form of railway line data ........................................................................................................ 54
    6.2.1 General................................................................................................................................................ 54
    6.2.2 Plan profile ......................................................................................................................................... 54
    6.2.3 Vertical profile ................................................................................................................................... 55
    6.2.4 Track design speed ............................................................................................................................. 56
    6.2.5 Walls .................................................................................................................................................. 57
    6.2.6 Meteorological input data for line description .................................................................................. 57
    6.2.7 Integrated line database .................................................................................................................... 58
    6.2.8 Required minimum resolution/accuracy .......................................................................................... 60
7 Methods to assess the wind exposure of a railway line .................................................................................. 60
Guidance for the analysis and assessment of the cross wind risk .......................................................... 61

8.1 General .................................................................................................................................................. 61
8.2 Infrastructure with train speeds at or above 250 km/h ................................................................. 61
8.3 Infrastructure with train speeds below 250 km/h ............................................................................. 61

9 Required documentation ......................................................................................................................... 62

9.1 General ................................................................................................................................................ 62
9.2 Assessment of cross wind stability of passenger vehicles and locomotives ................................. 62
9.3 Assessment of cross wind stability of freight vehicles ...................................................................... 62
9.4 Acquisition of railway line data ......................................................................................................... 62

Annex A (informative) Application of methods to assess cross wind stability of vehicles within Europe .......................... 63

Annex B (informative) Blockage correction ............................................................................................. 67

B.1 Dynamic pressure method .................................................................................................................. 67
B.2 German method ................................................................................................................................... 67
B.3 UK method ........................................................................................................................................... 67
B.4 Slotted walls .......................................................................................................................................... 68

Annex C (normative) Wind tunnel benchmark test data for standard ground configuration ............... 69

C.1 General ................................................................................................................................................ 69
C.2 ICE 3 leading vehicle wind tunnel model ......................................................................................... 69
C.3 TGV Duplex power car wind tunnel model ...................................................................................... 70
C.4 ETR 500 power car wind tunnel model ............................................................................................ 71

Annex D (informative) Other ground configurations for wind tunnel testing ....................................... 73

D.1 Flat ground with gap (TSI HS RST) ................................................................................................. 73
D.2 Double track ballast and rails (TSI HS RST) .................................................................................. 73
D.3 Standard embankment of 6 m height (TSI HS RST) ....................................................................... 73
D.4 Flat ground without gap (Finnish method) ....................................................................................... 75
D.5 Double track ballast and rails (UK method) .................................................................................... 75

Annex E (informative) Wind tunnel benchmark test data for other ground configurations ................. 77

E.1 General ................................................................................................................................................ 77
E.2 ICE 3 leading vehicle wind tunnel model ......................................................................................... 77
E.3 TGV Duplex power car wind tunnel model ..................................................................................... 77
E.4 ETR 500 power car wind tunnel model ............................................................................................ 81

Annex F (informative) Embankment overspeed effect ........................................................................... 90

Annex G (informative) Atmospheric boundary layer wind tunnel testing ............................................. 91

G.1 General ................................................................................................................................................. 91
G.2 Benchmark tests ................................................................................................................................. 91
G.3 Wind simulation ................................................................................................................................. 92
G.3.1 Boundary layer profiles ................................................................................................................ 92
G.3.2 Turbulence intensities .................................................................................................................... 92
G.3.3 Turbulence integral length scale ................................................................. 93
G.4 Model scale and blockage requirements ................................................................. 93
G.5 Modelling accuracy ............................................................................................ 93
G.6 Instrumentation requirements ............................................................................. 93
G.6.1 General ............................................................................................................. 93
G.6.2 Speed measurement ........................................................................................ 93
G.6.3 Force and moment balance ............................................................................. 94
G.7 Data acquisition requirements ............................................................................ 94
G.7.1 General ............................................................................................................. 94
G.7.2 Time scale, sampling frequency and acquisition duration ................................. 94
G.7.3 Measurement of temperature and atmospheric pressure ................................ 95
G.8 Calculation of mean values ............................................................................... 95
G.9 Calculation of peak values ................................................................................ 95
G.10 Calculation of air density .................................................................................. 96
G.11 Calculation of the uncorrected rolling moment coefficient ................................. 96
G.12 Determination of the lee rail roll moment coefficient ......................................... 97
G.13 Data interpolation ............................................................................................. 97
Annex H (informative) Five mass model ................................................................. 98
H.1 General ............................................................................................................. 98
H.2 Derivation of formulae ....................................................................................... 100
H.3 Example calculations ....................................................................................... 104
H.3.1 General ........................................................................................................ 104
H.3.2 Example vehicle 1 ........................................................................................ 105
H.3.3 Example vehicle 2 ........................................................................................ 105
Annex I (normative) Mathematical model for the Chinese hat ................................. 113
I.1 Mathematical model for Chinese hat ................................................................. 113
I.2 Example calculation for Chinese hat ................................................................. 116
Annex J (informative) Stochastic wind model ........................................................ 122
J.1 General ............................................................................................................. 122
J.2 Assumptions ..................................................................................................... 122
J.3 Application range ............................................................................................. 122
J.4 General Approach ............................................................................................ 122
J.4.1 General ........................................................................................................ 122
J.4.2 First step: wind tunnel tests (aerodynamic properties determination) ............... 123
J.4.3 Second step: calculation of turbulent wind speed ............................................ 123
J.4.4 Third step: evaluation of aerodynamic forces ................................................. 127
J.4.5 Fourth step: simulation of vehicle dynamics ................................................................................... 128
J.4.6 Fifth step: evaluation of characteristic wind speed ............................................................................ 128

Annex K (informative) Stability of passenger vehicles and locomotives against overturning according to national guidelines .......................................................................................................... 130

K.1 General ................................................................................................................................................ 130
K.2 According to DB Guideline 80704 (Germany) .................................................................................... 130
K.3 According to Railway Group Standard GM/RT 2141 (Great Britain) ................................................. 132

Annex L (informative) Information on methods to assess the wind exposure of a railway line ................................................................. 133

L.1 General ................................................................................................................................................ 133
L.2 Wind map approaches .......................................................................................................................... 133
L.3 Transfer approaches ............................................................................................................................. 134

Annex M (informative) Extended CWCs .................................................................................................. 136

Bibliography .............................................................................................................................................. 139
European foreword

This document (EN 14067-6:2018+A1:2022) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

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 includes Amendment 1 approved by CEN on 6 June 2022.

This document supersedes EN 14067-6:2018.

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This European Standard is part of the series "Railway applications — Aerodynamics" which consists of the following parts:

— Part 1: Symbols and units;
— Part 3: Aerodynamics in tunnels;
— Part 4: Requirements and test procedures for aerodynamics on open track;
— Part 5: Requirements and test procedures for aerodynamics in tunnels;
— Part 6: Requirements and test procedures for cross wind assessment.

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Introduction

Trains running on open track are exposed to cross winds. The cross wind safety of railway operations depends on vehicle and infrastructure characteristics and operational conditions. Important parameters are:

— aerodynamic characteristics of the vehicle;

— vehicle dynamics (e.g. mass, suspension, bump stops);

— track gauge;

— line characteristics (radius and cant of the track, height of embankments and bridges, walls near the track);

— wind exposure of the line;

— operating speed, mode of operation (non-tilting, tilting, running direction).
1 Scope

This document gives guidelines for the cross wind assessment of railways.

This document is applicable to all passenger vehicles, locomotives and power cars (with a maximum train speed above 140 km/h up to 360 km/h) and freight wagons (with a maximum train speed above 80 km/h up to 160 km/h) and track gauges from 1 435 mm to 1 668 mm inclusive. For passenger vehicles, locomotives and power cars with a maximum train speed between 250 km/h and 360 km/h, a requirement to demonstrate the cross wind stability is imposed. This document is not applicable to light rail and urban rail 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 14067-4, Railway applications – Aerodynamics – Part 4: Requirements and test procedures for aerodynamics on open track

EN 14363, Railway applications - Testing and Simulation for the acceptance of running characteristics of railway vehicles - Running Behaviour and stationary tests

EN 15663, Railway applications - Vehicle reference masses

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 bias
systematic error affecting an estimate

Note 1 to entry: In this document, it is expressed as the ratio of a coefficient obtained during benchmark wind tunnel tests to the equivalent coefficient obtained during new wind tunnel tests.

3.2 coordinate system
system denoting the axis for forces, moments, dimensions and wind speeds as defined in Figure 1

Note 1 to entry: The coordinate system is shown in Figure 1.