

# DIN EN 14067-4:2025-07 (E)

## Railway applications - Aerodynamics - Part 4: Requirements and assessment procedures for aerodynamics on open track (includes Amendment A1:2025)

---

<b>Contents</b>		<b>Page</b>
European foreword .....		4
Introduction .....		5
1	Scope .....	6
2	Normative references .....	6
3	Terms and definitions .....	6
4	Symbols .....	7
5	Requirements on locomotives and passenger rolling stock .....	14
5.1	Limitation of pressure variations beside the track .....	14
5.1.1	General .....	14
5.1.2	Requirements .....	14
5.1.3	Full conformity assessment .....	15
5.1.4	Simplified conformity assessment .....	15
5.2	Limitation of slipstream effects beside the track .....	17
5.2.1	General .....	17
5.2.2	Requirements .....	17
5.2.3	Full conformity assessment .....	19
5.2.4	Simplified conformity assessment .....	20
5.3	Aerodynamic loads in the track bed .....	22
5.4	Aerodynamically induced ballast projection .....	22
5.5	Running resistance .....	22
6	Requirements on infrastructure .....	23
6.1	Train-induced pressure loads acting on structures parallel to the track .....	23
6.1.1	General .....	23
6.1.2	Requirements .....	23
6.1.3	Conformity assessment .....	23
6.2	Train-induced air speeds acting on infrastructure components beside the track .....	23
6.3	Train-induced aerodynamic loads in the track bed .....	23
6.4	Train-induced air speed acting on people beside the track .....	23
6.5	Aerodynamically induced ballast projection .....	24
7	Methods and test procedures .....	24
7.1	Assessment of train-induced pressure variations beside the track .....	24
7.1.1	General .....	24
7.1.2	Pressure variations in the pressure field (reference case) .....	27
7.1.3	Pressure variations on surfaces parallel to the track .....	36
7.1.4	Effect of wind on loads caused by the train .....	44
7.2	Assessment of train-induced air flow beside the track .....	44
7.2.1	General .....	44
7.2.2	Slipstream effects on persons beside the track (reference case) .....	44
7.2.3	Slipstream effects on objects beside the track .....	48
7.3	Assessment of train-induced aerodynamic loads in the track bed .....	48
7.4	Assessment of running resistance .....	49
7.4.1	General .....	49
7.4.2	Full-scale tests .....	49

<b>Annex A (informative) Procedure for full-scale tests regarding train-induced air flow in the track bed .....</b>	<b>57</b>
<b>A.1 General .....</b>	<b>57</b>
<b>A.2 Track set-up .....</b>	<b>57</b>
<b>A.3 Vehicle configuration and test conditions .....</b>	<b>58</b>
<b>A.4 Instrumentation and data acquisition .....</b>	<b>58</b>
<b>A.5 Data processing .....</b>	<b>59</b>
<b>Bibliography .....</b>	<b>60</b>