

# DIN CEN/TR 16251:2016-08 (E)

Railway applications - Environmental conditions - Design guidance for rolling stock;  
English version CEN/TR 16251:2016

---

<b>Contents</b>		<b>Page</b>
European foreword.....		5
Introduction .....		6
1 Scope .....		6
2 Normative references .....		6
3 Terms and definitions .....		6
4 Overview - List of covered topics .....		8
5 Design guidance for vehicle.....		9
5.1 General.....		9
5.2 Temperature related .....		9
5.3 Snow and ice related .....		9
5.3.1 Ice related .....		9
5.3.2 Snow related .....		9
5.3.3 Anti-icing and de-icing .....		10
5.4 Humidity related .....		10
5.4.1 General.....		10
5.4.2 Test description.....		11
5.4.3 Evaluation criteria .....		11
5.5 Thermal insulation.....		12
5.6 Mechanical fixations of inner structures to the car body, have to be thermally interrupted by insulating spacers to avoid thermal bridges. Collision with animals.....		12
5.7 Condensation .....		12
5.7.1 General.....		12
5.7.2 Recommendations .....		13
5.7.3 Test description.....		13
5.7.4 Evaluation criteria .....		13
6 Design guidance for sub systems.....		13
6.1 Snow plough .....		13
6.1.1 General.....		13
6.1.2 Design guidance.....		13
6.1.3 Proposal for evaluation .....		14
6.2 Bogie and running gear.....		16
6.2.1 General.....		16
6.2.2 Winter conditions .....		16
6.2.3 Summer conditions .....		16
6.2.4 Design guidance.....		16
6.3 Brake components integrated in bogie.....		18
6.3.1 General.....		18
6.3.2 Design guidance.....		18
6.3.3 Proposal for evaluation .....		19
6.4 Compressed air .....		21
6.4.1 General.....		21
6.4.2 Design guidance.....		21
6.5 Sanding equipment.....		21
6.5.1 General.....		21

6.5.2	Design guidance .....	22
6.5.3	Proposal for evaluation .....	22
6.6	Suspension level control system .....	23
6.6.1	General .....	23
6.6.2	Design guidance .....	23
6.6.3	Proposal for evaluation .....	23
6.7	Tilting system.....	23
6.7.1	General .....	23
6.7.2	Design guidance .....	24
6.7.3	Proposal for evaluation .....	24
6.8	Flange lubrication system .....	24
6.8.1	General .....	24
6.8.2	Design guidance .....	25
6.9	Windscreen .....	25
6.9.1	General .....	25
6.9.2	Design guidance .....	25
6.9.3	Proposal for evaluation .....	25
6.10	Side mirrors/cameras.....	27
6.10.1	General .....	27
6.10.2	Design guidance .....	27
6.10.3	Proposal for evaluation .....	27
6.11	Lights.....	28
6.11.1	General .....	28
6.11.2	Design guidance .....	28
6.11.3	Proposal for evaluation .....	28
6.12	Horns.....	29
6.12.1	General .....	29
6.12.2	Design guidance .....	29
6.13	Doors.....	30
6.13.1	General .....	30
6.13.2	Design guidance .....	30
6.13.3	Proposal for evaluation .....	30
6.14	Moveable steps .....	31
6.14.1	General .....	31
6.14.2	Design guidance .....	31
6.14.3	Proposal for evaluation .....	31
6.15	Pantograph.....	32
6.15.1	General .....	32
6.15.2	Design guidance .....	32
6.15.3	Proposal for evaluation .....	33
6.16	Automatic couplers.....	33
6.16.1	General .....	33
6.16.2	Design guidance .....	34
6.16.3	Proposal for evaluation .....	34
6.17	Cooling systems.....	35
6.17.1	General .....	35
6.17.2	Design guidance .....	35
6.17.3	Proposal for evaluation .....	35
6.18	Traction.....	36
6.18.1	General .....	36
6.18.2	Design guidance .....	36
6.19	Battery .....	37
6.19.1	General .....	37

6.19.2 Design guidance..... 37  
6.20 Toilet and water systems ..... 38  
6.20.1 General..... 38  
6.20.2 Design guidance..... 38  
6.20.3 Proposal for evaluation ..... 38  
6.21 External cabinets, boxes for equipment, cables and connectors..... 40  
6.21.1 General..... 40  
6.21.2 Design guidance..... 40  
6.21.3 Proposal for evaluation ..... 40  
Annex A (informative) Examples of protection for electrical and pneumatic connections ..... 41  
Annex B (informative) Examples for snow ploughs..... 43  
Bibliography..... 45