

DIN EN 15746-2:2011-12 (E)

Railway applications - Track - Road-rail machines and associated equipment - Part 2: General safety requirements (inclu des Amendment A1:2011)

Contents		Page
Foreword		5
Introduction		6
1	Scope	7
2	Normative references	8
3	Terms and definitions	12
4	List of significant hazards	12
5	General safety requirements and/or measures	12
5.1	General	12
5.2	Access and egress to and from working places	13
5.2.1	Cabs	13
5.2.2	Working places, places for control and maintenance outside of cabs	14
5.2.3	Walkways on the machine	14
5.3	Ergonomics	14
5.4	Requirements for cabs	15
5.4.1	General	15
5.4.2	Minimum dimensions in cabs	15
5.4.3	Cab floors	15
5.4.4	Emergency exit	15
5.4.5	Climatic conditions in cab	15
5.4.6	Protection from dust	15
5.4.7	Visibility from cabs and other permanent work places	16
5.4.8	Windows	18
5.4.9	Storage for instruction handbook	19
5.5	Seats	19
5.5.1	Seats for the operator(s)	19
5.5.2	Additional seats	19
5.6	Standing places	19
5.7	Edges and corners	19
5.8	Pipes and hoses	19
5.9	Communications between work positions	20
5.10	Prevention of derailment	20
5.10.1	General	20
5.10.2	Lifeguards	20
5.11	Stability and measures preventing overturning	20
5.11.1	Stability against overturning in road configuration	20
5.11.2	Proof of stability against overturning, machine stationary in rail configuration	20
5.11.3	Prevention of derailment during running and when moving along the track in working configuration	22
5.11.4	Rated capacity indicator (RCI)	24
5.12	Emergency stopping devices	24
5.12.1	Emergency stopping devices for movement of the machine and working equipment	24
5.12.2	Action of emergency stopping devices	24
5.13	Moving parts and materials	25
5.14	Operators controls and indicators	25
5.14.1	General requirement	25

5.14.2	Starting system	27
5.14.3	Inadvertent activation	27
5.14.4	Pedals	27
5.14.5	Protection against uncontrolled motion in working configuration	27
5.14.6	Control panels and indicators	27
5.14.7	Remote controls	27
5.15	Thermal hazards	28
5.16	Electrical system	28
5.16.1	Electrical equipment	28
5.16.2	Disconnection devices	29
5.16.3	Working environment	29
5.16.4	Conductors, cables and wiring practices	29
5.16.5	Batteries	29
5.16.6	Catenaries	29
5.16.7	Equi-potential bonding	31
5.16.8	Antennae	31
5.17	Machine safety requirements related to electromagnetic compatibility	31
5.18	Emission of gas and particles	31
5.19	Pressurised systems	32
5.20	Fuel tanks and hydraulic tanks	32
5.21	Noise	32
5.22	Vibration	33
5.22.1	General	33
5.22.2	Whole body vibration	33
5.22.3	Hand arm vibration	33
5.23	Protection from the risks of fire	33
5.23.1	General risk assessment	33
5.23.2	Fire fighting equipment	33
5.23.3	Material requirements	33
5.23.4	Fire extinguishing system	34
5.24	Braking systems	34
5.24.1	General	34
5.24.2	Special case for category 8 machines	35
5.24.3	Holding on gradients	35
5.24.4	Braking of trailed machines/vehicles	36
5.24.5	Air continuous service brake for hauled machines/vehicles	36
5.25	Lighting	36
5.26	Warning systems	37
5.27	Maintenance	37
5.27.1	General	37
5.27.2	Frequent maintenance	37
5.27.3	Support devices	37
5.27.4	Unauthorised access to the engine compartment	37
5.28	Safe handling	38
6	Additional safety requirements or measures for specific machine functions	38
6.1	Conveyors	38
6.2	Cranes and lifting devices fixed on the machine	38
6.3	Transport of loads by machines used for lifting	39
6.4	Elevating work platforms	39
7	Verification of the conformity to the requirements and/or particular safety measures	39
7.1	General	39
7.2	Methods of examination	39
7.2.1	General	39
7.2.2	Visual check	39
7.2.3	Measurement	39
7.2.4	Functional test	39
7.2.5	Load test(s)	39
7.2.6	Specific verification/measurements and other controls	39
8	Information for use	40

8.1	General	40
8.2	Instruction handbook	40
8.2.1	Specific information in instruction handbook	40
8.2.2	Restrictions of use	41
8.2.3	Mass of the machine in working condition	42
8.2.4	Stability of the machine	42
8.2.5	Conformance to the lateral limit of work	42
8.2.6	Opening and closing the machine	42
8.2.7	Locking of tools and equipment	42
8.2.8	Devices to prevent access to an operating track	42
8.2.9	Work places situated outside the running gauge	43
8.2.10	Warning systems	43
8.2.11	Testing of warning systems	43
8.2.12	Information for maintenance	43
8.2.13	Trailing loads	43
8.2.14	Vibration	44
8.3	Warning signs and written warnings	45
8.4	Marking	46
Annex A (normative) List of significant hazards		47
Annex B (normative) Check list for conformity		50
Annex C (normative) Noise test code (grade of accuracy 2)		56
C.1	Scope	56
C.2	Definitions	56
C.3	Determination of the emission sound pressure level at the work station or other specified positions	56
C.4	Sound power level determination	56
C.5	Installation and mounting conditions	57
C.6	Operating conditions	57
C.7	Measurement uncertainties	60
C.8	Information to be recorded	60
C.9	Information to be reported	60
C.10	Declaration and verification of noise emission values	61
Annex D (informative) Structure of European Standards for track construction and maintenance machines		63
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive Machinery 98/37/EC, amended by 98/79/EC		64
Annex ZB (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC		65
Annex ZC (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC		66
Bibliography		67