

DIN EN 12111:2015-10 (E)

Tunnelling machines - Road headers and continuous miners - Safety requirements

Contents		Page
Foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms and definitions	9
4	List of significant hazards	10
4.1	General	10
5	Safety requirements and/or protective measures	13
5.1	General	13
5.2	Specific requirements	13
5.2.1	Contact surfaces	13
5.2.2	Stability	13
5.2.3	Ladders, access ways and platforms	14
5.3	Control station	14
5.3.1	General requirements	14
5.3.2	Falling objects and ejected material	14
5.3.3	Cab	14
5.3.4	Visibility	15
5.4	Guards	15
5.5	Control devices and systems	15
5.5.1	General	15
5.5.2	Safety and reliability of control systems	16
5.5.3	Design of control systems	16
5.5.4	Warning system	17
5.5.5	Failure of power supply	17
5.5.6	Remote control	17
5.5.7	Automatic profiling and guidance systems	18
5.5.8	Braking, stopping and holding	18
5.6	Dust and gas control	18
5.6.1	Dust control	18
5.6.2	Exhaust gas control	19
5.6.3	Gas monitoring	19
5.7	Noise	20
5.7.1	General	20
5.7.2	Noise reduction at source at the design stage	20
5.7.3	Information on residual risk	20
5.8	Electrical requirements	20
5.8.1	General	20
5.8.2	Control of electrical power supply	20
5.8.3	Portable equipment, accessory and lighting circuits	21
5.8.4	Monitoring of circuits	21
5.8.5	Cables	21
5.8.6	Transformers	22
5.8.7	Bonding	22
5.8.8	Rechargeable batteries	22
5.8.9	Electromagnetic compatibility	22

5.9	Lighting	22
5.9.1	General	22
5.9.2	Working areas	22
5.9.3	Travelling and maintenance areas	22
5.10	Retroreflective plates	23
5.11	Hydraulic and pneumatic systems	23
5.11.1	Hydraulic systems	23
5.11.2	Pneumatic systems	23
5.12	Fire protection	23
5.12.1	General	23
5.12.2	Fixed fire extinguishing systems	24
5.12.3	Portable fire extinguishers	24
5.13	Ground support equipment	24
5.13.1	Installing elements for ground support	24
5.13.2	Drilling for bolting	24
5.14	Retrieval, towing, transportation and lifting	25
5.14.1	General	25
5.14.2	Retrieval and towing	25
5.14.3	Transportation	25
5.14.4	Lifting	25
5.15	Instruction storage	25
5.16	Fuel and fluid storage	25
5.16.1	General	25
5.16.2	Fuel system	25
5.17	Maintenance	25
6	Verification of safety requirements and/or protective measures	26
7	Information for use	29
7.1	General	29
7.2	Signals and warning devices	30
7.3	Accompanying documents	30
7.3.1	General	30
7.3.2	General information	31
7.3.3	Operating instructions	32
7.3.4	Maintenance instructions	33
7.4	Marking	34
Annex A	(normative) Noise test code	35
A.1	Scope	35
A.2	A-weighted emission sound pressure levels at workstations	35
A.3	A-weighted sound power level determination	36
A.3.1	A-weighted sound power levels	36
A.3.2	Measurement procedure for large machines	36
A.4	Installation and mounting conditions of the machines	36
A.5	Test conditions of the machine	36
A.5.1	General	36
A.5.2	Operating conditions at the place of manufacturer	37
A.5.3	Operating conditions in a tunnel environment	37
A.6	Information to be recorded and reported	37
A.7	Declaration and verification of noise emission values	38
Annex B	(informative) Figures	39
Annex ZA	(informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	42
Bibliography	43