

**Tunnelbouwmachines.
Continu-graafmachines.
Veiligheidseisen**

Publikatie uitsluitend voor commentaar

Tunnelling machines. Road headers, continous miners
and impact rippers. Safety requirements

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Commentaar voor 15 januari 1996

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prEN 12111 Tunnelling machines. Road headers, continous miners and impact rippers. Safety requirements

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DRAFT
prEN 12111

NORME EUROPEENNE

EUROPÄISCHE NORM

August 1995

ICS

Descriptors

English version

Tunnelling machines - Road headers, continuous miners and impact rippers - Safety requirements

Machines pour la construction de tunnels - Machines à attaque ponctuelle, mineurs continus, brise-roche - Règles de sécurité

Tunnelbaumaschinen - Teilschnittmaschinen, continuous miners und Schlagkopfmachines - Sicherheitstechnische Anforderungen

This draft European Standard is submitted to the CEN members for CEN enquiry. It has been drawn up by Technical Committee CEN/TC 151.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Foreword

This European Standard was prepared by CEN/TC 151 "Construction equipment and building material machines - Safety".

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directives.

For relationship with EU-Directives, see informative Annex Z, which is an integral part of this standard.

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0 Introduction

This European Standard has been prepared to be a harmonized standard to provide one means of conforming with the essential safety requirements of the Machinery Directive and associated EFTA Regulations.

Road headers, continuous miners and impact rippers designed and constructed in accordance with the safety requirements of a harmonized standard will be presumed, to comply with all relevant essential safety requirements of the Machinery Directive and associated EFTA Regulations.

The extent to which hazards are covered is indicated in the scope of this standard.

In particular, all machinery shall comply as appropriate with EN 292 for hazards which are not covered by this standard.

Those hazards, which are relevant to all mechanical, electrical, hydraulic, pneumatic and other equipment of machinery and which are dealt with in standards for common use (type A-, B1- and B2 standards) are not contained in this standard. Reference to pertinent standards of this kind is made where such standards are applicable and necessary.

1 Scope

1.1 This standard applies to road headers, continuous miners and impact rippers primarily employed in tunnelling and mining. Their application in explosive atmospheres environment is covered by the safety requirements according to Annex B in addition to those of clause 5.5.3.2.

Road headers and continuous miners are self-propelled tunnel driving or mining machines which excavate the rock in sections by means of their cutting or excavating tools. They may be fitted with loading and transport equipment.

Impact rippers are self-propelled tunnel driving machines which excavate the rock in sections by means of their ripper Tools. They may be fitted with loading and transport equipment.

1.2 This standard deals with the significant hazards specific to the machines mentioned in clause 1.1, when used under the conditions foreseen by the manufacturer (see clause 4)

1.3 This standard applies to machines manufactured after...

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 3 Fire-fighting - Portable fire extinguishers

EN 292-1 Safety of machinery - Basic concepts - General principles for design - Part 1: Basic terminology, methodology

EN 292-2	Safety of machinery - Basic concepts - General principles for design - Part 2: Technical principles and specifications
EN 418	Safety of machinery - Emergency stop equipment
EN 563	Safety of machinery - Temperature of touchable surfaces
prEN 982	Safety requirements for fluid power systems and components - Hydraulics
prEN 983	Safety requirements for fluid power systems and components - Pneumatics
EN 22867	Earth moving machinery - Access
EN 23411	Earth moving machinery - Human physical dimensions of operators and minimum operator space envelope
prEN 50099-1	Safety of machinery - Indicating, marking and actuating principles - Part 1: Visual, audible and tactile signals
EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 60439	Low-voltage switch gear and control gear assemblies
EN 60947	Low-voltage switch gear and control gear
ENV 1070	Safety of machinery - Terminology
IEC 529:1976	Classification of degrees of protection provided by enclosures

3 Definitions

For the use of this standard the concepts contained in ENV 1070 "Safety of Machinery, Terminology" applies.

Additional concepts, specifically needed for this type of machinery are added below:

- 3.1 **RH:** An abbreviation covering all machines according to clause 1.1 for which common specifications apply.
- 3.2 **Control point:** Location on a RH from where the functions of the RH can be controlled.
- 3.3 **Servicing point:** Any location on a RH where servicing and maintenance is carried out.
- 3.4 **Erecting device:** Device on a RH for handling and placement of lining elements.
- 3.5 **Operator:** The person responsible for operating the RH.

4 List of Hazards

This list contains all hazards identified by risk assessment as significant for RH's and which require action to eliminate or reduce risk

- | | |
|--|---|
| 4.1 Mechanical hazards | see clause: |
| a) crushing or shearing | 5.3, 5.4.5.2, 6.1.2, 6.2 |
| b) cutting | 5.1.3.1 |
| c) drawing-in or trapping | 5.1.5, 5.3, 6.1.2, 6.2 |
| d) high-pressure fluid injection | 5.1.4, 5.8.6 |
| e) loss of stability | 5.1.7 |
| f) slip, trip and fall | 5.1.8 |
|
 | |
| 4.2 Electrical hazards | |
| a) direct or indirect electrical contact | 5.4.5.1, 5.4.6, 5.8.1,
5.8.2.1, 5.8.2.2,
5.8.4, 5.8.5 |
| b) approach of persons to live parts,
especially in the range of high voltage | 5.4.5.1, 5.4.6, 5.8.1
5.8.2.1, 5.8.2.2,
5.8.4, 5.8.5 |
| c) electrostatic phenomena | 5.8.1, 5.8.2.3 |
| d) external influences on electrical equipment | 5.4.1, 5.8.1 |
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| 4.3 Thermal hazards | 5.1.3.2 |
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| 4.4 Noise hazards | 5.2.1, 5.7, 6.2, 6.4.1 |
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| 4.5 Vibration hazards | 5.2.1, 6.4.1 |
|
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| 4.6 Hazards generated by materials and substances | |
| a) inhalation of harmful gases | 5.1.2, 5.5.2, 5.5.3.3,
5.7.3, 5.7.4, 6.2.3 |
| b) inhalation of dusts | 5.2.3, 5.4.3, 5.5.1,
6.2.3 |
| c) fire and explosion | 5.1.2, 5.5.3, 5.7.3,
5.10, 6.2.3, 7.1, 7.2 |
| d) rock outbreaks | 5.1.8 |
|
 | |
| 4.7 Hazards generated by neglecting ergonomic principles | |
| a) unhealthy postures or excessive efforts | 5.2.1, 5.2.2 |
| b) failure to use personal safety equipment | 5.2.1, 5.4.1 |
| c) inadequate local lighting | 5.2.1, 5.5 |
| d) human errors | 5.4.2 |
|
 | |
| 4.8 Hazards caused by failure of energy supply | |
| a) failure of energy supply | 5.4.3, 5.4.7, 5.8.6 |
| b) failure of control system | 5.4.3, 5.4.4 |

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