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Machine tools - Safety - Machining centres
CONSOLIDATED TEXT

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12417:2001+A2:2009 sisaldab Euroopa standardi EN 12417:2001+A2:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 12417:2001+A2:2009 consists of the English text of the European standard EN 12417:2001+A2:2009.
Standard on kinnitatud Eesti Standardikeskuse 27.03.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 27.03.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 11.02.2009.	Date of Availability of the European standard text 11.02.2009.
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ICS 25.040.10

Võtmesõnad: installa, machine tools, machining centers, maintenance, noise measurements, occupational safety, operating stations, protection against danger, protection devices, safety, safety requirements, set up, transport, working places, workplace safety

EUROPEAN STANDARD

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English Version

Machine tools - Safety - Machining centres

Machines-outils - Sécurité - Centres d'usinage

Werkzeugmaschinen - Sicherheit - Bearbeitungszentren

This European Standard was approved by CEN on 9 June 2001 and includes Amendment 1 approved by CEN on 3 February 2006 and Amendment 2 approved by CEN on 29 December 2008.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 12417:2001+A2:2009) has been prepared by Technical Committee CEN/TC 143 "Machine tools - Safety", the secretariat of which is held by SNV.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2006-02-03 and Amendment 2, approved by CEN on 2008-12-29.

This document supersedes EN 12417:2001.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩ and ⟨A2⟩ ⟨A2⟩.

Annex A is normative. Annexes B to D and ZA ⟨A2⟩ and ZB ⟨A2⟩ are informative.

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 EC Directive(s).

⟨A2⟩ For relationship with EC Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A2⟩

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European Standard is a type C standard as stated in EN 292–1.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence.

Machining centres present a wide range of hazards, not least from their wide application as rotating tool, 'stationary' workpiece machine tools, for general purpose cutting of cold metal work material.

Protection of operators and other persons from contact with moving cutting tools, especially when being rapidly rotated in the spindle, or being swung from a tool magazine to the spindle during power-operated tool changing, or from contact with fast–moving workpieces, is of great importance.

When power–operated mechanisms are provided for workpiece transfer, they can also create hazardous situations during loading/unloading and workpiece alignment or clamping.

Total enclosure of the work zone using guards during cutting is practicable for smaller machines. The requirements for access to the work zone of large machines used for the processing of a wide range of workpiece configurations can require that operators are safeguarded by other means (e.g. perimeter fencing, protective devices at the operating position).

Pendant controls enable operators to move around the machine, especially large machines, and to view the work zone, the load/aligning, clamping, cutting, or unloading operations, maneuvering the pendant control as they move.

The significant hazards covered by this standard are those listed in clause 4. The safety requirements and/or protective measures to prevent or minimize those hazards identified in Table 1 and procedures for verification of these requirements or measures are found in clause 5.

The figures in annex C are examples only and are not intended to illustrate the only interpretation of the text.

1 Scope

1.1 This standard specifies the technical safety requirements and protective measures to be adopted by persons undertaking the design, construction and supply (including installation and dismantling, with arrangements for transport and maintenance) of machining centres (see 3.1).

1.2 This standard takes account of intended use including reasonably foreseeable misuse, maintenance, cleaning, and setting operations. It presumes access to the machine from all directions. It describes means to reduce risks to operators and other exposed persons.

1.3 This standard also applies to the workpiece transfer devices when they form an integral part of the machine.

1.4 This standard deals with significant hazards relevant to machining centres when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4).

1.5 Hazards arising from other metal working processes (e.g. grinding, turning, forming, EDM, laser processing) are covered by other standards (see Bibliography).

1.6 This standard applies to machines which are manufactured after (its date of publication).

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 (including amendments).

EN 292-1:1991, *Safety of machinery - Basic concepts, general principles for design – Part 1: Basic terminology, methodology*

EN 292-2:1991 and EN 292-2/A1:1995, *Safety of machinery - Basic concepts, general principles for design – Part 2: Technical principles and specifications*

EN 294:1992, *Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs*

EN 349:1993, *Safety of machinery – Minimum gaps to avoid crushing of parts of the human body*

EN 547:1996, *Safety of machinery – Human body measurements –*
Part 1: Principles for determining the dimensions required for openings for whole body access into machinery
Part 2: Principles for determining the dimensions required for access openings
Part 3: Anthropometric data

EN 574:1996, *Safety of machinery - Two hand control devices – Functional aspects – Principles for design*

EN 614, *Safety of machinery - Ergonomic design principles –*
Part 1: Terminology and general principles
Part 2: Interaction between machinery design and work tasks

EN 626-1:1994, *Safety of machinery – Reduction of risks to health from hazardous substances emitted by machinery – Part 1: Principles and specifications for machinery manufacturers*

EN 894:1997, *Safety of machinery – Ergonomics requirements and data for the design of displays and control actuators –*
Part 1: Human interactions
Part 2: Displays

EN 894-3:2000, *Safety of machinery – Ergonomics requirements and data for the design of displays and control actuators – Part 3: Control actuators*

EN 953:1997, *Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards*

EN 954-1:1996, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design*

EN 982:1996, *Safety of machinery - Safety requirements for fluid power systems and their components - Hydraulics*

EN 983:1996, *Safety of machinery - Safety requirements for fluid power systems and their components - Pneumatics*

EN 999:1998, *Safety of machinery – The positioning of protective equipment in respect of approach speeds of parts of the human body*

prEN 1005:1998, *Safety of machinery – Human physical performance –*
Part 1: Terms and definitions
Part 2: Manual handling of machinery and component parts of machinery
Part 3: Recommended force limits for machinery operation

EN 1037:1995, *Safety of machinery – Prevention of unexpected start-up*

EN 1050:1996, *Safety of machinery - Principles for risk assessment*

EN 1088:1995, *Safety of machinery - Interlocking devices associated with guards – Principles for design and selection*

EN 1127–1:1997, *Explosive atmospheres - Explosion prevention and protection – Part 1: Basic concepts and methodology*

EN 1760–1:1997, *Safety of machinery - Pressure sensitive protective devices – Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors*

EN 1837:1999, *Safety of machinery – Integral lighting of machines*

EN 60529:1991, *Specification for degrees of protection provided by enclosures (IP code)*

EN 60825-1:1994, *Safety of laser products – Equipment classification, requirements and user's guide*

EN ISO 3744:1995, *Acoustics – Determination of sound power level of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane*

EN ISO 3746:1995, *Acoustics – Determination of sound power level of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane*

EN ISO 4871:1997, *Acoustics – Declaration and verification of noise emission values of machinery and equipment*

EN ISO 9614-1:1995, *Acoustics – Determination of sound power level of noise sources using sound intensity – Part 1: Measurement at discrete points*

EN ISO 11202:1995, *Acoustics – Noise emitted by machinery and equipment – Measurement method of emission sound power levels at the work station and at other specified positions – Survey method in situ*

EN ISO 11204:1996, *Acoustics - Noise emitted by machinery and equipment – Method requiring environmental corrections*

prEN ISO 14122:1999, *Permanent means of access to machines and industrial plants -*
Part 2: Working platforms and gangways
Part 3: Stairways, stepladders and guard-rails

prEN 13478:1999, *Safety of machinery – Fire prevention and protection*

EN ISO 11688-1:1998, *Acoustics – Recommended practice for the design of low–noise machinery and equipment – Part 1: Planning*

ISO/TR 11688-2:1998, *Acoustics – Recommended practice for the design of low–noise machinery and equipment – Part 2: Introduction to the physics of low-noise design*

〚A1〛 EN ISO 15641, *Milling cutters for high speed machining — Safety requirements (ISO 15641:2001)* 〚A1〛

EN 50081–2:1993, *Electromagnetic compatibility – Generic emission standard – Part 2: Industrial environment*

EN 60204-1:1997, *Safety of machinery - Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:1997)*

EN 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:1999)*

EN 61496-1: 1997, *Safety of machinery - Electrosensitive protective equipment – Part 1 - General requirements and tests (IEC 61496-1:1997)*

IEC 61496-2:1997, *Safety of machinery - Electro-sensitive protective equipment – Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

ISO 2806:1994, *Industrial automation systems – Numerical control of machines – Vocabulary*