

# SVENSK STANDARD

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### Verktygsmaskiner – Transfer- och specialmaskiner – Säkerhet

### Safety of machine tools – Transfer and special-purpose machines

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Denna standard ersätter SS-EN 14070, utgåva 1.

The European Standard EN 14070:2003+A1:2009 has the status of a Swedish Standard. This document contains the official English version of EN 14070:2003+A1:2009.

This standard supersedes the Swedish Standard SS-EN 14070, edition 1.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14070:2003+A1**

February 2009

ICS 25.080.01

Supersedes EN 14070:2003

English Version

## Safety of machine tools - Transfer and special-purpose machines

Sécurité des machines-outils - Machines transfert et machines spéciales

Sicherheit von Werkzeugmaschinen - Transfer- und Einzweck- oder Sondermaschinen

This European Standard was approved by CEN on 24 July 2003 and includes Amendment 1 approved by CEN on 29 December 2008.

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**SS-EN 14070+A1:2009 (E)**

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## Foreword

This document (EN 14070:2003+A1:2009) 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of an identical text or by endorsement, at the latest by August 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.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 2008-12-29.

This document supersedes EN 14070:2003.

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

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential safety requirements of the Machinery Directive to determine safety for new transfer and special purpose machines.

**A1** For relationship with EC Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A1**

Annexes A and D are normative. Annexes B and C are informative.

This document includes a Bibliography.

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.

## SS-EN 14070+A1:2009 (E)

### 0 Introduction

This European Standard is a type C standard as stated in 6.3.2 of EN 1070:1998.

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.

Transfer and special purpose machines present a wide range of hazards due to the variety of processes and configurations with possible obstructions to vision on these machines, in particular, those hazardous events which result from contact with:

- Moving tools especially when being rapidly rotated in spindles;
- Fast moving machine parts;
- Fast moving workpieces;
- Power operated mechanisms for workpiece handling, load or unload.

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

A list of standards related to EN 14070 is given in the bibliography.

### 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 information which must be provided for installation and dismantling, with arrangements for transport and maintenance) of transfer and special purpose machines (see 3.1). These machines are designed to process only a pre-specified metal or analogous material workpiece, or limited family of similar workpieces by means of a predetermined sequence of machining operations and process parameters.

**1.2** This standard takes account of intended use, including reasonably foreseeable misuse, maintenance, cleaning, and setting operations. It specifies access arrangements to machining positions and manual load/unload stations (see 3.4). 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 transport devices for workpiece load/unload when they form an integral part of the machine.

**1.4** This standard deals with significant hazards relevant to transfer and special purpose machines when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). The safety requirements and/or protective measures to prevent or minimise those hazards identified in Table 1 and procedures for verification of these requirements or measures are found in clause 5. Safety requirements and/or measures are not specified for: Fire and Explosion

**1.5** Where machines employ processes which are covered by other standards (e.g. grinding, turning, forming, EDM, laser processing), the requirements of those standards should be applied (see Bibliography).

**1.6** This standard applies to machines which are manufactured after publication of this standard by CEN.



## 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, *Safety of machinery - Basic concepts, general principles for design – Part 2: Technical principles and specifications.*

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

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

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

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

EN 614-1, *Safety of machinery - Ergonomic design principles – Part 1: Terminology and general principles.*

EN 614-2, *Safety of machinery - Ergonomic design principles – Part 2: Interactions between the design of machinery and work tasks.*

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

EN 811:1996, *Safety of machinery - Safety distances to prevent danger zones being reached by the lower limbs.*

EN 894-1, *Safety of machinery - Ergonomic requirements for the design of displays and control actuators – Part 1: General principles for human interactions with displays and control actuators.*

EN 894-2, *Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 2: Displays.*

EN 894-3:2000, *Safety of machinery – Ergonomics requirements 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, *Safety of machinery - Safety-related parts of control systems – Part I: 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, *Safety of machinery – The positioning of protective equipment in respect of approach speeds of parts of the human body.*

## **SS-EN 14070+A1:2009 (E)**

EN 1005-1, *Safety of machinery – Human physical performance – Part 1: Terms and definitions.*

EN 1005-2, *Safety of machinery – Human physical performance – Part 2: Manual handling of machinery and component parts of machinery.*

EN 1005-3, *Safety of machinery – Human physical performance – 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 1070:1998, *Safety of machinery – Terminology.*

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

EN 1760–1, *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, *Safety of machinery – Integral lighting of machines.*

EN ISO 3744, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994).*

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

EN ISO 4871, *Acoustics – Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996).*

EN ISO 7250, *Basic human body measurements for technological design (ISO 7250:1996).*

EN ISO 9614-1, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 1: Measurement at discrete points (ISO 9614-1:1993).*

EN ISO 11202:1995, *Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at a work station and at other specified positions - Survey method in situ (ISO 11202:1995).*

EN ISO 11204:1995, *Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at a work station and at other specified positions - Method requiring environmental corrections (ISO 11204:1995).*

EN ISO 11688-1, *Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning (ISO/TR 11688-1:1995).*

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

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

EN 60825-1:1994/A1, *Safety of laser products – Part 1: Equipment classification, requirements and user's guide; Amendment A1 (IEC 60825-1:1993/A1:1997) / Note: Endorsement notice*

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

EN 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:1997, modified)*.

EN 61310-3, *Safety of machinery – Indication, marking and actuation – Part 3: Requirements for the location and operation of actuators (IEC 61310-3:1999)*.

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

IEC 61496-2, *Safety of machinery – Electro-sensitive protective equipment – Part 2 – Particular requirements for equipment using active opto-electronic protective devices*.

### **3 Terms and definitions**

For the purposes of this European Standard, the terms and definitions given in EN 1070 apply. Additional terms and definitions specifically needed for this document are added below.

#### **3.1**

##### **transfer and special purpose machines**

machine designed to process only a pre-specified workpiece or family of workpieces, by means of a pre-determined sequence of machining operations and process parameters (see Figures C.1 and C.2)

NOTE These machines can include one or more of the following elements:

- station(s) incorporating unit(s) (see 3.4 and 3.5 below);
- transport system(s) for the workpiece;
- clamping devices;
- metal working fluid system(s);
- swarf/chip removal system(s);
- measurement and test systems.

#### **3.2**

##### **work zone**

space within which the machine mechanisms are located and the process(es) are performed

#### **3.3**

##### **machine working cycle**

period of time between the start of process on one workpiece and the start of process on the next workpiece after a transfer

NOTE This is determined by the longest individual station time.

#### **3.4**

##### **station**

term applied to the fixed positions within a machine at which workpieces are located during the processing portion of the machine working cycle

NOTE Stations are normally identified by sequential numbering e.g.:

- Station 1 – Load station
- Station 2 – Machining station
- Station 3 – Gauging station
- Station 4 – Idle station
- Station XX – Unload station

The term station also covers the fixtures, units, heads and other mechanisms associated with the process performed at a particular station (see Figures C.3, C.4 and C.5).