

SLOVENSKI STANDARD

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Stroji in obrati za proizvodnjo, obdelavo in predelavo ravnega stekla - Varnostne zahteve - 11. del: Vrtalni stroji

Machines and plants for the manufacture, treatment and processing of flat glass - Safety requirements - Part 11: Drilling machines

Maschinen und Anlagen zur Herstellung, Be- und Verarbeitung von Flachglas - Sicherheitsanforderungen - Teil 11: Bohrmaschinen

Machines et installations pour la production, le façonnage et la transformation du verre plat - Exigences de sécurité - Partie 11 : Machines de perçage

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ICS:

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13035-11:2006+A1

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English Version

**Machines and plants for the manufacture, treatment and
processing of flat glass - Safety requirements - Part 11: Drilling
machines**

Machines et installations pour la production, le façonnage
et la transformation du verre plat - Exigences de sécurité -
Partie 11: Machines de perçage

Maschinen und Anlagen zur Herstellung, Be- und
Verarbeitung von Flachglas - Sicherheitsanforderungen -
Teil 11: Bohrmaschinen

This European Standard was approved by CEN on 24 May 2006 and includes Amendment 1 approved by CEN on 24 January 2010.

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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 13035-11:2006+A1:2010) has been prepared by Technical Committee CEN/TC 151 "Construction equipment and building material machines — Safety", the secretariat of which is held by DIN.

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 September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1, approved by CEN on 2010-01-24.

This document supersedes EN 13035-11:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **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 requirements of EU Directive(s).

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

It is one of a series concerning machinery for the treatment and processing of flat glass (see 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, Croatia, 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.

EN 13035-11:2006+A1:2010 (E)**Introduction**

This European Standard is a type C standard as stated in EN ISO 12100-1.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this European Standard.

When provisions of this type C standard are different from those stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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1 Scope

1.1 This European Standard contains the requirements for stationary machines for the drilling of flat glass, using a powered rotating tool. Stationary machines are classified into:

- a) manual;
- b) semi-automatic;
- c) automatic single-head or multi-head;
- d) fully automatic.

1.2 ^{A1} This European Standard deals with the significant hazards, hazardous situations and events relevant to drilling machines for flat glass when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). ^{A1} This European Standard specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards during commissioning, the operation and maintenance. ^{A1} Safety requirements and/or protective measures are given in Clause 5. When references are made to B level standards such as EN 953, EN 983, EN 999, EN 1037, EN 1088, EN 60204-1, EN ISO 13850 and EN ISO 13857, the manufacturer should carry out an adequate risk assessment for the requirements thereof where choice is necessary. ^{A1}

1.3 This European Standard does not address the safety requirements for conveyor belts, rollers (see EN 619) or other means of transporting the glass to and from the drilling machine (see e.g. EN 13035-5).

1.4 This European Standard is not applicable to drilling machines which are manufactured before the date of publication of this European Standard by CEN.

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2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

^{A1} ~~deleted text~~ ^{A1}

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

^{A1} ~~deleted text~~ ^{A1}

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

^{A1} EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)* ^{A1}

EN 60825-1:1994, *Safety of laser products — Part 1: Equipment classification, requirements and user's guide (IEC 60825-1:1993)*

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EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals* (IEC 61310-1:2007) ^(A1)

EN ISO 3744:2009 ^(A1), *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 3746:2009, *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, including Cor 1:1995) ^(A1)

EN ISO 3747:2009, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Comparison method for use in situ* (ISO 3747:2000)

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment* (ISO 4871:1996)

EN ISO 11201:2009, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane* (ISO 11201:1995, including Cor 1:1997)

EN ISO 11202:2009, *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) ^(A1)

EN ISO 11204:2009, *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, including Cor 1:1997) ^(A1)

EN ISO 11688-1:2009 ^(A1), *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning* (ISO/TR 11688-1:1995)

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology* (ISO 12100-1:2003)

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles* (ISO 12100-2:2003)

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design* (ISO 13849-1:2006)

EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design* (ISO 13850:2006)

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs* (ISO 13857:2008) ^(A1)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

3.1

manual machine

machine where the tool is applied to the workpiece by the direction of the operator

3.2**semi-automatic machine**

machine where the workpiece is loaded and unloaded by the operator and some of the intermediate machining operations are under the control and guidance of the operator.

NOTE During the machining operations, the operator does not come into contact with the workpiece

3.3**automatic machine**

machine where the workpiece is loaded and unloaded by the operator, but all the intermediate machining operations are carried out without operator intervention

3.4**fully automatic machine**

machine where the workpiece is presented to and removed from the tools automatically and all the intermediate machining operations are carried out without intervention of the operator

4 List of significant hazards

This clause contains the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for drilling machines and which require action to eliminate or reduce the risk.

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Table 1 — List of significant hazards

Hazards		Danger zone/dangerous items	Preventive measures: see clause
4.1	crushing	during down stroke of the clamp	5.4; 5.7; 7.3.8
4.2	cutting or severing	during drilling operation	5.4; 5.7
4.3	entanglement	during drilling and glass positioning operations	5.4; 5.7
4.4	drawing-in or trapping	during drilling and glass positioning operations	5.4; 5.7
4.5	impact	during down stroke of the clamp	5.4; 5.7; 7.3.8
4.6	friction or abrasion	during drilling operation	5.4; 5.7
4.7	electrical	direct or indirect contact	5.5; 5.8; 5.9; 7.3.5
4.8	resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	coolants	5.2; 7.3.6
4.9	biological and micro-biological (viral or bacterial)	coolants	5.2; 7.3.6
4.10	neglected use of personal protection equipment	all operational phases of the machine	5.8; 7.3.3
4.11	impossibility of stopping in the best possible conditions	during operation of the machine	5.6
4.12	ejected objects or fluids	during drilling operation	5.2; 5.4
4.13	unexpected start-up by restoration of energy supply after interruption, errors made by the operator	all dangerous movements	5.8; 5.9
4.14	hazards by noise may result in hearing damage, tinnitus, stress, in accidents due to interference with speech communication and with the perception of acoustic signals	during drilling operation	5.10; 7.3.2
4.15	lasers	laser centring device	5.3; 7.2.1; 7.3.7

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5 Safety requirements and/or protective measures

5.1 General

Machinery shall comply with the safety requirements and/or protective measures of this clause.

In addition, the machine shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant which are not dealt with by European Standard (e.g. sharp edges).

A1 *deleted text* A1

Where the means of reducing the risk is by the arrangement of the installed machine or by a safe system of work, the manufacturer shall include in the information for use a reference to the reduction means to be provided, and to any limiting value of the requirement and, if appropriate, to the means of verification.

5.2 Cutting fluids

Splash guards are required to prevent the operator being splashed with coolant.

NOTE Tests of coolants see 7.3.6.

5.3 Laser centring device

Where a laser centring device is used, safety measures shall be taken in accordance with EN 60825-1:1994.

NOTE 1 Warning signs see 7.2.1.

NOTE 2 Criteria for the use see 7.3.7.

5.4 Guards and screens

The guards and screens shall be made according to EN 953.

The transparent material, if provided, shall be made of laminated glass, polyacrylic or polycarbonate to the standards of thickness, specification etc. A1 Where fixed guards are used, their fixing systems shall remain attached to the guards or to the machinery when the guards are removed. A1

5.5 Electrical safety

5.5.1 General

A1 All electrical equipment shall conform to the requirements of EN 60204-1 in particular with regard to the protection against electrical shock (see EN 60204-1:2006, Clause 6).

At locations with spraying of water, the use of maximum 24 V in accordance with EN 60204-1:2006, 6.4, shall be considered for the control circuits. A1

5.5.2 Power circuits

Protection of electrical power circuits shall be to at least IP54 in all cases and to IP65 where there is a significant risk of exposure to fluids or dust (see EN 60529).

5.6 Emergency stop

A1 Drilling machines shall be equipped at the operator's start/stop station with easily and quickly accessible actuators of emergency-stop equipment in accordance with EN ISO 13850. The stop function shall be in accordance with EN 60204-1:2006, 9.2.2, category 0 or 1. The related part of the control system shall present a performance level of at least c in accordance with EN ISO 13849-1:2008. A1

All machine parts shall remain in the position on which they were stopped.

5.7 General safeguarding principles

5.7.1 The machine shall be designed so that it is not possible for the operator or other persons to trap a finger or hand in the clamp (see 5.7.4.1, 5.7.5 and 5.7.6).

5.7.2 All rotating parts of machinery including spindles, chucks, drills and any other tools shall be fully enclosed throughout the drilling cycle, so as to prevent contact with the body or clothing of any person (see 5.7.5 and 5.7.6).

Using manual machines, the drill shall be covered by fixed guards as far as practicable.