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Machines and plants for the manufacture, treatment and processing of hollow glass - Safety requirements - Part 1: Gob feeder

Maschinen und Anlagen für die Herstellung, Be- und Verarbeitung von Hohlglas - Sicherheitsanforderungen - Teil 1: Tropfenspeiser

Machines et installations pour la production, le façonnage et la transformation du verre creux - Exigences de sécurité - Partie 1: Mécanisme d'alimentation en paraisons

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ICS:

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English Version

**Machines and plants for the manufacture, treatment and
processing of hollow glass - Safety requirements - Part 1: Gob
feeder**

Machines et installations pour la production, le façonnage
et la transformation du verre creux - Exigences de sécurité
- Partie 1: Mécanisme d'alimentation en paraisons

Maschinen und Anlagen für die Herstellung, Be- und
Verarbeitung von Hohlglas - Sicherheitsanforderungen -
Teil 1: Tropfenspeiser

This European Standard was approved by CEN on 15 December 2006 and includes Amendment 1 approved by CEN on 10 October 2009.

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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 13042-1:2007+A1:2009) 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of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.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 2009-10-10.

This document supersedes EN 13042-1:2007.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

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).

$\boxed{A_1}$ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. $\boxed{A_1}$

This document is one of a series concerning machinery for the manufacture, treatment and processing of hollow 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, 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 13042-1:2007+A1:2009 (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 compiling this European Standard, it was assumed that the existing ad-hoc standards for components are applied.

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 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 applies to the design and installation of gob feeders which provide hollow glass forming machines with gobs.

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1.2 This European Standard deals with the significant hazards, hazardous situations and events relevant to gob feeders, when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). Noise is not a significant hazard for this type of machine. This European Standard specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards during commissioning, operation and maintenance. **A1**

1.3 This European Standard does not deal with bowl firing.

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

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.

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

A1 *deleted text* **A1**

EN 894-3:2000, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*
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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 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 1037:1995, *Safety of machinery — Prevention of unexpected start-up*

A1 *deleted text* **A1**

A1 EN ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 11201:1995, *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)*

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)* **A1**

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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, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* Ⓐ)1

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

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**gob feeder**

machine fed by a continuous flow of molten glass through a spout bowl, a flow control, a shape control of the gob and a cutting device, as i.e. a rotating tube, a plunger mechanism with single or multiple plungers and a shearing device situated below the orifices.

NOTE All mechanisms that comprise the gob feeder maintain a synchronised timing relationship with any hollow-glass forming machine

3.2**start-up**

beginning of the working cycle of the whole feeder with shearing

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 gob feeders and which require action to eliminate or reduce the risk.

Before using this European Standard, it is important to carry out a general risk assessment of the machine in question.

Ⓐ) Table 1 — List of significant hazards

Clause	Hazards	Dangerous items	Preventive measures: see clause:
4.1	Mechanical hazards:		
4.1.1	Crushing	moving parts against other moving or stationary parts	5.6
4.1.2	Shearing	edge tools (shear blade)	5.7
4.1.3	Cutting or severing	broken glass	7.2.4
4.1.4	Entanglement	chain and sprocket and belt and pulley drives of various feeder components	5.6
4.1.5	Drawing-in or trapping	shear mechanism, plunger mechanism	5.6

Table 1 (concluded)

Clause	Hazards	Dangerous items	Preventive measures: see clause:
4.1.6	Impact	shear mechanism, plunger mechanism	5.6
4.1.7	Stabbing or puncture	strands of glass	7.2.4
4.1.8	High pressure fluid ejection	all mechanisms that use forced lubrication systems or hydraulically operated mechanism with pressure above 50 bar	5.8; 5.10; 7.2.8
4.2	Electrical	direct or indirect contact	5.9; 5.10; 7.2.8
4.3	Thermal resulting in:		
4.3.1	Burns	hot glass, hot machine parts	5.11 to 5.16; 7.2.3; 7.2.4
4.3.2	Damage to health	feeder area in general	5.12; 5.13; 7.2.3; 7.2.4
4.4	Generated by materials and substances processed or used by the machinery:		
4.4.1	Fire or explosion	flammable fluids	5.8
4.5	Generated by neglecting ergonomic principles in machinery design, e.g. hazards from:		
4.5.1	Unhealthy postures or excessive efforts	exchange of expendables	5.12; 5.13, 7.2.2
4.5.2	Neglected use of personal protection equipment)	all feeder area, hot glass and exchangeables	7.2.4
4.5.3	Human error, human behaviour	adjustment of feeder mechanisms by unqualified personnel	7.2.3
4.5.4	Inadequate design of manual controls	manual controls (actuators)	5.5
4.6	Unexpected start-up, unexpected overrun from:		
4.6.1	Failure/disorder of the control system	all motion control	5.2.2; 5.3; 5.7; 5.10; 5.11; 7.2.7; 7.2.8
4.6.2	Human errors	all dangerous movements	5.2.2; 5.7; 5.10; 7.2.7, 7.2.8
4.7	Impossibility of stopping the machine in the best possible conditions	all moving mechanisms, glass flow, gob loading	5.2.1; 5.3; 5.10; 5.11; 5.15
4.8	Loss of stability	whole mechanism or part during installation	7.2.2; 7.2.4
4.9	Slip, trip and fall	oil, steps, platforms	5.4; 7.2.6

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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 this European Standard (e.g. sharp edges).

A1 For applications of a B-level standard such as EN 953, EN 982, EN 983, EN 1037, EN 60204-1 and EN ISO 13850, the manufacturer shall carry out an adequate risk assessment for the requirements thereof where choice is necessary. This specific risk assessment is part of the general risk assessment relating to the hazards not covered by this European Standard. **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, including training, and to any limiting value of the requirement and if appropriate to the means of verification.

5.2 Starting and stopping and unexpected start-up

5.2.1 Starting and stopping equipment

Starting and stopping equipment shall be fitted for the gob feeder itself and for each individual machine function in the sense of the mechanisms listed in 3.1. All manual controls including those provided for adjustments with the running machine shall be arranged in such a way that the operator has a good view of the machine and is outside the danger zone (remote start) when using them.

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5.2.2 Prevention of an unexpected start-up

A1 The gob feeder shall be fitted with a device which maintains a stop command in accordance with EN 1037:1995, 6.3.2, until the device is reset manually (e. g. by a latching-in stop control device). The related part of the control system shall present at least a performance level c in accordance with EN ISO 13849-1:2008 (see also 7.2.7).

NOTE See also 5.10. **A1**

5.3 Emergency-stop equipment

A1 Gob feeders shall have emergency-stop equipment in accordance with EN ISO 13850. Easily and quickly accessible emergency-stop devices shall be installed as a minimum at manual control stations and at locations reachable from inside all danger zones. The emergency-stop equipment shall stop all movements with exception of the removal of the shears out of the glass flow to prevent uncontrolled deviation of the flow of glass. The stop function shall be in accordance with EN 60204-1:2006, 9.2.2, category 0 or 1. The movement of the rotating tube may be excepted from stopping if a dedicated emergency stop can be triggered by an emergency-stop equipment, with a control device close to the drive of the tube. Provisions shall be made for the connection of the emergency-stop control from the receiving glass-forming machine (see 7.2.5).

NOTE Glass flow see 5.14. **A1**

5.4 Avoiding slip hazard

Lubricants and oils shall be restricted from causing slip hazards, e.g. by using of covers avoiding spraying of oil to the floor or platforms.

5.5 Design of manual controls

The manual controls (actuators) of the gob feeder shall be designed so that they can be operated without hindrance (constraint) when the operator is wearing personal protective equipment, e.g. heat-resistant gloves (see 5.3.5 of EN 894-3:2000).

5.6 Guards

[A1] Hazardous transmissions parts and other moving parts with the exception of the shears shall be safeguarded in accordance with EN 953 and EN 294:1992, Table 4, preferably with fixed guards (see EN 953:1997, 3.2). If moveable guards are used, the part of the control system related to the interlocking of these guards shall present a performance level of at least c in accordance with EN ISO 13849-1:2008.

If fixed guards are used, their fixing systems shall remain attached to the guards or to the machinery when the guards are removed. **[A1]**

5.7 Lockout of shears

The closing movement of the shears shall be able to be prevented by a mechanical restraint device (see 3.26.7 of EN ISO 12100-1:2003) or by the possibility to cut off the driving energy directly at the shears (see 7.2.7).

5.8 Hydraulic/pneumatic system

The hydraulic/pneumatic system shall be designed according to EN 982 and EN 983. Ducts with high pressure (above 50 bar), hoses and separable joints with hydraulic liquid and lubricants shall be covered preventing liquid from spreading to workplaces. The dangerous inflammation shall be avoided by the use of fire-resistant hydraulic fluids (see Annex A of EN 982:1996).

5.9 **[A1]** Electrical equipment

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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).

5.10 Energy supply disconnecting devices

Lockable energy supply disconnecting devices shall be provided, e.g. a master switch in accordance with EN 60204-1:2006, 5.3, an isolation valve and provisions for dissipation of pressure in accordance with EN 982:1996, 5.1.6, and EN 983 as relevant.

5.11 Gob-loading interruption

The shear mechanism shall be interlocked for the purpose of interrupting automatically the delivery of glass to the forming machine, e.g. by insertion of a chute under the shear, should there be any irregularity in the operation of the cutting action of the shear. The related part of the control system shall present a performance level of at least c in accordance with EN ISO 13849-1:2008.

Manual controls (actuators) shall be provided to allow the delivery of glass to the forming machine to be interrupted. The related part of the control system shall present a performance level of at least c in accordance with EN ISO 13849-1:2008. The actuators shall be installed at the operator's station for the gob feeder, and provisions shall be made for the connection of these actuators to the associated glass-forming machine such that they perform their intended function (see also 7.2.5).

NOTE 1 Glass flow see 5.14.

NOTE 2 Power failure see 5.15. **[A1]**