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Foundry machinery - Safety requirements for pressure metal diecasting units

Gießereimaschinen - Sicherheitsanforderungen an Metall-Druckgießanlagen

Machines de fonderie - Prescriptions de sécurité pour les unités à mouler les métaux sous haute pression

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This draft amendment is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 202.

This draft amendment A1, if approved, will modify the European Standard EN 869:2006. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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Foreword

This document (EN 869:2006/prA1:2008) has been prepared by Technical Committee CEN/TC 202 "Foundry Machinery", the secretariat of which is held by DIN.

This document is currently submitted to the Unique Acceptance Procedure.

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).

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

The new safety requirements as stated in this document comply with the additional relevant Essential Requirements of the new Machinery Directive 2006/42/EC complementing the existing Machinery Directive 98/37/EC.

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EN 869:2006/prA1:2008 (E)**1 Modification to "Foreword"**

Replace the 5th paragraph with the following:

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

2 Modification to "Introduction"

Add two new paragraphs at the end of the Introduction:

"Where for clarity an example of a preventative measure is given in the text, this should not be considered as the only possible solution. Other solutions can be used as far as they fulfil correctly the criteria expressed in the requirement.

This European Standard assumes, that the equipment is operated and maintained by trained personnel."

3 Modification to Clause "2 Normative references"

Replace EN 954-1 with:

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

Replace EN 418 with:

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

Replace EN 294 with:

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

Replace "EN 60204-1:1997, *Safety of ...*" with:

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

Replace the dated IEC reference of EN 61310-1 with "(IEC 61310-1:2007)".

Replace the dated IEC reference of EN 61310-2 with "(IEC 61310-2:2007)".

Add the following new standards:

"EN 842, *Safety of machinery — Visual danger signals — General requirements, design and testing*",

"EN 981, *Safety of machinery — System of auditory and visual danger and information signals*".

"EN ISO 7731, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)*",

"EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*" and

"ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*".

4 Modification to the whole document due to new/updated standards

Replace "EN 294" or "EN 294:1992" with "EN ISO 13857" or "EN ISO 13857:2008".

Replace "EN 418" with "EN ISO 13850".

Replace "EN 954-1" or "EN 954-1:1996" with "EN ISO 13849-1" or "EN ISO 13849-1:2008".

Replace "EN 563" with "EN ISO 13732-1".

5 Modification to "4.4 Thermal hazards"

Replace the 1st line with the following:

"Thermal hazards which can occur at diecasting machines by:".

6 Modification to "5.2 Mechanical"

6.1 Modification to "5.2.1 General"

Add as new 2nd paragraph the following requirement:

"Fixing systems of fixed guards shall remain attached to the guards or to the machine when the guards are removed.".

Replace the last sentence of the last paragraph of 5.2.1 with the following:

"The part of the control system related to the trip device shall comply with at least performance level PL=c with use of category 1 as defined in EN ISO 13849-1:2008.".

6.2 Modification to 5.2.2.1

Replace the 2nd paragraph of 5.2.2.1 b) with:

"The supplementary protective device, which protects persons getting behind the guard, can for example be a type 4 electro-sensitive protective device according to EN 61496-1 or an electromechanical or hydraulic-mechanical trip device with self-monitoring, in which case the related part of the control system shall comply with performance level PL=e with use of category 4 according to EN ISO 13849-1:2008.".

6.3 Modification to 5.2.2.2

Replace in 5.2.2.2 b) and e) "EN 60204-1:1997" with:

"EN 60204-1:2006".

Replace the 2nd last paragraph of 5.2.2.2 with:

"Related parts of the control system shall be in accordance with performance level PL=e with use of category 4 according to EN ISO 13849-1:2008.".

EN 869:2006/prA1:2008 (E)**6.4 Modification to "5.2.3 Guards for the die closing mechanism area"**

Replace 5.2.3 a) with: "

- a) be interlocked with the power supply for the dangerous movements (e.g. switch off the hydraulic pump and release the pressure of the accumulators). The relevant part of the control system shall have at least a performance level PL=c with use of category 1 according to EN ISO 13849-1:2008. Restarting the machine shall only be possible if the guard for the closing mechanism area is closed;"

Replace 5.2.3 b) with: "

- b) be interlocked with the control system. Opening of the guards shall stop all dangerous movements. The relevant part of the control system shall have at least a performance level PL=d with use of category 3 according to EN ISO 13849-1:2008. Restarting the dangerous movement shall only be possible if the guard for the closing mechanism area is closed. Movements of the ejector system with guard open are allowed, if,
- 1) for machines with a clear vertical distance between the tie bars up to 1 200 mm, the dangerous movements are restricted as stated in 5.9.2;
 - 2) for machines with a clear vertical distance between the tie bars greater than 1 200 mm, the conditions of 1) shall be fulfilled and additionally the speed of the ejector shall be reduced to 30 mm/s. The parts of the control system related to the speed reduction shall be at least performance level PL=b with use of category B according to EN ISO 13849-1:2008."

6.5 Modification to 5.2.4.4

Replace the 1st lines of the 1st paragraph of 5.2.4.4 with:

"5.2.4.4 Deviations from the requirements of 5.2.4.2 and 5.2.4.3 are allowed and the ejectors and core pullers may be operated with guards for the die area open provided that:"

7 Modification to "5.3 Electric equipment and control systems"**7.1 Modification to 5.3.2**

Replace the paragraph of 5.3.2 with:

"Unless otherwise stated in this document, the performance level PL with use of category of the parts of the control system operating safety functions shall be determined by the manufacturer on the basis of his risk assessment according to EN ISO 13849-1. The performance level shall be at least PL=c with use of category 1 according to EN ISO 13849-1:2008. See examples in Figures A.10 to A.15."

7.2 Modification to 5.3.3

Replace the paragraph of 5.3.3 with:

"The emergency stop function shall conform to stop category 0 or 1 according to EN ISO 13850:2006 and shall be in conformity with 9.2.5.4 of EN 60204-1:2006 and EN ISO 13850."

7.3 Modification to 5.3.4

Replace the paragraph with:

"The parts of the control system of diecasting machines related to dangerous movements of the die, shall be designed according to 5.3.5 or according to performance level PL=e with use of category 4 according to EN ISO 13849-1:2008."

7.4 Modification to 5.3.5.1 d)

Replace d) with: "

- d) signal of the normal interlocking according to performance level PL=e with use of category 4 according to EN ISO 13849-1:2008 (see Figures A.14 and A.15)."

8 Modification to "5.8 Ergonomic aspects"

Replace the 1st three paragraphs with:

"The machine shall be designed taking into account 4.8 of EN ISO 12100-2:2003, the guidelines of EN 13861 as well as the ergonomic principles in accordance with EN 614-1.

The manual controls of a semi-automatic operating diecasting machine shall be designed under ergonomic principles, if applicable, according to EN 894-1, EN 894-2 and EN 894-3.

The diecasting machine shall be designed so that setting-up and maintenance can be carried out in good working postures, if applicable, according to EN 1005-1, EN 1005-2 and EN 1005-3."

9 Modification to Clause "7 Information for use"

9.1 Modification to 7.2

Replace 7.2 (including headline) with: "

7.2 Warning devices and safety signs

Where hazards can not be sufficiently reduced by design or safeguarding, the manufacturer shall provide warning devices and/or safety signs warning for the residual hazards of the machine.

Warning devices and safety signs according to EN 61310-1 and EN 61310-2 shall be used.

Graphical symbols shall be in accordance with ISO 3864-1 and/or ISO 7000.

Danger signals shall be in accordance with EN ISO 7731 and/or EN 842 and/or EN 981.

Warning signs shall be affixed so that they are visible from outside the danger zone.

The manufacturer shall not rely upon warning devices and safety signs alone to reduce hazards in case of significant risks."