Kummi- ja plastitöötlusmasinad. Ekstruuderid ja ekstrusioonniliinid. Osa 1: Ekstruuderite ohutusnõuded

Plastics and rubber machines - Extruders and extrusion lines - Part 1: Safety requirements for extruders

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1114-1:2011 sisaldab Euroopa standardi EN 1114-1:2011 ingliskeelset teksti.	This Estonian standard EVS-EN 1114-1:2011 consists of the English text of the European standard EN 1114-1:2011.
Standard on kinnitatud Eesti Standardikeskuse 31.10.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.10.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
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Inglisekeelsed võtmesõnad: accident prevention, dangerous machines, extruding equipment, hazardous areas, hazards, information, plastic-working machines, rubber-working machines, safety measures, safety of machinery, utilization,

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Plastics and rubber machines - Extruders and extrusion lines - Part 1: Safety requirements for extruders

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Kunststoff- und Gummimaschinen - Extruder und Extrusionsanlagen - Teil 1: Sicherheitsanforderungen für Extruder

This European Standard was approved by CEN on 17 September 2011.

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Foreword

This document (EN 1114-1:2011) has been prepared by Technical Committee CEN/TC 145 “Plastics and rubber machines”, the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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 supersedes EN 1114-1:1996.

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 the relationship with EU Directives, see informative Annex ZA, which is an integral part of this document.

This is the first in a series of standards on the safety of extruders and extrusion lines.

Part 2 deals with die face pelletisers.

Part 3 deals with haul-offs.

NOTE Part 2 (EN 1114-2) was cancelled in 2010.

List of significant technical changes since the last edition:

— partially modified requirements and/or protective measures of extruders, feeding systems and ancillary equipment by taking into account the technological changes in the plastics and rubber industry and the development of the safety technology;

— modified requirements for the safety related parts of the machine control of extruders, feeding systems and ancillary equipment;

— the requirements and/or protective measures concerning the electrical equipment are specified in greater detail;

— addition of a noise test code.

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 the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100. The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

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.

1 Scope

This European Standard specifies all significant hazards, hazardous situations and events relevant to all types of screw extruders for plastics and rubber, when they are used as intended and under conditions of misuse which are foreseeable by the manufacturer (see Clause 4).

This European Standard additionally covers the following feeding systems:

— hoppers;

— single roller feed;

— double roller feed;

— crammer feeder;

and the following ancillary equipment which form part of or are attached to the extruder:

— screen changers;

— melt/gear pumps;

— melt pipes and adaptors;

— static mixers;

— extruder head that give initial shape to the extruded material.

NOTE Metering devices are not covered by this standard.

This European Standard does not deal with hazards caused by the processing of materials and which may lead to a risk of fire or release of health hazardous materials.

An extruder conforming to this document is not regarded as a pressure vessel as defined in the Pressure Equipment Directive 97/23/EC.

Extruders usually do not produce explosive atmospheres. Where materials are processed, which may cause an explosive atmosphere, the Directive 94/9/EC on the Equipment intended for use in Potentially Explosive Atmospheres (ATEX) should be applied. Explosion hazards are not dealt with in this document.

This European Standard is not applicable to extruders which are manufactured before the date of its publication as EN.

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 349:1993+A1:2008, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 574:1996+A1:2008, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 953:1997+A1:2009, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 1037:1995+A1:2008, *Safety of machinery — Prevention of unexpected start-up*

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

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:2010)*

EN ISO 3747:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment (ISO 3747:2010)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

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

EN ISO 9614-2:1996, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning (ISO 9614-2:1996)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

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

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1:2008, *Ergonomic of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

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)*

EN ISO 14122-1:2001, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels (ISO 14122-1:2001)*

EN ISO 14122-1:2001/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels — Amendment 1 (ISO 14122-1:2001/Amd 1:2010)*

EN ISO 14122-2:2001, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2001)*

EN ISO 14122-2:2001/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways — Amendment 1 (ISO 14122-2:2001/Amd 1:2010)*

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*

EN ISO 14122-3:2001/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails — Amendment 1 (ISO 14122-3:2001/Amd 1:2010)*

EN ISO 14122-4:2004+A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders (ISO 14122-4:2004+Amd 1:2010)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

3.1
extruder
machine which conveys materials by means of one or more screws rotating within a barrel and discharges it continuously through the extrusion head

NOTE In doing so, the material can be heated, cooled, consolidated, mixed, plasticised, can undergo chemical reactions, and may be degassed or gas injected. Viewed in the direction of flow of the material the extruder itself ends with the tip of the screw or screws.

3.2
feeding system
equipment which feeds the material into the extruder

3.3
hopper
container for gravity feeding of material into the extruder

3.4
single roller feed
roller used for feeding the extruder, which has an axis parallel to that of the screw

NOTE The screw and the roller counter-rotate and form an in-running nip and thereby improve the regularity of feeding. The device may be driven by the screw or by an independent device.

3.5
double roller feed
two rollers used for feeding the extruder

NOTE The feeding device consists of two rollers arranged in parallel positioned at the feed opening of the extruder.