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Črpalke za tekočine - Varnostne zahteve - Kmetijsko-živilska oprema - Pravila načrtovanja za zagotovljanje higiene pri uporabi

Liquid pumps - Safety requirements - Agrifoodstuffs equipment; Design rules to ensure hygiene in use

Flüssigkeitspumpen - Sicherheitsanforderungen - Nahrungsmittelausrüstungen; Konstruktionsgegeln zur Sicherstellung der Hygiene bei der Verwendung

Pompes pour liquides - Prescriptions de sécurité - Matériel agro-alimentaire; Règles de construction pour assurer l'hygiène à l'utilisation

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ICS:

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67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry

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English Version

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This European Standard was approved by CEN on 22 January 2012.

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Foreword

This document (EN 13951:2012) has been prepared by Technical Committee CEN/TC 197 “Pumps”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by October 2012, and conflicting national standards shall be withdrawn at the latest by October 2012.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 13951:2003+A1:2008.

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 Annex ZA, which is an integral part of this document.

The modifications brought to the previous version of EN 13951:2003 deal with normative reference updates, minor editorial changes, minor details add-on and the clause renumbering has been adapted accordingly.

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, Turkey 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.

In drafting this European Standard, it was assumed that pumps within the scope of this European Standard are in accordance with all relevant requirements of EN 809. EN 13951 provides additional hygiene related requirements to prevent the pump causing contamination of the pumped product when used in accordance with the instruction handbook.

It is the responsibility of the manufacturer to ensure that the pump is designed and manufactured such that it can be adequately cleaned. However, due to the influence of the product, the process and the cleaning regime adopted, it is only the end-user that can ultimately ensure hygienic conditions during operation.

1 Scope

This European Standard deals with the special technical safety requirements for liquid pumps and pump units operating with agrifood-stuff. This European Standard is intended to be used with EN 809 to give the additional requirements for hazards arising from the pumping of substances intended for human and domestic animal consumption (see Clause 4).

This European Standard also establishes requirements and/or measures for the reduction of risks during use, including misuse foreseeable by the manufacturer.

This European Standard is not intended to be used for pumps and pump units at any stage in the public water supply, nor for pumps handling pharmaceutical products, nor for any other application for which more appropriate standards exist.

The pumps and pump units covered by this European Standard are the following:

— rotodynamic pumps;

— rotary positive displacement pumps;

— reciprocating positive displacement pumps.

Pumps dealing with agrifood-stuff which are not indicated in this scope are potentially covered by EN 1672-2:2005+A1:2009.

This document is not applicable to liquid pumps for agrifoodstuff applications which are manufactured before the date of its publication as an EN.

2 Normative references

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

EN 809, *Pumps and pump units for liquids — Common safety requirements*

EN ISO 4287, *Geometrical product specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

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

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
food/agrifood-stuff products
product, ingredient or material intended to be orally consumed at any stage of its production process

3.2
food hygiene
taking of all measures during the preparation and processing of food to ensure that it is fit for human or animal consumption

[SOURCE: EN 1672-2:2005+A1:2009]

3.3
adverse influence
reduction of the fitness for consumption of a food; a food can be adversely influenced in particular by microbial pathogens or other unwanted micro-organisms, toxins, vermin, domestic animals and other contaminants

3.4
areas of equipment

Note 1 to entry: These areas are not to be confused with any others amongst those defined in other standards (e.g. electro-technical standards).

3.4.1
food area
set of machinery surfaces which are exposed to the food and from which the food or other materials can drain, drip, diffuse or be drawn into (self returned) the food or food container

[SOURCE: EN 1672-2:2005+A1:2009]

3.4.2
non-food area
area other than those specified above

3.5
product/pumped product
products passing through the pumps as a result of process, testing, cleaning, rinsing, or disinfecting products

3.6
cleaning
set of operations which reduce the potential for contamination to an acceptable level

3.6.1
cleanable
design and construction which permits soils to be removed by appropriate cleaning methods

3.6.2
cleanability
ability of the pump to be cleaned by a defined procedure to defined conditions of cleanliness

3.6.2.1
cleaned in place or mechanical cleaning (CIP, NEP)
CIP or NEP means soil removal by impingement, circulation or flowing chemical detergent solutions and water rinses into and on to the surfaces to be cleaned without dismantling

Note 1 to entry: The term CIP corresponds to the abbreviation of the English wording "Cleaned In Place". In French, the term NEP is the abbreviation of the wording "Nettoyage En Place". In German, the term CIP is used.

3.6.2.2
cleaned out of place or manual cleaning (COP, NHP)
COP or NHP means soil removal when the equipment is partially or totally dismantled

Note 1 to entry: The term COP corresponds to the abbreviation of the English wording "Cleaned Out of Place". In French, the term NHP is the abbreviation of the wording "Nettoyage Hors Place". In German, it is the term COP which is used.

3.7
contamination
presence of soils

[SOURCE: EN 1672-2:2005+A1:2009]

3.8
corrosion resistant material
material resistant to normally occurring action of chemical or electrochemical nature at all stages of food processing, cleaning and disinfection according to the instructions for use

3.9
crevice
surface defect e.g. crack, fissure, which has an adverse influence on cleanability

3.10
dead space
space wherein a pumped product, or soils may be retained or not completely removed during the cleaning operation

3.11
disinfection
process applied to a cleaned surface which is capable of reducing the numbers of viable micro-organisms, but not necessarily their spores, to a level considered safe for product production

3.12
sterilization
validated process used to reach a state free from viable micro-organisms including all relevant bacterial spores

Note 1 to entry: In a sterilization process, the nature of microbial death or reduction is described by an exponential function. Therefore, the number of micro-organisms that survive a sterilization process can be expressed in terms of probability. While the probability can be reduced to a very low number, it can never be reduced to zero.

3.13
durable
ability of a surface to withstand the intended conditions of use, for example: to resist damage caused by the action of the process, contact with the pumped product including thermal actions

3.14
joint
junction of two or more pieces of material

[SOURCE: EN 1672-2:2005+A1:2009]

3.15
non absorbent material
material which, under intended conditions of use, does not retain substances with which it comes into contact so that it has no adverse influence on pumped products

3.16
non toxic material
material which does not produce or release substances injurious to health under intended conditions of use

[SOURCE: EN 1672-2:2005+A1:2009]

3.17
seal
component to prevent the unwanted entry or passage of any matter

3.18
self draining
design and construction of the shape and surface finish so as to ensure the evacuation by gravity of the pumped products

3.19
smooth
condition of a surface (with reference to surface finish) which satisfies operational and hygienic requirements

3.20
soil
any unwanted matter, including product residues, micro-organisms, residual detergent or disinfecting agents

[SOURCE: EN 1672-2:2005+A1:2009]

3.21
vermin
animals (including mammals, birds, reptiles and insects) which may adversely influence the pumped products

3.22
toxic/toxicity
toxicity of a material is defined by EU or local regulations.

Note 1 to entry: Toxicity depends on the quantity of material which can migrate either by wear or by diffusion in the pumped product under intended use.

3.23
compatibility (material)
compatibility means that the material is non absorbent and insoluble, and that the material surfaces do not deteriorate due to chemical, microbiological, mechanical or thermal action, as a result of contact with the pumped product

3.24
compatible (liquid)
compatible means that the liquid identified does not create toxic conditions or any other adverse influence when mixed with the pumped product

3.25
method of assembly
steps to assemble components or parts when they are in a dismantled state

3.26
auxiliary liquid
auxiliary liquid is a liquid provided for flush, pressure balance, or other similar purposes

3.27
barrier liquid
barrier liquid is an appropriate (that is clean, compatible, etc.) liquid inserted between two seals or barriers

4 List of hazards

The potential hazards which can be associated with pumps and pump units used for pumping agrifoodstuffs products can arise from:

— micro-biological causes such as pathogens, spoilage, micro-organisms or toxins resulting from their ingress to or retention by the product;

— chemical causes resulting from contamination such as lubricating, cleaning, or disinfection substances;

— foreign materials entering the product such as unwanted allergies, pests, metals, wear debris, etc., resulting from raw materials or other materials used in the construction of the equipment, or entry through unprotected openings;

— mechanical causes such as possible mis-assembly or mis-use resulting in opportunities for micro-biological, chemical or foreign material hazards;

— any deterioration resulting from thermal, chemical, or vibration effects on the pump or plant.

The micro-biological hazards which may arise in a pump or pump unit reflect the particular characteristics of the installation in which it is installed such as whether the pumped product can develop micro-organisms, or whether these are reduced to non-hazardous levels by subsequent stages of the process, or the operating pattern involving a change in the product being pumped.

For these reasons it is only possible to fully assess the hazards only by considering the whole production line. It is the responsibility of the user to consider the hazards and to carry out any tests deemed to be necessary to demonstrate the reduction of risks.

The manufacturer of the pump or pump unit assists in the reduction of risks by designing the pump or pump unit to avoid undesirable features known to create risks to hygiene, and to accommodate effective cleaning. The reduction of other non-biological hazards should also be considered during the design of the pump or pump unit.

The hazards can be generated at any time during the stages of installation, commissioning, adjustment, operation, maintenance, or disposal, from the normal usage or from foreseeable misuse of the pump or pump unit. The risks of hazards shall be assessed using the procedure described in EN ISO 12100 (see Figure 1) and steps taken to reduce the risks to an acceptable level using the safety requirements or methods, and means of verification given in this European Standard and indicated also in Table 1.

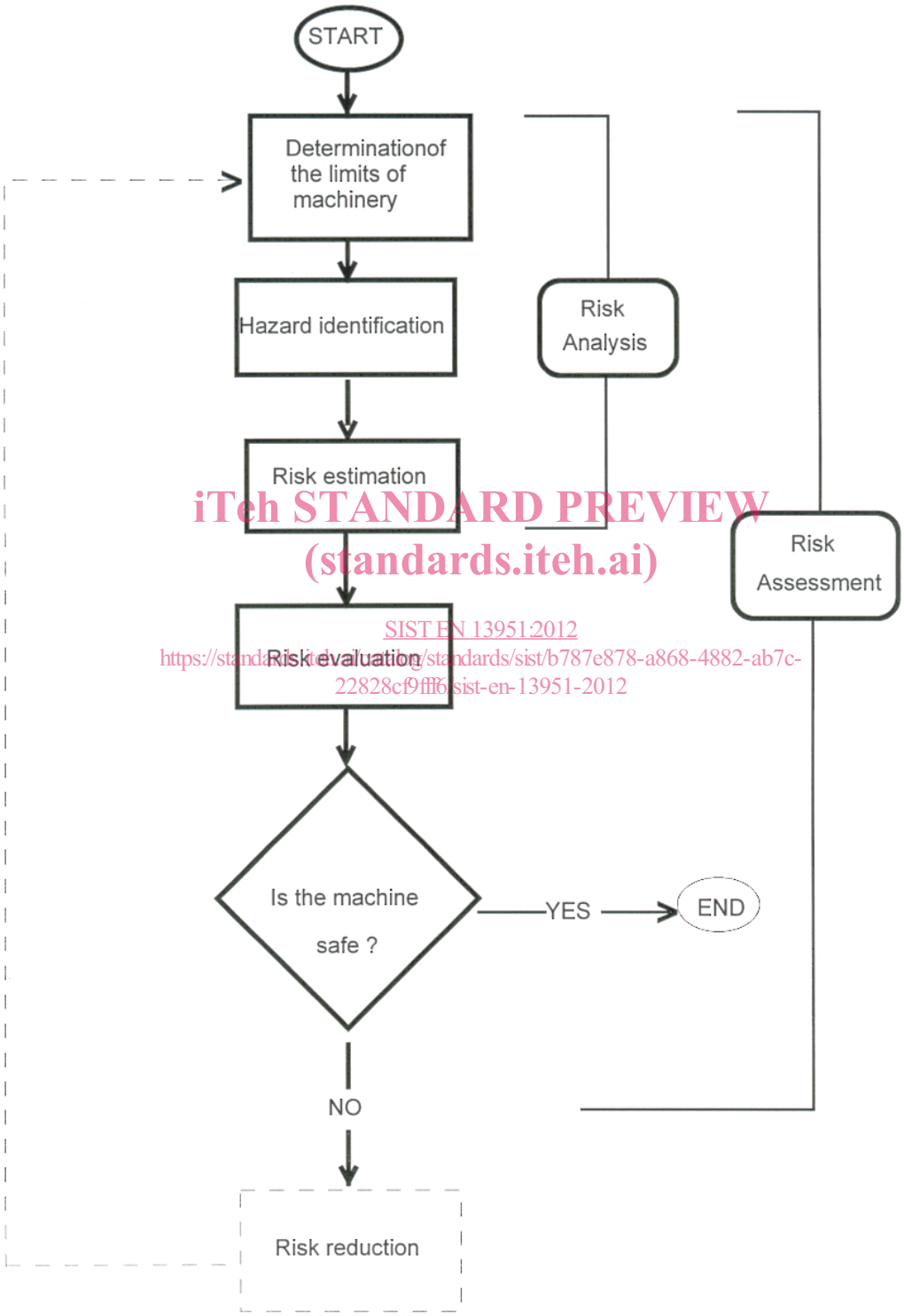

Figure 1 — The iterative process to achieve safety