Masinad tööstuslike detailide pindade puhastamiseks ja eeltöötlemiseks vedelike või aurude abil. Osa 2: Veepõhiseid puhastusvedelikke kasutatavate masinate ohutus KONSOLIDEERITUD TEKST

Machines for surface cleaning and pre-treatment of industrial items using liquids or vapours - Part 2: Safety of machines using water based cleaning liquids CONSOLIDATED TEXT

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12921-2:2005+A1:2009 sisaldab Euroopa standardi EN 12921-2:2005+A1:2008 ingliskeelset teksti.	This Estonian standard EVS-EN 12921-2:2005+A1:2009 consists of the English text of the European standard EN 12921-2:2005+A1:2008.
Standard on kinnitatud Eesti Standardikeskuse 29.01.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 29.01.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 26.11.2008.	Date of Availability of the European standard text 26.11.2008.
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English Version

Machines for surface cleaning and pre-treatment of industrial items using liquids or vapours - Part 2: Safety of machines using water based cleaning liquids

Machines de nettoyage et de pré-traitement de pièces industrielles utilisant des liquides ou des vapeurs - Partie 2: Sécurité des machines utilisant des liquides de nettoyage à base aqueuse

Maschinen zur Oberflächenreinigung und -vorbehandlung von industriellen Produkten mittels Flüssigkeiten oder Dampffasen - Teil 2: Anlagen, in denen wässrige Reinigungsmittel verwendet werden

This European Standard was approved by CEN on 25 March 2008 and includes Amendment 1 approved by CEN on 23 October 2008.

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.

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Foreword

This document (EN 12921-2:2005+A1:2008) has been prepared by Technical Committee CEN /TC 271, "Surface treatment equipment — 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 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-10-23.

This document supersedes EN 12921-2:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨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 EC Directive(s).

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

This standard is part of a series of standards in the area of safety for development and construction of machines for surface cleaning and pre-treatment of industrial items using liquids or vapours.

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.

Introduction

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

This European Standard contains additional safety requirements to and/or deviations from EN 12921-1.

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

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.

The EN 12921 series includes the following parts:

— Part 1: Common safety requirements

— Part 2: Safety of machines using water based cleaning liquids

— Part 3: Safety of machines using flammable cleaning liquids

— Part 4: Safety of machines using halogenated solvents.

1 Scope

This European Standard deals only with the significant hazards of machines for surface cleaning and pre-treatment (in the following called "cleaning machines") of industrial items using water based cleaning liquids in the mode of suspension, solution or dispersion of compounds or substances in water applied by immersion and/or spraying in one or more stages.

This European Standard ⟦A1⟧ applies ⟨A1⟩ in combination with EN 12921-1. Both parts together cover all significant hazards relevant for cleaning machines for industrial items using liquids or vapours, when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). The specific requirements specified in this standard take precedence over the respective requirements in EN 12921-1. This standard should be applied together with EN 12921-3 in case of release of flammable vapours from water based cleaning liquids.

This European Standard ⟦A1⟧ applies ⟨A1⟩ together with EN 12921-3 and prEN 12921-4 in case of use of water based cleaning liquids of which evaporating can lead to hazards caused by explosive atmospheres. Water based cleaning liquids containing a quantity of halogenated solvents exceeding 2 % of the volume are considered hazardous with respect to the creation of a potentially explosive atmosphere.

This European Standard does not apply to machinery and related equipment excluded from the scope of EN 12921-1.

This European Standard does not apply to cleaning machines for industrial items using water based cleaning liquids which are manufactured before the publication of this 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 746-1, *Industrial thermoprocessing equipment — Part 1: Common safety requirements for industrial thermoprocessing equipment*

EN 746-2, *Industrial thermoprocessing equipment — Part 2: Safety requirements for combustion and fuel handling systems*

EN 1127-1, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 1717, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN 12921-1:2004, *Machines for surface cleaning and pre-treatment of industrial items using liquids or vapours — Part 1: common safety requirements*

EN 12921-3:2004, *Machines for surface cleaning and pre-treatment of industrial items using liquids or vapours — Part 3: safety of machines using flammable cleaning liquids*

EN 60204-1:1997, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:1997)*

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

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

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003, EN 12921-1:2004 and the following apply.

3.1
alkaline
any water based solution having a pH value above 7,5

3.2
dispersion
water based mixture containing a liquid or solid which is not dissolved

3.3
strong alkaline solution
water based solution having a pH value above 12

3.4
strong acidic solution
water based solution having pH value below 4

3.5
suspension
water based mixture containing solid particles in stable or unstable form

3.6
emulsion
class of colloidal dispersions containing two or more immiscible liquids such as oil in water

NOTE Emulsions can be stable or unstable.

3.7
stable emulsion
emulsion containing an emulsifying agent to prevent the separation of its components

3.8
unstable emulsion
emulsion which will separate into its components

3.9
neutral solution
any water based solution having a pH value between 6.5 and 7.5

4 List of significant hazards

Table 1 — List of significant hazards associated with machines for surface cleaning and pre-treatment using water based cleaning liquids

Clause/sub-clause of this standard	Hazard	Clause/sub-clause of EN 12921-1:2004
4.1	**General** This clause contains significant hazards, hazardous situations and events, as far as they are dealt with in this standard, identified by risk assessment as significant for this type of machinery using water-based cleaning liquids and which require action to eliminate or reduce the risk.	4.1
4.2	**Mechanical hazards**	4.2
4.2.1	**Crushing, shearing, cutting, entanglement, drawing-in, impact**	4.2.1
4.2.2	**High pressure fluid ejection**	4.2.2
4.2.3	**Ejection of parts of the cleaning machine and/or items**	4.2.3
4.2.4	**Loss of stability (of cleaning machine and cleaning machine parts)**	4.2.4
4.2.5	**Personnel's slip, trip and fall hazards**	4.2.5
4.3.	**Electrical hazards** These hazards can be increased by the presence of vapour, moisture, mist and/or liquid water. Areas from which vapours or liquid can escape are e.g.: — internal chambers of cleaning machines, including dead zones; — tanks and spaces over liquid surfaces; — exhaust and ducts chambers and enclosures; — areas surrounding doors, covers and lids; — areas where parts can transit during load/unload operation.	4.3
4.4	**Thermal hazards**	4.4
4.5	**Hazards generated by noise**	4.5
4.6	**Hazards generated by materials and substances processed, used or emitted by the cleaning machine**	4.6
4.6.1	**General**	4.6.1
	NOTE Information on the method of risk analysis is given in EN 1050.	

Table 1 *(continued)*

Clause/sub-clause of this standard	Hazard	Clause/sub-clause of EN 12921-1:2004
4.6.2	**Hazards resulting from contact with/or inhalation of dangerous liquids, gases, aerosol, fumes and dusts** An assessment shall be carried out considering the characteristics of the water based cleaning liquid for which the cleaning machine is designed, the material(s) to be processed, the properties of the contaminants to be removed and their interaction with the characteristics of the cleaning machine. The level of risk depends on the dangerous properties of the substances used or processed, their compatibility with the characteristics and material of construction of the cleaning machine, the likelihood that exposure will occur and the degree of exposure. The hazards generated by contact with/or inhalation of dangerous fluids, gases, mists, fumes and dust can be caused by e.g.: — contact with irritant of corrosive chemicals (e.g. by pickling, passivating); — inhalation of vapours, powder or mist (e.g. during preparation of solutions for chromating and phosphating); — backflow of water based cleaning liquid into the public water supply. The above mentioned hazards can occur in the following situations and can be caused by: — handling of the cleaning products (due to the necessity of mixing and/or the reaction with water) during the filling and refilling of the cleaning machine; — normal operation; — chemical reaction caused by the contaminant(s) during the cleaning process; — chemical reaction caused by mixing not compatible products; — modification of the chemical characteristics of the water based cleaning liquid which may occur during the process; — cleaning machine failure or breakdown due to the not compatibility of material of construction with the water based cleaning liquid or the chemical reactions generated during the cleaning process; — maintenance.	4.6.2
4.6.3	**Fire and explosion hazard** See 4.6.3.1 and 4.6.3.2 of EN 12921-1:2004. These hazards may be caused by: — the forming of hydrogen caused by chemical reaction of acid or alkaline cleaning liquid with metal (e.g. particularly with aluminium, magnesium or other alloys), in particular fines, small chips and swarf, and/or contaminants; — the water based liquid to be used in the cleaning machine (e.g. emulsion); — change in composition of the water based liquid due to drag out or flammable residues being removed from items being cleaned; — deflagration in oil or gas direct fired heating system.	4.6.3
4.7	**Hazards combinations**	4.7
4.8	**Hazards caused by failure of energy supply**	4.8
4.9	**Hazards related to failure of control system**	4.9

5 Safety requirements and/or measures

5.1 General

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

In addition, the cleaning machine shall be designed according to the principles of EN ISO 12100-2 for relevant but not significant hazards which are not dealt with by this standard (e.g. sharp edges).

The common safety requirements or measures for cleaning machines using cleaning liquids or vapours in 5.1 of EN 12921-1:2004 shall also be considered.

The intended use shall be determined and explained/defined in the instruction handbook and, when necessary, by other additional means (plate, sign, labelling, etc.) in accordance with the properties of the water based cleaning liquids indicated in the safety data sheet.

5.2 Mechanical hazards

See 5.1 and 5.2 of EN 12921-1:2004.

5.2.1 Safeguarding of danger points

See 5.2.1 of EN 12921-1:2004.

5.2.1.1 Safety measures against crushing, shearing, cutting, entanglement, drawing-in, impact

See 5.2.1.2 of EN 12921-1:2004.

5.2.1.2 Guards and interlocks

See 5.2.1.3 of EN 12921-1:2004.

5.2.1.3 Moving parts of the cleaning machine

See 5.2.1.4 of EN 12921-1:2004.

5.2.1.4 Location of controls

See 5.2.1.5 of EN 12921-1:2004.

5.2.1.5 Prevention of unexpected close or fall of covers, lids and doors

See 5.2.1.6 of EN 12921-1:2004.

5.2.1.6 Devices for setting-up, make-ready, cleaning and trouble-shooting during the work process

See 5.2.1.7 of EN 12921-1:2004.

5.2.2 Safety measures against high pressure fluid ejection

See 5.2.2 of EN 12921-1:2004.

5.2.2.1 Safety measures against overpressure

See 5.2.2.2 of EN 12921-1:2004.

5.2.2.2 Safety measures against rupture and corrosion of piping or joints

See 5.2.2.3 of EN 12921-1:2004.

5.2.3 Safety measures against ejection of parts of the cleaning machine and/or items

See 5.2.3 of EN 12921-1:2004.

5.2.4 Safety measures against loss of stability (of cleaning machine and cleaning machine parts)

See 5.2.4 of EN 12921-1:2004.

5.2.4.1 Positioning of the cleaning machine

See 5.2.4.2 of EN 12921-1:2004.

5.2.4.2 Safety measures against overload

See 5.2.4.3 of EN 12921-1:2004.

5.2.4.3 Safety measures against overfilling

See 5.2.4.4 of EN 12921-1:2004.

5.2.5 Safety measures against personnel's slip, trip and fall

See 5.2.5 of EN 12921-1:2004.

5.3 Electrical requirements

See 5.3.1, 5.3.2 and 5.3.3 of EN 12921-1:2004.

The cleaning machine shall be constructed so that water based liquid, vapour, moisture, mist, dripping or condensation cannot meet live electrical parts directly or indirectly.

This can be achieved by applying either the following combined safeguarding measures:

— Placing the electrical equipment – where possible – in a dry environment,

in combination with

— use of electrical insulation material resistant to water and/or chemical compounds with which it may get in contact

and

— use of a control transformer for supplying the control circuits

and

— use of electrical equipment having a minimum protective degree of IP 55 according to EN 60529

or

— use of protective extra-low voltage (the nominal voltage shall not exceed 60 V DC or 25 V AC). See for additional requirements 6.4.1 of EN 60204-1:1997.

5.4 Safety requirements and measures against thermal hazards

See 5.4 of EN 12921-1:2004.

5.4.1 Heating systems

See 5.4.2 of EN 12921-1:2004.

5.4.2 Measures against contact of the skin with hot surfaces

See 5.4.3 of EN 12921-1:2004.

5.4.3 Measures against radiation

See 5.4.4 of EN 12921-1:2004.

5.4.4 Measures against overheating of cleaning liquid

See 5.4.5 of EN 12921-1:2004.

5.5 Safety requirements and measures against noise

See 5.5 of EN 12921-1:2004.

5.5.1 Noise reduction at source at the design stage

See 5.5.2 of EN 12921-1:2004.

5.5.2 Noise reduction by protective measures

See 5.5.3 of EN 12921-1:2004.

5.5.3 Noise reduction by information on personal protective equipment (PPE)

See 5.5.4 of EN 12921-1:2004.

5.6 Safety requirements and measures against hazards generated by materials and substances processed, used or emitted by the cleaning machine

See 5.6 of EN 12921-1:2004.

5.6.1 General

See 5.6.1 of EN 12921-1:2004.

5.6.2 Safety measures against contact with/or inhalation of dangerous liquids, gases, aerosol, fumes

See 5.6.2 of EN 12921-1:2004.

5.6.2.1 Handling of the water based cleaning products

Machines designed to be used with cleaning products subject to exothermic reaction with water, shall be equipped with a system to prevent the ejection of cleaning liquid caused by an exothermic reaction.

The system shall be designed to prevent the ejection of water based cleaning liquid during filling, refilling and normal operation.

When the use of different cleaning liquids can lead to hazardous situations, the machine shall be equipped with a monitoring system that detects the change of properties of the cleaning liquid and

— cuts off the power supply to the machine

or

— restores automatically the original properties of the cleaning liquid.

In particular, precautions shall be taken if a chemical in powder form (e.g. containing sodium hydroxide) is present into the cleaning machine.

The manufacturer shall inform the user about the choice and use of personal protective equipment as recommended in clause 7.

In presence of hazardous liquids, or not compatible liquids or liquids of different nature, their presence and nature shall be shown and identified by colours on the pipes and wherever necessary to prevent the relevant risks. Identified colours and other signs shall be shown in the instruction manual at least.

When hazardous products like strong alkaline solution or strong acidic solutions are used, unintended opening of the cleaning doors and drain-off valves shall be prevented. This may be ensured for doors e.g. by interlocks with guard locking and for drain-off valves e.g. operation by two dissimilar actions.

5.6.2.2 Emission generated by the cleaning process during normal operation

Cleaning machines releasing aerosols and/or vapours above the admissible exposure limit values shall be equipped with forced ventilation.

Forced ventilation not operating during the cleaning process but at the end of it, shall be constructed to avoid escape of vapours when the operator opens the door.

Closed machines shall be designed in such a way that all vapours and/or aerosols are extracted before opening the access door.

These requirements do not apply to closed cleaning machines (see 3.4 of EN 12921-1:2004) if the following conditions are fulfilled:

— total cabinet volume does not exceed 0,7 m^3;

— liquid reservoir is properly protected to reduce emission from liquid surface;

— process temperature does not exceed 65 °C;

— only the cleaning liquids with a pH-value between 6,5 and 12 are used.

Open top cleaning machines shall be equipped with forced ventilation or vapour condensation or combination of both in order to reduce emissions released from the liquid surface below the admissible exposure limit values.

These requirements do not apply to open top cleaning machines with

— total open surface not exceeding 0,7 m^2 ;

— operating temperature not exceeding 65 °C;

— cleaning liquid not exceeding pH 12.

The efficiency of the forced ventilation can be achieved by e.g.:

— width of the tank shall not exceed 50 cm in case of an exhaust system fitted on one side only or 120 cm in case of an exhaust system on two sides;

— for the flow rate shall be between 0,3 $m^3 s^{-1} m^{-2}$ and 0,6 $m^3 s^{-1} \cdot m^{-2}$ depending on the chemicals and their concentration in the water based cleaning liquid. The surface to be considered is the free surface of the water based cleaning liquid.

Multistage or multitank cleaning machines generating vapours shall be equipped with forced ventilation or other means according to 5.6.2 of EN 12921-1:2004.

Vapours of different nature not compatible each other shall be extracted by single separate ventilation and ducting.

Forced ventilation or vapour condensation shall be ensured at each stage generating vapours.

5.6.2.3 Maintenance

The cleaning machine shall be designed so that during maintenance hazards to personnel are prevented.

All internal parts of the machine shall have easy access for maintenance.

All the cleaning machines shall be equipped with a drain. Cleaning machines equipped with external pumps shall be equipped with a valve(s) to isolate the pump from strong acid or strong alkaline cleaning liquid. Unintended actuation of these valves shall be prevented by design.

Information on additionally required personal protective equipment shall be given in the instruction handbook (see 7.2.4).

5.6.2.4 Chemical reaction

Cleaning machines using water based cleaning liquids of different nature (e.g. multistage cleaning machines) shall be designed to avoid mixing of incompatible cleaning liquids.

Information concerning the risks arising from chemical reactions or from the use of incompatible cleaning liquids shall be given in the instruction handbook (see 7.2.1).

5.6.2.5 Connection to the public water supply

To prevent back-flow the connection of the cleaning machine to the public water supply shall comply with EN 1717 (see also 7.2.6).

5.6.3 Fire and explosion

See 5.6.3 of EN 12921-1:2004.

5.6.3.1 Chemical reaction

Cleaning machines using water based cleaning liquids that can generate a chemical reaction leading to potentially explosive atmosphere shall either comply with EN 12921-3 or be subjected to an explosion risk analysis (see EN 1127-1).

NOTE 1 Many metals are attacked by acid or alkaline water-based solutions, which leads to hydrogen formation. This happens

— especially when the plant is stopped and items or chips remain in the bath for a longer period,

— particularly fast with magnesium, aluminium and their alloys.

NOTE 2 An accumulation of dangerous explosive atmosphere inside the plant is e.g. prevented by means of

— use of cleaning plants with sufficient ventilation during the cleaning process,

— information in the instructions for use on cleaning intervals of the filter unit,

— additional measures for a longer standstill of the plant (through the night, weekend), e.g. cleaning and removal of metal residues (chips) and ventilation of the plant through an open cover.

5.6.3.2 Water based cleaning liquid to be used in the cleaning machine

Cleaning machines using emulsion as water based cleaning liquids shall be designed considering the type of emulsion used or generated by the cleaner (cleaning agents). For emulsions based on flammable hydrocarbons EN 12921-3 applies.

EN 12921-3 is not applicable when the cleaning machine is restricted to the use of:

— water based cleaning liquids in the form of stable emulsion, composed of:

  — A maximum of 5 % of emulsified flammable component, provided that the heating system can not generate a temperature which exceeds the limit temperature of the emulsified flammable liquid in the mixture as stated in EN 12921-3;

  — A maximum of 8 % emulsified flammable component, provided that no heating system is installed;

— water based cleaning liquids in the form of unstable emulsion, composed of:

  — A flammable liquid having a flash point greater than 55 °C and water content equal to or more than 50 % of the total liquid volume, provided the cleaning machine is not equipped with heating system or heating source (e.g. pump) which can rise the temperature of the liquid to the limit temperature, as stated in EN 12921-3.

5.6.3.3 Change in composition of the cleaning liquid

Cleaning machine where a flammable cleaning liquid can be transferred into the water based cleaning liquid (e.g. contaminants removed from items, liquid transferred from the previous stage in a multistage cleaning machine) and creating an explosive atmosphere shall comply with EN 12921-3.

5.6.3.4 Direct heating system

Burners of cleaning machines with oil or gas fired direct heating systems shall be equipped with a flame monitoring device according to EN 746-1 and EN 746-2.

5.7 Safety requirements and measures against hazard combinations

See 5.7 of EN 12921-1:2004.

5.7.1 Safety measures against rupture of pipe, joints or unexpected overpressure

See 5.7 of EN 12921-1:2004.

5.7.2 Safety measures against ejection of hot and/or wet items

See 5.7 of EN 12921-1:2004.

5.7.3 Safety measures against fall of items during the process with unexpected ejection of cleaning liquid (splashes)

See 5.7 of EN 12921-1:2004.

5.8 Safety requirements and measures against failure of energy supply

See 5.8 of EN 12921-1:2004.

5.8.1 Failure of forced ventilation

See 5.8.2 of EN 12921-1:2004.

5.8.2 Safety measures against unexpected ejection of cleaning machine part or cleaning liquid

See 5.8.3 of EN 12921-1:2004.

5.8.3 Safety measures against failure or malfunction of the control system

See 5.9 of EN 12921-1:2004.

5.8.4 Safety measures against items remaining in the cleaning machine

See 5.8.4 of EN 12921-1:2004.

5.9 Control systems

See 5.9 of EN 12921-1:2004.

6 Verification of the safety requirements and/or measures

6.1 General

See 6.1 of EN 12921-1:2004.

6.2 Mechanical

See 6.2 of EN 12921-1:2004.

6.3 Electrical

See 6.3 of EN 12921-1:2004.

Verification of requirements under 5.3 shall be carried out by visual inspection and according to EN 60204-1 and the following tests shall be performed on all cleaning machines with the electrical equipment connected to the main supply:

— continuity of the protective bonding circuit (see 20.2 of EN 60204-1:1997);

— insulation resistance tests (see 20.3 of EN 60204-1:1997);

— voltage tests (see 20.4 of EN 60204-1:1997);

— protection against residual voltage (see 20.5 of EN 60204-1:1997);

— functional tests (see 20.7 of EN 60204-1:1997).

6.4 Thermal

See 6.4 of EN 12921-1:2004.

6.4.1 Heating systems

See 6.4.2 of EN 12921-1:2004.

6.4.2 Temperature of touchable surfaces

See 6.4.3 of EN 12921-1:2004.

6.5 Noise

See 6.5 of EN 12921-1:2004.

6.6 Material and substances processed, used or emitted by the cleaning machines

See 6.6 of EN 12921-1:2004.

6.6.1 Contact with/or inhalation of dangerous liquids, gases, mists, fumes

Visual inspection of the cleaning machine and checking of the accompanying standards concerning cleaning media and process are requested.

When unexpected ejection of dangerous liquids is possible, as detailed in the requirement of 5.6.2.1, i. e. as the results of a risk assessment, then a visual inspection of the cleaning machine is required.

To meet the requirements of 5.6.2.2, the use of forced ventilation system, simulation and visual inspection of the cleaning machine is required.

To meet the requirements of 5.6.2.3, a visual inspection of the equipment is required.

To meet the requirements of 5.6.2.4 chemical reactions, visual inspection of the equipment.

To meet the requirements of 5.6.2.5 verification shall be carried out according to EN 1717.

6.6.2 Fire and explosion

See 6.6.2 of EN 12921-1:2004.

Visual inspection of the cleaning machine and check of accompanying safety data sheets of substances and compounds of the water based cleaning liquid processed in respect of admissibility for the intended use.

6.7 Hazard combinations

See 6.7 of EN 12921-1:2004.

6.8 Failure of energy supply and other functional disorder

See 6.8 of EN 12921-1:2004.

6.9 Control systems

See 6.10 of EN 12921-1:2004.

7 Information for use

7.1 General

In addition to the requirements described in 7.1, 7.2 and 7.3 of EN 12921-1:2004, the following information for use shall be given:

7.2 Instruction handbook

7.2.1 Relevant indications and/or limitations for the intended use of the cleaning machine with respect to the permitted and non-permitted water based cleaning liquids and chemical reaction.

7.2.2 Indication of colours identifying the different types of cleaning liquids (if applicable).

7.2.3 Information on procedures for handling and mixing of dangerous (unhealthy) cleaners (cleaning agents).

7.2.4 Information concerning the forced ventilation to verify its performance and efficiency.

7.2.5 Information regarding safe cleaning procedures and maintenance of the cleaning machine.

The user shall be informed about residual risks concerning the contact with hazardous substances. The instruction handbook shall contain information about adequate personal protective equipment.

7.2.6 In case of use of water based cleaning liquids that can generate a chemical reaction leading to a potentially explosive atmosphere (see 5.6.3.1) or in a change in composition of the water based cleaning liquid with the same effect (see 5.6.3.3) an area classification of restricted areas and hazardous zones (according to 5.6.3.3 of EN 12921-3:2004) is required.

7.2.7 Information regarding connection of the cleaning machine to the public water supply to prevent backflow.

7.3 Minimum Marking

In addition to marking required in 7.3, 8th indent of EN 12921-1:2004 cleaning machines using water based cleaning liquids shall be marked with:

— limit characteristics of the water based cleaning liquid for which the cleaning machine is designed (e.g. pH value, conductivity of deionised (D.I.) water;

— identifying colours and marking/labelling of fittings on pumps, pipes, tanks, covers and other equipment to prevent mistaken identity of cleaning liquids (e.g. acids, strong alkaline) or mixtures of cleaning liquids, if incompatible with each other;

— maximum temperature for which the machine is designed (if applicable);

— spray pressure (if applicable).

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Annex ZA
(informative)

[A1] Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC, amended by 98/79/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive Machinery 98/37/EC, amended by 98/79/EC.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements (except Essential Requirements 1.2.3, 1.2.4, 1.1.2.c), 3) of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. [A1]

Annex ZB
(informative)

[A1] Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the Recast Machinery Directive 2006/42/EC.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements ((except Essential Requirements 1.2.1, 3rd paragraph, 1.2.3, 1.2.4, 1.1.2.c), 1.7.4.2.o), 3)) of that Directive and associated EFTA regulations.

WARNING – Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. [A1]