

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 626-1:1995

<https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1995>

EUROPEAN STANDARD

EN 626-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 1994

UDC 62-78:614.87

Descriptors: safety of machines, work safety, air pollution, emission, dust, dangerous materials, hazards, generalities, design, safety measures, manufacturers, verification, technical notices, maintenance

English version

**Safety of machinery - Reduction of risks to health
from hazardous substances emitted by machinery
- Part 1: Principles and specifications for
machinery manufacturers**

Sécurité des machines - Réduction des risques
pour la santé résultant de substances
dangereuses émises par des machines - Partie 1:
Principes et spécifications à l'intention des
constructeurs de machines

Sicherheit von Maschinen - Reduzierung des
Gesundheitsrisikos durch Gefahrstoffe, die von
Maschinen ausgehen - Teil 1: Grundsätze und
Festlegungen für Maschinenhersteller

This European Standard was approved by CEN on 1994-09-06. 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 Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents list

0 Introduction	3
1 Scope	3
2 Normative references	3
3 Definitions	4
4 Risk assessment	4
5 Types of emissions	6
6 Requirements and/or measures for elimination and/or reduction of risk	8
7 Information for use and maintenance	8
8 Verification of the safety requirements and/or measures	9
Annex A (informative)	
Examples of measures for the reduction of exposure to hazardous substances	10
Annex B (informative)	
Bibliography	11

Foreword

This European Standard was prepared by CEN/TC 114 "Safety of Machinery" of which the secretariat is held by DIN.

This standard was submitted for Formal Vote, and the result was **positive**.

A part 2 of this standard is under preparation in WG 15. This part will deal with the methodology of verification procedures.

This European Standard has been prepared under a Mandate given to CEN by the Commission of the European Communities and the European Free Trade Association and supports essential requirements of the EC Directive(s).

The Annex A is informative and contains "Examples of measures for the reduction of exposure to hazardous substances", Annex B is informative and contains a "Bibliography".

[SIST EN 626-1:1995](https://standards.iteh.ai/catalog/standards/sist/2aae3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1995)

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 March 1995, and conflicting national standards shall be withdrawn at the latest by March 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

0 Introduction

This standard has been produced to assist designers, manufacturers and other interested bodies to interpret the essential safety requirements in order to achieve conformity with European Legislation on machinery safety.

This is one of a programme of standards produced by CEN/CENELEC under mandates from CEC and EFTA. This programme has been divided into several categories to avoid duplication and to develop a logic which will enable rapid production of standards and easy cross reference between them.

The hierarchy of standards is as follows:

- a) **Type A standards** (generic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery.
- b) **Type B standards** (group safety standards) dealing with one safety aspect or one type of safety related device that can be used across a wide range of machinery:
 - type B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise etc.).
 - type B2 standards are safety related devices (e.g. two hand controls, interlocking devices, pressure sensitive devices etc.).
- c) **Type C standards** (machine safety standards) giving detailed safety requirements or a particular machine or group of machines defined in the scope of the standard.

This is a type B1 standard and its primary purpose is to give guidance to the writers of type C standards when machines are identified as having hazardous substances as a significant risk. This standard may also be used as guidance in controlling the risk where there is no type C standard for a particular machine.

1 Scope

This European Standard deals with principles for the control of risks to health due to hazardous substances from machinery. This European Standard is not applicable to hazardous substances which are a hazard to health solely because of explosive, flammable, high or low temperature, high or low pressure or radioactive properties. (standards.iteh.ai)

2 Normative references

[SIST EN 626-1:1995](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1994)

[https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1994)

[3648f689ab74/sist-en-626-1-1995](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1994)

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1

Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology

- EN 292-2 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications
- prEN 626-2 Safety of machinery - Reduction of risks to health from hazardous substances emitted by machinery - Part 2: Methodology leading to vérification procedures

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 Intended use

see EN 292-1.

3.2 Hazardous substance

Any chemical or biological agent which is hazardous to health, e.g. substances or preparations classified as ¹⁾.

- very toxic;
- toxic;
- harmful;
- corrosive;
- irritant;
- sensitising;
- carcinogenic;
- mutagenic;
- teratogenic;
- pathogenic;
- asphyxiants.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4 Risk assessment

SIST EN 626-1:1995

[https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f589ab74/sist-en-626-1-1995)

[3648f589ab74/sist-en-626-1-1995](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f589ab74/sist-en-626-1-1995)

4.1 An identification of hazards and assessment of the foreseeable risks from substances hazardous to health shall be made by the machinery manufacturer. This shall cover, as far as it is possible, any potential personal exposures arising from the machine at any stage in its life.

Note:

Details of the methodology of the risk assessment are given in EN 292-1.

¹⁾ For EEC countries see also 67/548/EEC and its amendments.

4.2 The level of risk depends on the hazardous properties of the substances, the likelihood that personal exposure will occur and the degree of exposure. The health effects of hazardous substances may be:

- short or long term;
- reversible or irreversible.

4.3 Hazardous substances can be in any physical state (gases, liquids, solids) and can effect the body by:

- inhalation;
- ingestion;
- contact with the skin, eyes and mucous membranes;
- penetration through the skin.

4.4 The hazardous substances may arise from:

- any part of a machine;
- substances present in the machine;
- material arising directly or indirectly from articles and/or substances processed by the machine or used on the machine.

4.5 The stages in the life of a machine may include (see also EN 292-1):

- construction;
- transport and commissioning;
 - transport;
 - installation;
 - commissioning;
- use;
 - operation, including starting up and shutting down;
SIST EN 626-1:1995
<https://standards.iteh.ai/catalog/standards/sist/5aac5c45-dc09-45c9-ab45-3648f689ab74/sist-en-626-1-1995>
 - failure;
 - setting or process changeover;
 - cleaning;
 - adjustment;

ITeH STANDARD PREVIEW
(standards.iteh.ai)

- maintenance and repair;
- de-commissioning, dismantling and, as far as safety is concerned, disposal.

5 Types of emissions

5.1 Airborne emissions

5.1.1 Airborne emissions can be significant sources of exposure to hazardous substances. Inhalation is usually the most significant of all the routes of entry (see 4.3). In addition, airborne emissions may enter the body by the other routes particularly when substances are deposited on surfaces of the body or when they are ingested.

5.1.2 Airborne emissions may arise from various sources including:

- machining e.g. sawing, grinding, sanding, milling;
- evaporation and thermal convection e.g. open tanks, crucibles, solvent baths;
- hot metal processes e.g. welding, brazing, soldering, profile cutting, casting;
- material handling e.g. hopper charging, pneumatic conveying, sack filling;
- spraying e.g. painting, high-pressure cleaning;
- leaks e.g. at pump seals, flanges;
- by-products and effluents e.g. gases from drosses, rubber vulcanisation fumes;
- maintenance e.g. emptying filter bags;
- dismantling processes e.g. breaking lead batteries, stripping asbestos insulation;
- combustion of fuel e.g. internal combustion engine exhausts;
- apparatus for mixing food;
- metal working e.g. nitrosamines from water soluble metal working lubricants.

5.1.3 Some examples of airborne hazardous substances are as follows:

- respiratory irritants e.g. sulfur dioxide, chlorine, cadmium fume;
- sensitizers e.g. isocyanates, enzymes, colophon fumes;
- carcinogens e.g. asbestos, chromium VI, benzene, vinyl chloride monomer;
- fibrogenic dusts e.g. free crystalline silica, asbestos, cobalt;
- asphyxiants e.g. nitrogen, argon, methane;
- biological agents e.g. Legionella pneumophila, dusts from mouldy hay;

- substances which affect specific parts of the body e.g. mercury (nerve system, kidney); lead (nerve system, blood); carbon tetrachloride (nerve system, liver); carbon monoxide (blood).

5.1.4 Airborne emissions may be subject to techniques of evaluation based on the measurement of concentrations of substances in the breathing zone of the persons involved. The results of such measurements are usually compared with suitable criteria .

5.1.5 There are many methods of sampling air and analysing the sample for airborne contaminants. Sampling methods and analytical techniques should be selected according to the nature of the airborne contaminant.

5.2 Non-airborne emissions

5.2.1 Non-airborne emissions can be significant sources of exposure to hazardous substances by ingestion, contact with skin, eyes or mucous membranes or penetration through the skin (see 4.3).

5.2.2 Non-airborne emissions may arise from various circumstances including:

- migration from open sources e.g. splashing and evaporation / condensation leading to secondary emissions;
- opening machinery e.g. for maintenance;
- entry into machinery e.g. for inspection;
- material handling e.g. charging, sampling, disposal;
- handling machinery parts e.g. dismantling;
- incorrect operation e.g. overfilling;
- leaks e.g. at pump seals, flanges;
- ruptures.

5.2.3 Exposure to non-airborne emissions can cause ill-health as a result of a variety of hazardous properties associated with different materials. Same examples include:

- corrosives e.g. sulfuric acid;
- irritants e.g. wet cement; [SIST EN 626-1:1995](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1995)
- sensitizers e.g. chromium compounds, epoxy resins; [3648f689ab74/sist-en-626-1-1995](https://standards.iteh.ai/catalog/standards/sist/3aac3e43-de09-45c9-ab45-3648f689ab74/sist-en-626-1-1995)
- carcinogens e.g. used quenching oil, beryllium oxide, polycyclic aromatic hydrocarbons;
- biological agents e.g. infected cutting oils, infected blood.

The ill-health produced may be local to the point of contact or the results of effects elsewhere in the body (systemic or target organ). In some cases both situations may occur, e.g. phenol.