
**Safety requirements for dry-cleaning
machines using perchloroethylene**

*Exigences de sécurité pour les machines de nettoyage à sec utilisant du
perchloroéthylène*



Contents		Page
1	Scope.....	1
2	Normative references	2
3	Definitions	3
4	Hazards	4
5	Safety requirements and/or measures for the hazards identified in clause 4	6
5.1	Hazards associated with the use of dry-cleaning machines.....	6
5.2	Hazards associated with phases of "life" of a machine other than use	13
6	Verification of safety requirements and/or measures	13
7	Information concerning machine use.....	19
7.1	General	19
7.2	Machine plate.....	19
7.3	Warning notices	20
7.4	Instruction handbook.....	20
7.5	Special points of information and instructions.....	20
Annex		
A	Bibliography	24

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 8230 was prepared by Technical Committee ISO/TC 72, *Textile machinery and machinery for dry-cleaning and industrial laundering*, Subcommittee SC 5 *Industrial laundry and dry-cleaning machinery*.

Annex A of this International Standard is for information only.

Introduction

This International Standard is intended to instruct the designer of dry-cleaning machinery in a systematic manner regarding the relevant essential safety requirements and to suggest possible solutions representing the state of the art with respect to safety.

The extent to which hazards are covered is indicated in the scope of this International Standard. The manufacturer's attention is drawn to the fact that machinery should comply as appropriate with ISO/TR 12100-1 and ISO/TR 12100-2 for hazards which are not covered by this International Standard.

Safety requirements for dry-cleaning machines using perchloroethylene

1 Scope

This International Standard is applicable to closed-circuit dry-cleaning machines of all sizes intended for industrial use (including retail shop operation) for the cleaning of articles made of textile, leather, furs and skins, using perchloroethylene¹⁾ (commonly shortened to perc) only as liquid solvent.

This International Standard is not applicable to:

- machines placed at the disposal of the general public (e.g. self-service);
- open-circuit dry-cleaning machines using perc and working below atmospheric pressure;
- barrier machines;
- ironing presses (see ISO 10472-1 and ISO 10472-6);
- machines with automatic doors;
- ancillary equipment, e.g. room evacuation equipment, waste recuperation systems of the still, external water cooling systems or complementary systems for perc recovery from the oil in the still.

This International Standard identifies all significant hazards arising from the use of the machine with special emphasis on solvent hazards, where "use of the machine" comprises both intended use and foreseeable abnormal situations. No specific technical advice is given for hazards (apart from the use of the machines) arising during construction, transport and commissioning, decommissioning, dismantling and disposal of the machines.

This International Standard applies primarily to machines manufactured after the date of issue of this standard.

It does not give specific technical advice about:

- pneumatic systems;
- noise;
- hazards caused by processing work which may create an explosive atmosphere (e.g. printers' wipers containing a low-flash solvent);
- machines processing loads which may contain "foreign solvents" which could lead to a change in a property (characteristic) of the cleaning solvent perc, e.g. cause foaming or make it carcinogenic;
- hazards caused by neglect of ergonomic principles;
- measures dealing with the containment of pressure in the machine.

The guidance contained in this International Standard is based on the presumption that the designer has completed a risk analysis of the machine under consideration, see EN 1050. This will enable him to identify and fulfill the significant requirements for his machine as stipulated by this International Standard.

Where for clarity an example of a safety measure is given in the text, this should not be considered as the only possible solution. Any other solution leading to the same risk reduction is permissible if an equivalent level of safety is achieved, evidence of which should be given in the manufacturer's documentation.

1) IUPAC name tetrachloroethene, chemical formula $\text{Cl}_2\text{C} = \text{CCl}_2$

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5232:—²⁾, *Graphical symbols for textile machinery*.

ISO 6178:1983, *Centrifuges — Construction and safety rules — Method for the calculation of the tangential stress in the shell of a cylindrical centrifuge rotor*.

ISO 8232:1988, *Closed-circuit dry-cleaning machines — Defining and checking of machine characteristics*.

ISO 10472-1:1997, *Safety requirements for industrial laundry machinery — Part 1: Common requirements*.

ISO 10472-6:1997, *Safety requirements for industrial laundry machinery — Part 6: Ironing and fusing presses*.

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

ISO/TR 12100-1:1992, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*.

ISO/TR 12100-2:1992, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications*.

ISO 13849-1:—³⁾, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*.

ISO 13850:1996, *Safety of machinery — Emergency stop — Principles for design*.

ISO 13852:1996, *Safety of machinery — Safety distances to prevent danger zones from being reached by the upper limbs*.

ISO 13853:—³⁾, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*.

ISO 14119:—³⁾, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*.

EN 614-1:1995, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*.

EN 953:1997, *Safety of machinery — General requirements for the design and construction of guards (fixed, movable)*.

EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and components — Pneumatics*.

EN 1037:1995, *Safety of machinery — Isolation and energy dissipation — Prevention of unexpected start-up*.

EN 1050:1996, *Safety of machinery — Risk assessment*.

EN 60204-1:1992, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*. [IEC 204-1:1992, modified].

²⁾ To be published. (Revision of ISO 5232:1988)

³⁾ To be published.