



National Standards Authority of Ireland

IRISH STANDARD

I.S. EN ISO 23953-2:2005

ICS 97.130.20

**REFRIGERATED DISPLAY CABINETS - PART
2: CLASSIFICATION, REQUIREMENTS AND
TEST CONDITIONS (ISO 23953-2:2005)**

National Standards
Authority of Ireland
Glasnevin, Dublin 9
Ireland

Tel: +353 1 807 3800
Fax: +353 1 807 3838
<http://www.nsai.ie>

Sales
<http://www.standards.ie>

*This Irish Standard was
published under the
authority of the National
Standards Authority of
Ireland and comes into
effect on:
December 7, 2005*

NO COPYING WITHOUT NSAI
PERMISSION EXCEPT AS
PERMITTED BY COPYRIGHT
LAW

© NSAI 2005

Price Code X

Údarás um Chaighdeán Náisiúnta na hÉireann

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 23953-2

October 2005

ICS 97.130.20

Supersedes EN 441-2:1994, EN 441-3:1994, EN 441-4:1994, EN 441-5:1996, EN 441-6:1994, EN 441-7:1994, EN 441-8:1994, EN 441-9:1994, EN 441-10:1994, EN 441-11:1994, EN 441-12:1997.

English Version

Refrigerated display cabinets - Part 2: Classification, requirements and test conditions (ISO 23953-2:2005)

Meubles frigorifiques de vente - Partie 2: Classification, exigences et méthodes d'essai (ISO 23953-2:2005)

Verkaufskühlmöbel - Teil 2: Klassifizierung, Anforderungen und Prüfbedingungen (ISO 23953-2:2005)

This European Standard was approved by CEN on 26 September 2005.

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.

This European Standard exists 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This document (EN ISO 23953-2:2005) has been prepared by Technical Committee CEN/TC 44 "Household refrigerating appliances and commercial refrigeration equipment", the secretariat of which is held by UNI, in collaboration with Technical Committee ISO/TC 86 "Refrigeration and air-conditioning".

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 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

This document supersedes EN 441-2:1994, EN 441-3:1994, EN 441-4:1994, EN 441-5:1996, EN 441-6:1994, EN 441-7:1994, EN 441-8:1994, EN 441-9:1994, EN 441-10:1994, EN 441-11:1994, EN 441-12:1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

INTERNATIONAL
STANDARD

ISO
23953-2

First edition
2005-10-15

**Refrigerated display cabinets —
Part 2:
Classification, requirements and test
conditions**

*Meubles frigorifiques de vente —
Partie 2: Classification, exigences et méthodes d'essai*



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms, definitions, symbols and abbreviated terms	1
3.1 General	2
3.2 Compression-type refrigeration systems	3
3.3 Indirect refrigeration-type systems	3
4 Requirements	4
4.1 Construction	4
4.1.1 General	4
4.1.2 Materials	5
4.1.3 Thermal insulation	6
4.1.4 Refrigerating system	6
4.1.5 Electrical components	7
4.1.6 Temperature display	7
4.2 Operating characteristics	9
4.2.1 Absence of odour and taste	9
4.2.2 Classification according to temperature	9
4.2.3 Defrosting	9
4.2.4 Water vapour condensation	10
4.2.5 Energy consumption	10
5 Tests	10
5.1 General	10
5.2 Tests outside test room	10
5.2.1 Seal test for doors and lids	10
5.2.2 Linear dimensions, areas and volumes	11
5.3 Tests inside test room	11
5.3.1 General conditions	11
5.3.2 Preparation of test cabinet and general test procedures	20
5.3.3 Temperature test	41
5.3.4 Water vapour condensation test	44
5.3.5 Electrical energy consumption test	45
5.3.6 Heat extraction rate measurement when condensing unit is remote from cabinet	45
6 Test report	54
6.1 General	54
6.2 Tests outside test room	54
6.2.1 Seal test of doors and lids	54
6.2.2 Linear dimensions, areas and volumes	55
6.2.3 Test for absence of odour and taste (if applicable)	55
6.3 Tests inside test room	55
6.3.1 General test conditions	55
6.3.2 Cabinet preparation	56
6.3.3 Temperature test	56
6.3.4 Water vapour condensation test	57
6.3.5 Electrical energy consumption test	57
6.3.6 Heat extraction rate measurement when the condensing unit is remote from the cabinet	58
7 Marking	59
7.1 Load limit	59
7.2 Marking plate	60

7.3	Information to be supplied by the manufacturer	60
Annex A (normative) Total display area (TDA)	62	
Annex B (normative) Visibility of products by Arc method (VPA)	69	
Annex C (informative) Comparison between laboratory and in-store conditions	76	
Annex D (informative) Test for absence of odour and taste	77	
Bibliography	79	

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 23953-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 44, *Household refrigerating appliances and commercial refrigeration equipment*, in collaboration with Technical Committee ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 7, *Testing and rating of commercial refrigerated display cabinets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 23953-2, together with the first edition of ISO 23953-1, cancels and replaces ISO 1992-1:1974, ISO 1992-4:1974, ISO 1992-5:1974, ISO 1992-6:1974, ISO 5160-1:1979 and ISO 5160-2:1980, of which it constitutes a technical revision.

ISO 23953 consists of the following parts, under the general title *Refrigerated display cabinets*:

- *Part 1: Vocabulary*
- *Part 2: Classification, requirements and test conditions*



SAI GLOBAL

This is a free 10 page sample. Access the full version online.

The remainder of this document
is available for purchase online at

www.saiglobal.com/shop

SAI Global also carries a wide range of publications from a wide variety of Standards Publishers.



SAI GLOBAL

STANDARDS
Australia



Click on the logos to search the database online.