



*NSF International Standard /
American National Standard*

NSF/ANSI 7 - 2009

Commercial Refrigerators
and Freezers



NSF International, an independent, not-for-profit organization, is dedicated to public health, safety and protection of the environment by developing standards, by providing education and by providing superior third-party conformity assessment services while representing the interest of all stakeholders.

*This Standard is subject to revision.
Contact NSF to confirm this revision is current.*

Users of this Standard may request clarifications and interpretations, or propose revisions by contacting:

Chair, Joint Committee on Food Equipment
c/o NSF International
789 North Dixboro Road, P.O. Box 130140
Ann Arbor, Michigan 48113-0140 USA
Phone: (734) 769-8010 Telex: 753215 NSF INTL
FAX: (734) 769-0109 E-mail: info@nsf.org
Web: <http://www.nsf.org>

NSF International Standard/
American National Standard
for Food Equipment —

**Commercial refrigerators
and freezers**

Standard Developer
NSF International

NSF International Board of Directors

Designated as an ANSI Standard
May 18, 2009
Standards Institute

Recommended for Adoption by
The NSF Joint Committee on Food Equipment
The NSF Council of Public Health Consultants

Adopted by
The NSF Board of Directors
April 1966

Revised October 1970
Revised March 1972
Revised March 1973
Revised November 1983
Revised November 1985
Revised May 1990
Revised March 1997
Revised December 1999
Revised July 2000
Revised April 2001
Revised June 2007
Revised May 2009

Published by

NSF International
PO Box 130140, Ann Arbor, Michigan 48113-0140, USA

For ordering copies or for making inquiries with regard to this Standard, please reference the designation "NSF/ANSI 7-2009."

Copyright 2009 NSF International
Previous editions © 2007, 2001, 2000, 1999, 1997, 1990, 1985, 1983, 1973, 1972, 1970, 1966

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 NSF International.

Printed in the United States of America.

Disclaimers¹

NSF, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of NSF represent its professional judgment. NSF shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. NSF shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

NSF Standards provide basic criteria to promote sanitation and protection of the public health. Provisions for mechanical and electrical safety have not been included in this Standard because governmental agencies or other national standards-setting organizations provide safety requirements.

Participation in NSF Standards development activities by regulatory agency representatives (federal, local, state) shall not constitute their agency's endorsement of NSF or any of its Standards.

Preference is given to the use of performance criteria measurable by examination or testing in NSF Standards development when such performance criteria may reasonably be used in lieu of design, materials, or construction criteria.

The illustrations, if provided, are intended to assist in understanding their adjacent standard requirements. However, the illustrations may not include **all** requirements for a specific product or unit, nor do they show the only method of fabricating such arrangements. Such partial drawings shall not be used to justify improper or incomplete design and construction.

Unless otherwise referenced, the annexes are not considered an integral part of NSF Standards. The annexes are provided as general guidelines to the manufacturer, regulatory agency, user, or certifying organization.

¹ The information contained in this Disclaimer is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. Therefore, this Disclaimer may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

This page is intentionally blank.

Contents

1	General	1
1.2	Scope	1
1.3	Alternate materials, design, and construction	1
1.4	Measurement	1
2	Normative references	1
3	Definitions	2
4	Materials	2
4.1	Conformance to NSF/ANSI 51	3
4.2	Zinc-coated materials	3
4.3	Solder	3
4.4	Gaskets	3
4.5	Canopies and awnings	3
4.6	Storage shelving	3
5	Design and construction	3
5.1	General sanitation	3
5.2	External angles and corners	4
5.3	Fasteners	4
5.4	Joints and seams	4
5.5	Edges and nosings	5
5.6	Reinforcing and framing	5
5.7	Inspection and maintenance panels	5
5.8	Veneers	5
5.9	Doors	5
5.10	Hinges	6
5.11	Door gaskets	6
5.12	Door tracks and guides	6
5.13	Covers	6
5.14	Openings into food zones	7
5.15	Entry ports	7
5.16	Drains	7
5.17	Hardware	7
5.18	Handles and pulls	7
5.19	Latches and catches	7
5.20	Breaker strips	8
5.21	Shelving	8
5.22	Ventilation openings	8
5.23	Louvers	8
5.24	Equipment mounting	8
5.25	Legs and feet	9
5.26	Casters, rollers, and gliders	9
5.27	Insulation	10
5.28	Cutting boards	10
5.29	Temperature controls	10
5.30	Breakable glass components	10
5.31	Food drawers	10
5.32	Food shields	10
6	Storage refrigerators and freezers and refrigerated food transport cabinets	10
6.1	Zinc-coated materials	11
6.2	Internal angles and corners	11
6.3	Joints and seams	11
6.4	Hinges	11

6.5 Casters, rollers, and gliders.....	11
6.6 Refrigeration and cooling components.....	12
6.7 Temperature-indicating devices (thermometers).....	12
6.8 Drains.....	13
6.9 Equipment labeling and literature requirements.....	13
6.10 Performance – storage refrigerators and refrigerated food transport cabinets.....	13
6.11 Performance – storage freezers.....	14
7 Refrigerated buffet units and refrigerated food preparation units.....	16
7.1 Internal angles and corners.....	16
7.2 Equipment labeling and literature requirements.....	16
7.3 Refrigeration and cooling components.....	16
7.4 Temperature-indicating devices (thermometers).....	17
7.5 Performance.....	17
8 Prefabricated walk-in and roll-in refrigerators and freezers.....	19
8.1 Prefabricated walk-in and roll-in refrigerators and freezers.....	19
8.2 Prefabricated walk-in and roll-in refrigerators and freezers used for the storage of food in the original sealed package.....	21
8.3 Equipment labeling and literature requirements.....	22
9 Display refrigerators and freezers.....	23
9.1 Materials.....	23
9.2 Design and construction.....	23
9.3 General sanitation.....	23
9.4 Fasteners.....	23
9.5 Joints and seams.....	23
9.6 Reinforcing and framing.....	24
9.7 Doors.....	24
9.8 Drains.....	24
9.9 Shelving.....	24
9.10 Equipment mounting.....	24
9.11 Refrigeration and cooling components.....	25
9.12 Temperature-indicating devices (thermometers).....	26
9.13 Equipment labeling and literature requirements.....	26
9.14 Performance.....	27
10 Rapid pull-down refrigerators and freezers.....	28
10.1 Internal angles and corners.....	28
10.2 Refrigeration and cooling components.....	28
10.3 Temperature-indicating devices (thermometers).....	29
10.4 Equipment labeling and literature requirements.....	29
10.5 Performance.....	29
Annex A.....	A1
A.1 Open-top refrigeration test medium.....	A1
A.2 Rapid pull-down refrigeration test medium.....	A1
Annex B.....	B1

Foreword²

The purpose of this Standard is to establish minimum food protection and sanitation requirements for the materials, design, construction, and performance of commercial refrigerators and freezers.

This edition of the Standard contains the following revision:

Issue 6

The purpose of this revision was to include acceptance criteria for variable capacity compressors.

Issue 7

The purpose of this revision was to update the Normative References and boilerplate language in Section 5.3 – External angles and corners, 5.5 – Edges and nosings, 5.7 – Reinforcing and framing, 5.9 – Doors, 5.15 – Openings into food zones, 5.21 – Shelving, 5.24 – Equipment mounting, 5.25 – Legs and feet, 5.30 – Breakable glass components, 8.2.12 – Temperature indicating devices, and 9.9 – Shelving.

This Standard was developed by the NSF Joint Committee on Food Equipment using the consensus process described by the American National Standards Institute.

Suggestions for improvement of this Standard are welcome. Comments should be sent to Chair, Joint Committee on Food Equipment, c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan, 48113-0140, USA.

² The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. Therefore, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

This page is intentionally blank.

NSF International

NSF, founded in 1944, is well known for the development of standards, product testing and certification services in the areas of public health, safety and protection of the environment. The NSF Mark is placed on millions of consumer, commercial and industrial products annually and is trusted by users, regulators and manufacturers. Technical resources at NSF include physical and performance testing facilities and analytical chemistry and microbiology laboratories. NSF professionals include engineers, chemists, toxicologists, sanitarians and computer scientists with extensive experience in public health, food safety, water quality and the environment. NSF certification programs are fully accredited by the American National Standards Institute (ANSI), the Dutch Council for Accreditation (RvA) and the Standards Council of Canada (SCC). NSF also provides management system registration services to ISO 9000 and ISO 14000 standards through its subsidiary NSF International Strategic Registrations, Ltd.

NSF maintains laboratories in Michigan, as well as offices in Ann Arbor, MI, and Brussels, Belgium.

Commercial Refrigerator Manufacturers Division/Air Conditioning Refrigeration Institute

The Commercial Refrigerator Manufacturers Association (CRMA) was founded in 1933 as a national trade association dedicated to advancing the common interests of the commercial refrigeration industry. In April 2000, CRMA merged with the Air Conditioning Refrigeration Institute (ARI) to form the Commercial Refrigerator Manufacturers Division/Air Conditioning Refrigeration Institute. CRMD/ARI continues to target three primary objectives:

- to showcase technical and business information to help solve common problems and promote growth in industry.
- to represent the collective voice of the industry with any government organization addressing policies or issues affecting the industry.
- to support high voluntary standards for quality in equipment design and performance.

CRMD/ARI is a not-for-profit corporation of leading businesses meeting international demands for increasingly specialized and efficient refrigeration equipment. CRMD/ARI members serve a wide range of markets, including supermarkets, food stores, convenience stores, restaurants, hotels, motels, food processing establishments, and hospitals.

This page is intentionally blank.

NSF/ANSI International Standard for Food Equipment —

Commercial refrigerators and freezers

Commercial refrigerators and freezers

1 General

1.1 Purpose

This Standard establishes minimum food protection and sanitation requirements for the materials, design, manufacture, construction, and performance of commercial refrigerators and freezers and their related components.

1.2 Scope

This Standard contains requirements for refrigerators and freezers used to store and/or display cold food. The types of refrigerators and freezers covered by this Standard include, but are not limited to: storage refrigerators (e.g., reach-in, under counter, walk-in, roll-in); storage freezers (e.g., reach-in, under counter, walk-in, roll-in); rapid pull-down refrigerators and freezers; refrigerated food transport cabinets; refrigerated buffet units; refrigerated food preparation units; display refrigerators; beverage coolers; and ice cream cabinets.

This Standard does not establish equipment installation requirements. While the requirements of this Standard are intended to ensure that equipment may be installed in a sanitary manner, proper installation of equipment shall be governed by the applicable codes.

Refrigerator and freezer components and materials covered under other NSF or NSF/ANSI Standards or Criteria shall also conform to the requirements therein. This Standard is not intended to restrict new unit design, provided that such design meets the minimum specifications described herein.

1.3 Alternate materials, design, and construction

While specific materials, design, and construction may be stipulated in this Standard, equipment that incorporates alternate materials, design, or construction may be acceptable when such equipment meets the applicable requirements herein.

1.4 Measurement

Decimal and SI conversions provided parenthetically shall be considered equivalent. Metric conversions have been made according to IEEE/ASTM SI 10.

2 Normative references

The following documents contain provisions that, through reference, constitute provisions of this NSF/ANSI Standard. At the time this standard was balloted, the editions listed below were valid. All documents are