

NSF International Standard / American National Standard

NSF/ANSI 51 - 2012

Food Equipment Materials



NSF International, an independent, notfor-profit, non-governmental organization, is dedicated to being the leading global provider of public health and safetybased risk management solutions while serving the interests 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/ANSI 51 - 2012

NSF International Standard/ American National Standard for Food Equipment —

Food equipment materials

Standard Developer **NSF International**

NSF International

Designated as an ANSI Standard January 4, 2012 American National Standards Institute Prepared by The NSF Joint Committee on Food Equipment

Recommended for Adoption by The NSF Council of Public Health Consultants

Adopted by The NSF Board of Directors May 1978

Revised November 1997 Revised May 2002 Revised July 2005 Revised April 2007 Revised April 2009 Revised January 2012

Published by NSF International P. O. 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 51-2012."

Copyright 2012 NSF International Previous editions © 2009, 2007, 2005, 2002. 1997, 1978

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 appendices are not considered an integral part of NSF Standards. The appendices 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 left blank.

Contents

1	General	1 1
	1.3 Measurement	1
2	Normative references	1
3	Definitions	2
4	Material formulation 4.1 General requirements 4.2 Requirements for specific types of materials	2
5	General materials requirements	5
6	Coatings 6.1 Metallic coatings 6.2 Organic coatings 6.3 Performance requirements for coatings	5 6
7	Surface cleanability 7.1 Test method 7.2 Acceptance criteria	8
8	Corrosion resistance	9
9	Abrasion resistance 9.1 Method I (for organic coatings used on food zones direct food contact surfaces) 9.2 Method II (for organic coatings used on splash zones and food zone non-direct	
	food contact surfaces)	10
	9.3 Method III (for organic coatings used on serving and display wares)	10
10	Impact resistance 10.1 Method I (for organic coatings used on food zones direct food contact and	10
	non-direct food contact surfaces) 10.2 Method II (for organic coatings used on splash zones, serving and display	10
	 wares, and specific internal machine surfaces) 10.3 Method III (for specific glass and glass-like coatings used on splash zone 	11
	surfaces) 10.4 Method IV (for glass and glass-like coatings intended for food zone direct food	11
	contact and food zone-serving and display ware)	11
11	Heat resistance	
	11.1 Test method11.2 Acceptance criteria	
12	Adhesion ability12.1Method I (for organic coatings used on food zone – direct food contact surfaces)12.2Method II (for organic coatings used on serving and display wares)	12
An	nex A Table A.I – ASTM Standard Specifications for common metallic coating processes	A1 A1

Annex B 1	
B.1 Purpose	B1
B.2 Preparation of exposure water	B1
B.3 Exposure protocol	B1
Interpretations Annex	Interpretations - 1

Foreword²

The purpose of this Standard is to establish minimum food protection and sanitation requirements for the materials used in the construction of commercial food equipment.

By way of reference, this Standard will define the basic materials requirements for all equipment covered by NSF/ANSI Food Equipment Standards.

This Standard establishes requirements intended to ensure that a material is not formulated such that it may impart deleterious substances to food in its intended end use application. This Standard does not define specific extraction test methods or acceptance criteria to be used to assess the extent of chemical migration from food contact surfaces to food. Instead, the appropriate United States Federal Regulations have been cited as references upon which conformance with this Standard is based. Other NSF/ANSI Standards may establish extraction tests and acceptance criteria, as needed, for specific types of equipment based on the materials used in their construction and the nature of the food contact (i.e., beverage dispensing equipment, ice making equipment).

This Standard establishes cleanability, corrosion resistance, impact resistance, abrasion resistance, heat resistance, and coating adhesion ability requirements and testing methods for food equipment materials of construction, as applicable.

This edition of the Standard contains the following revision:

Issue 10

The purpose of this revision was to update the Normative References and boilerplate language, clarify the requirements for brass and bronze, glass and glass-like materials, and storage shelving intended for wet environments, relocate the lead requirement and test method from NSF/ANSI 4 and the glass materials requirement to NSF/ANSI 51, and expand Fluoropolymer coatings.

The Interpretations Annex contains responses to interpretation requests. The responses will be published in each version of the Standard until such time that the interpretation response is no longer applicable.

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

Suggestions for improvement of this Standard are welcome. Comments should be sent to the Chairperson of the Joint Committee on Food Equipment at <u>standards@nsf.org</u> or c/o NSF International, 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 left blank.

© NSF 2012

NSF/ANSI 51 - 2012

NSF/ANSI Standard for Food Equipment –

Food equipment materials

1 General

1.1 Purpose

This Standard establishes minimum public health and sanitation requirements for materials used in the construction of commercial food equipment. The requirements of this Standard are intended to ensure that the composition and surface finish of food equipment materials are such that a material will not adulterate food nor render food equipment difficult to clean and sanitize.

1.2 Scope

This Standard is applicable to the materials and finishes used in the manufacture of food equipment (e.g., broiler, beverage dispenser, cutting board, stock pot). The Standard is also applicable to components such as tubing, sealants, gaskets, valves, and other items intended for various food equipment applications.

These components shall meet the relevant design and construction requirements of the NSF Standard applicable to the type of food equipment on which the component is used.

The requirements of 4 of this Standard may also be applied separately to determine whether a material is suitable for use in a food zone based on its formulation alone. The other relevant requirements of this Standard, including those for cleanability and corrosion resistance, would apply to the finished product for which the material is used.

Materials other than those specifically mentioned in this Standard may be used provided that such materials meet the minimum requirements described herein.

1.3 Measurement

Decimal and SI conversions provided parenthetically shall be considered equivalent. Metric conversions and significant figure rounding 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 of publication, the editions listed below were valid. All standards are subject to revision, and parties are encouraged to investigate the possibility of applying the recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

21 C.F.R. §§170-199, Food and Drug³

³ Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402-0001 <www.gpo.gov>.