



*NSF International Standard /
American National Standard*

NSF/ANSI 51 - 2017

Food Equipment Materials



NSF International, an independent, not-for-profit, non-governmental organization, is dedicated to being the leading global provider of public health and safety-based 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: [<www.nsf.org>](http://www.nsf.org)

NSF International Standard /
American National Standard
for Food Equipment –

Food equipment materials

Standard Developer
NSF International

Designated as an ANSI Standard
October 10, 2017
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
NSF International
May 1978

Revised November 1997
Revised April 2007
Revised March 2015

Revised May 2002
Revised April 2009
Revised May 2018

Revised July 2005
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 51-2017.”

Copyright 2018 NSF International

Previous editions © 2015, 2012, 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 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.

Contents

1	General	1
1.1	Purpose.....	1
1.2	Scope	1
1.3	Measurement	1
2	Normative references	2
3	Definitions	2
4	Material formulation	3
4.1	General requirements	3
4.2	Requirements for specific types of materials.....	3
5	General materials requirements	5
5.1	Materials shall be smooth and easily cleanable	5
5.2	Corrosion resistance	5
6	Coatings.....	6
6.1	Metallic coatings	6
6.2	Organic coatings	6
7	Surface cleanability	9
7.1	Test method	9
7.2	Acceptance criteria	9
8	Corrosion resistance.....	9
8.1	Test method	9
8.2	Acceptance criteria	10
9	Abrasion resistance	10
9.1	Method I (for organic coatings used on food zones direct food contact surfaces)	10
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)	11
10	Impact resistance.....	11
10.1	Method I (for organic coatings used on food zones direct food contact and non-direct food contact surfaces)	11
10.2	Method II (for organic coatings used on splash zones, serving and display wares, and specific internal machine surfaces)	11
10.3	Method III (for specific glass and glass-like coatings used on splash zone surfaces)	12
10.4	Method IV (for glass and glass-like coatings intended for food zone direct food contact and food zone-serving and display ware).....	12
11	Heat resistance.....	12
11.1	Test method.....	12
11.2	Acceptance criteria	12
12	Adhesion ability.....	13
12.1	Method I (For organic coatings used on food zone – Direct food contact surfaces).....	13
12.2	Method II (for organic coatings used on serving and display wares)	13

Annex A.....	14
Annex B.....	17
Interpretations Annex	19

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 revisions:

Issue 14A

This revision affirms proposed changes and additions to 6.2.2.2 covering organic coatings on splash zone surfaces.

Issue 14B

This revision affirms proposed changes and additions to 6.2.2.4 and Table 6.1 covering organic coatings applied to splash zone surfaces.

Issue 15

This revision affirms proposed changes and additions to 6, regarding the use of organic non-stick coatings on blades of powered slicing equipment.

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. This Standard is maintained on a Continuous Maintenance schedule and can be opened for comment at any time. Comments should be sent to Chair, Joint Committee on Food Equipment at standards@nsf.org, or 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.

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.