9



**NSF** 

NSF International Standard / American National Standard

### NSF/ANSI 44 - 2016

Residential Cation Exchange Water Softeners



NSF International, an independent, notfor-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 Drinking Water Treatment Units 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 44 - 2016

NSF International Standard/ American National Standard for Drinking Water Treatment Units —

# Residential cation exchange water softeners

Standard Developer **NSF International** 

**NSF** International

**Designated as an ANSI standard** September 19, 2016 **American National Standards Institute**  Prepared by The NSF Joint Committee on Drinking Water Treatment Units

Recommended for adoption by **The NSF Council of Public Health Consultants** 

#### Adopted by The NSF Board of Directors December 1987

Revised November 1996 Revised November 1998 Revised September 1999 Revised May 2000 Revised November 2000 Revised January 2001

- Revised February 2002 Editorial revision December 2003 Revised June 2004 Revised October 2007 Revised August 2009 Revised February 2002
- Revised February 2012 Revised December 2013 Revised January 2015 Revised October 2015 Revised January 2017

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 44 –2016."

Copyright 2017 NSF International Previous editions ©2015, 2013, 2012, 2009, 2007, 2004, 2002, 2001, 2000, 1999, 1998, 1996, 1987

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.

### **Disclaimers**<sup>1</sup>

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.

<sup>&</sup>lt;sup>1</sup> 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 Purpose 1.2 Scope 1.3 Alternate materials, design, and construction 1.4 Treatment train	1 1 1	
2	Normative references	1	
3	Definitions	2	
4	Materials 4.1 Materials in contact with drinking water 4.2 Materials evaluation 4.3 Gas chromatography/mass spectroscopy (GC/MS) analysis	2	
5	Structural performance	13 13	
6	Minimum performance requirements	18 19 19 19	
7	Elective performance claims – Test methods 7.1 Scope 7.2 Barium and radium reduction 7.3 Conformance by calculation	33 35	
8	Instruction and information 8.1 Installation, operation, and maintenance instructions 8.2 Data plate 8.3 Performance data sheet	41 43	
Annex AA1			
Anı	Annex BB1		
Annex CC1			

This page is intentionally left blank.

### **Foreword**<sup>2</sup>

The purpose of this Standard is to establish minimum requirements for materials, design, construction, and performance of drinking water treatment units that are designed to reduce specific aesthetic-related contaminants in public or private water supplies. This Standard specifies the minimum product literature and labeling information that a manufacturer must supply to authorized representatives and system owners. Lastly, the Standard provides minimum service-related obligations that the manufacturer must extend to system owners.

This edition of the Standard contains the following revisions:

#### Issue 41

CAS numbers were added to Table 4.1 (previously Table 1) of the materials evaluation criteria.

The tables in this edition have also been changed to reflect the appropriate section in which it is located:

Previous edition of NSF/ANSI 44	Current edition of NSF/ANSI 44
Table 1	Table 4.1
Table 2	Table 4.2
Table 3	Table 4.3
Table 4	Table 4.4
Table 5	Table 5.1
Table 6	Table 6.1

This Standard was developed by the NSF Joint Committee on Drinking Water Treatment Units using the consensus process described by 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 Drinking Water Treatment Units at <u>standards@nsf.org</u> or c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan 48113-0140, USA.

<sup>&</sup>lt;sup>2</sup> 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.

### © 2017 NSF

NSF/ANSI 44 - 2016

## NSF/ANSI Standard for Drinking Water Treatment Units –

### Residential cation exchange water softeners

### 1 General

### 1.1 Purpose

The purpose of this Standard is to establish minimum requirements for materials, design and construction, and performance of residential cation exchange water softeners. This Standard also specifies the minimum product literature that manufacturers shall supply to authorized representatives and owners, as well as the minimum service-related obligations that manufacturers shall extend to owners.

### 1.2 Scope

The manual, autoinitiated, and demand-initiated regeneration residential cation exchange water softeners addressed by this Standard are designed to be used for the removal of hardness and the reduction of specific contaminants from drinking water supplies (public or private) considered to be microbiologically safe and of known quality. Systems with components or functions covered under other NSF or NSF/ANSI Standards or Criteria shall conform to the applicable requirements therein.

### 1.3 Alternate materials, design, and construction

While specific materials, design, and construction may be stipulated in this Standard, systems that incorporate alternate materials, designs, and construction may be acceptable when it is verified that such systems meet the applicable requirements.

### 1.4 Treatment train

A system that contains multiple, sequential treatment technologies for a performance claim under this Standard shall meet the applicable requirements as described in Annex C.

### 2 Normative references

The following documents contain requirements that, by reference in this text, constitute requirements of this Standard. At the time of publication, the indicated editions were valid. All of the documents 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.

NSF/ANSI 53 – Drinking water treatment units – Health effects

NSF/ANSI 61 – Drinking water system components – Health effects

USEPA-600/4-79-020, Methods for the Chemical Analysis of Water and Wastes, March 1983<sup>3</sup>

<sup>&</sup>lt;sup>3</sup> USEPA, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 <www.epa.org>.