

**NEMA Standards Publication TF 2-1993 (R2000, R2005)**

*Uncoated Treated Fiberglass Sleeving*

*Published by:*

**National Electrical Manufacturers Association**

1300 North 17th Street, Suite 1847  
Rosslyn, VA 22209

[www.nema.org](http://www.nema.org)

© Copyright 2005 by the National Electrical Manufacturers Association. All rights including translation into other languages reserved under the Universal Copyright Convention, the Berne Convention for the Protection of Literary and Artistic Works, and the International and Pan American Copyright Conventions.

## **NOTICE AND DISCLAIMER**

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this document.

The National Electrical Manufacturers Association (NEMA) standards and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards and guideline publications.

NEMA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. NEMA disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of your particular purposes or needs. NEMA does not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, NEMA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

NEMA has no power, nor does it undertake to police or enforce compliance with the contents of this document. NEMA does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health or safety-related information in this document shall not be attributable to NEMA and is solely the responsibility of the certifier or maker of the statement.

## CONTENTS

		Page
	Foreword.....	ii
	Scope.....	ii
<b>Section 1</b>	<b>REFERENCED STANDARDS AND DEFINITIONS</b>	
1.1	Referenced Standards.....	1
1.2	Definitions.....	1
<b>Section 2</b>	<b>GENERAL REQUIREMENTS</b>	
2.1	Introduction.....	2
2.2	Types.....	2
2.3	Colors.....	2
2.4	Coil and Spool Lengths.....	2
2.5	Length/Splices.....	2
2.6	Thermal Classification.....	2
<b>Section 3</b>	<b>DIMENSIONAL AND YIELD REQUIREMENTS</b>	
3.1	Inside Diameter and Wall Thickness.....	4
3.2	Yield Requirements.....	4
<b>Section 4</b>	<b>PERFORMANCE REQUIREMENTS</b>	
4.1	Flame Resistance.....	7
<b>Section 5</b>	<b>SAMPLING</b>	
5.1	Sampling Lots.....	8
<b>Section 6</b>	<b>METHODS OF TEST</b>	
6.1	Inside Diameter.....	9
6.1.1	Gage Rods.....	9
6.1.2	Method of Measurement.....	9
6.1.3	Alternate Method of Measurement.....	9
6.1.4	Report.....	10
6.2	Wall Thickness.....	10
6.2.1	Micrometer.....	10
6.2.2	Method of Measurement.....	10
6.2.3	Report.....	10
6.3	Flame Resistance.....	10
6.3.1	Apparatus and Equipment.....	10
6.3.2	Procedure.....	11
6.3.3	Report.....	11
6.4	Yield.....	11
6.4.1	Apparatus.....	11
6.4.2	Procedure.....	12
6.4.3	Report.....	12
 <b>TABLES</b>		
2-1	Number of Allowable Splices.....	3
2-2	Tolerance on Cut Lengths.....	3
3-1	Dimensions and Yield Requirements (Types 1 and 2).....	4
3-2	Dimensional Requirements.....	5
5-1	Sampling Lots.....	8

## Foreword

The Standards Publication has been prepared by the Electrical Tubing and Sleeving Section of the National Electrical Manufacturers Association and its intended primarily to establish test methods and performance characteristics for heat treated (annealed) and saturated fiberglass sleeving.

Parallel standards activities in International Electrotechnical Commission (IEC) Subcommittee 15C "Specifications for Insulating Materials" were considered in the development of this Standards Publication.

In the preparation of this Standards Publication, input of users and other interested parties has been sought and evaluated. Inquiries, comments, and proposed recommended revisions should be submitted to the concerned NEMA Product Subdivision by contacting the:

Vice President, Technical Services Department  
National Electrical Manufacturers Association  
1300 North 17th Street, Suite 1847  
Rosslyn, VA 22209

This Standards Publication was developed by the Tubing and Sleeving Section. Section approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Flexible Insulation and Mica Section was composed of the following members:

Atkins & Pearce—Covington, KY  
Hilec, Inc.—Arcade, NY  
Sofanou Inc.—Troy, MI  
Suflex—Newmarket, NH  
Sumitomo Electric—Santa Clara, CA  
Tyco Electronics/Raychem—Menlo Park, CA

## Scope

This Standards Publication covers physical requirements and methods of testing heat-treated (annealed) and saturated fiberglass sleeving used in the insulation of electrical equipment.