



STANDARD FOR

OPTICAL FIBER

OUTSIDE PLANT COMMUNICATIONS CABLE

Approved by

AMERICAN NATIONAL STANDARDS INSTITUTE

January 17,2012

Publication # ANSI/ICEA S-87-640-2011

Fifth Edition

C 2011 by ICEA

INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

ANSI/ICEA S-87-640-2011

STANDARD FOR OPTICAL FIBER

OUTSIDE PLANT COMMUNICATIONS CABLE

January 17, 2012

Fifth Edition

Published By

Insulated Cable Engineers Association, Inc. (ICEA) P.O. Box 1568 Carrollton, Georgia 30112, USA (770) 830-0369

Approved June 7, 2011, by INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

Approved January 17, 2012, by ANSI ASC C-8 AMERICAN NATIONAL STANDARDS INSTITUTE

Copyrighted by the ICEA

Contents may not be reproduced in any form without permission of the INSULATED CABLE ENGINEERS ASSOCIATION, INC.

Copies of this publication may be ordered online or by contacting:

IHS 15 Inverness Way East Englewood, CO 80113-5776 USA Telephone: (800) 854-7179 www.global.ihs.com

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 Insulated Cable Engineers Association, Inc. (ICEA) 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 persons who have an interest in the topic covered by this publication. While ICEA administers the process and establishes rules to promote fairness in the development of consensus, 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.

ICEA disclaims liability for 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. ICEA disclaims and makes no guaranty or warranty, expressed 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. ICEA 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, ICEA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is ICEA 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.

ICEA has no power, nor does it undertake to police or enforce compliance with the contents of this document. ICEA 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 ICEA and is solely the responsibility of the certifier or maker of the statement.

[This page intentionally blank.]

FOREWORD

(This Foreword is not part of this Standard.)

This Standard provides information on specifying optical fiber cables for outdoor use in telecommunications applications.

The first edition of this Standard was approved by ICEA on March 4, 1992, and the second revision on September 15, 1999. A third revision was approved by ICEA on June 8, 2005. It was published by ICEA, but was not published as an ANSI-approved Standard. Revision 4 of this Standard, approved by ICEA on September 13, 2006, was a republication of revision 3. It was approved by The American National Standards Institute (ANSI) on December 8, 2006 and adopted by the Telecommunications Industry Association (TIA) as TIA-472D000-B in April 2007. The members of the ICEA Communications Cable Division Working Group who participated in the fifth edition of this standard were:

Jim Ryan, Chairman and Editor

| M. D. Kinard | D. Baker | D. Hessong |
|--------------|--------------|-------------|
| P. Fraley | J. Register | J. Shinoski |
| D. Taylor | P. VanVickle | |

This issue replaces the previous issue of ANSI/ICEA S-87-640-2006, *Standard for Optical Fiber Outside Plant Communications Cable*. Major changes in this revision include the following:

- Addition of new fiber types
- Addition of a mid-span buffer tube storage testing
- Addition of a buffer tube kink test
- Addition of all-dielectric self-support cable requirements
- Addition of an informative annex on General Outside Plant Optical Fiber Cable Installation Considerations

This Standard contains eight annexes. Annexes C, D and F are normative and are considered part of this Standard. Annex E is normative and considered part of this Standard when required by the customer. Annexes A, B, G, and H are informative and are not considered part of this Standard.

ICEA Standards are adopted in the public interest and are designed to eliminate misunderstanding between the manufacturer and user and to assist the user in selecting and obtaining proper products for a particular need. The existence of an ICEA Standard does not in any respect preclude the manufacture or use of products not conforming to this Standard.

The user of this Standard is cautioned to observe any applicable health or safety regulations and rules relative to the manufacture and use of cable made in conformity with this Standard. This Standard hereafter assumes that only properly trained personnel using suitable equipment will manufacture, test, install, and/or perform maintenance on cables defined by this Standard.

Questions of interpretation of ICEA Standards can only be accepted in writing and the reply shall be provided in writing. Suggestions for improvements in this Standard are welcome. Questions and suggestions shall be sent to:

Secretary Insulated Cable Engineers Association, Inc. Post Office Box 1568 Carrollton, GA 30112 United States of America

Alternatively, you can contact ICEA by utilizing the *Contact* link in the ICEA web site:

www.icea.net

[This page intentionally blank.]

CONTENTS

| SECTION | PAGE | Ξ |
|---------|---|----|
| PART 1 | INTRODUCTION | 1 |
| 1.1 | Scope | 1 |
| 1.2 | General | 3 |
| 1.3 | Units | 4 |
| 1.4 | Definitions | 4 |
| 1.5 | References | 5 |
| 1.6 | Information to be Supplied by the User | 5 |
| 1.7 | Modification of this Standard | 6 |
| 1.8 | Quality Assurance | 6 |
| 1.9 | Safety Considerations | 6 |
| PART 2 | OPTICAL FIBERS | 8 |
| 2.1 | General | 8 |
| 2.2 | Optical Fiber Classes | 8 |
| 2.3 | Optical Fiber Requirements | 8 |
| 2.4 | Optical Fiber Coating and Requirements | 8 |
| PART 3 | OPTICAL FIBER CORE UNITS | 11 |
| 3.1 | General | 11 |
| 3.2 | Loose Buffer Tubes | 11 |
| 3.3 | Optical Fiber Bundles | 12 |
| 3.4 | Optical Fiber Ribbons | 12 |
| 3.5 | Tight Buffers | 13 |
| PART 4 | CABLE AND COMPONENT ASSEMBLY AND IDENTIFICATION | 14 |
| 4.1 | Cabling of Multi-Fiber and Composite Optical Cables | 14 |
| 4.2 | Identification of Fibers within a Unit | 14 |
| 4.3 | Identification of Units within a Cable | 14 |
| 4.4 | Identification of Conductors in Composite Cable | 14 |
| 4.5 | Strength Members | 16 |