STANDARD FOR OPTICAL FIBER OUTSIDE PLANT MICRODUCT CABLES

ANSI/ICEA S-122-744-2016

INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

STANDARD FOR

OPTICAL FIBER

OUTSIDE PLANT MICRODUCT CABLES

Publication S-122-744

First Edition – July 22, 2016

Published By
Insulated Cable Engineers Association, Inc. (ICEA)
www.icea.net

Approved July 22, 2016, by
INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

ANSI version: Approval January 6, 2017, by ANSI ASC C-8
AMERICAN NATIONAL STANDARDS INSTITUTE

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

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 his particular need. Existence of an ICEA Standard does not in any respect preclude the manufacture or use of products not conforming to the 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 perform manufacture, testing, installation, and maintenance of cables defined by this Standard.

Requests for interpretation of this ICEA Standard must be submitted in writing (hard copy, email, or fax) to the Insulated Cable Engineers Association to the ICEA Secretary. The mailing address of ICEA Headquarters and a Contact link are shown on the ICEA web site – www.icea.net. An official written interpretation will be provided.

The members of the ICEA Communications Cable Section, Working Group 744, who participated in this project, were:

Jim Register, Chairman and Editor

G. Dorna	R. Gould	N. Hatch
M. D. Kinard	J. Lichtenwalner	J. Mohler
D. Parke	M. Rainville	J. Ryan
T. Schmalzigaug	R. Stanko	R. Stevens
D. Taylor	T. West	H. Toland
P. VanVickle		

[This page intentionally blank.]

CONTENTS

CONTENTS (cont.)

CONTENTS (cont.)

CONTENTS (cont.)

SECTION **PAGE**

FIGURES

TABLES **PAGE**

[This page intentionally blank.]

PART 1

INTRODUCTION

1.1 Scope

1.1.1 Products

This Standard covers performance requirements for microduct optical fiber outside plant cables intended for installation in microducts, typically by blowing in using commercially available equipment intended for this application. Products covered by this Standard are intended only for operation under conditions normally found in outside plant communication systems. Typically, these products are installed in protected ducts but may be also run for short distances in both exposed areas and in concealed areas (such as handholes), with or without external protection. Due to the thinner jacket usually associated with microduct cables, they typically do not have the jacket durability to be pulled into conduit for long distances even at or below the rated tensile strength. Additionally, the impact resistance, compression resistance and tensile strength requirements for cables covered by this Standard may be significantly lower than those for conventional outside plant cables covered by ICEA-640. Therefore, installation of cables covered by this Standard by techniques such as capstan pulling, aerial lashing, trenching, and direct burial is not recommended.

1.1.2 Applications Space

Products covered by this Standard are intended for operation only under conditions normally found in communications systems. These products normally convey communications signals (voice, video, and data) including but not limited to point-to-point or point-to-multipoint installations. Products covered by this Standard may be factory terminated with connectors or splicing modules.

1.1.3 Temperature Ranges

The normal temperature ranges for cables covered by this Standard are given in Table 1.1.

Two temperature performance levels are specified for this Standard.

- Standard temperature performance - This level is considered to be in line with normal outside plant performance levels. This category will ensure performance in scenarios that include transitions between unconnected microduct systems or between a microduct system and some other protective structure, such as a conduit or tray.

- Moderate temperature performance – This level is characterized for installation in moderate climates or when the cable will not be exposed to short transitions below -30 °C (-22 °F).

If “Moderate Temperature Performance” is specified, the performance level should be clearly stated. This may be done using product specification sheets, customer quotations, or similar means.

Table 1.1 - Cable normal temperature ranges

Standard Temperature Performance	°C	(°F)
Operation	-40 to +70	(-40 to +158)
Storage and Shipping	-40 to +70	(-40 to +158)
Installation	-30 to +60	(-22 to +140)

Moderate Temperature Performance	°C	(°F)
Operation	-30 to +60	(-22 to +140)
Storage and Shipping	-30 to +60	(-22 to +140)
Installation	-10 to +50	(+14 to +122)

1.1.4 Tensile Rating

The minimum tensile rating for cables covered by this Standard is based on cable weight and is equivalent to the force exerted by the weight of 1,000 m of cable. While microduct cable should be blown into duct instead of pulled, a tensile strength is specified to provide durability and handling robustness.

1.1.5 Minimum Bend Diameter

The standard minimum bend diameters for cables covered by this Standard are:

Residual Condition (Installed):	20X Cable OD, or 30X for ribbon cables (≥ 216 fibers)
Loaded Condition (During Installation):	40X Cable OD

For very small cables, such as those installed in miniature ducts, manufacturers may specify a fixed cable minimum bend diameter (e.g., 300 mm) that is independent of the cable outer diameter (OD).