



**STANDARD FOR OPTICAL FIBER
OUTSIDE PLANT MICRODUCT CABLES**

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INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

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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.

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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).