



**STANDARD FOR HYBRID OPTICAL FIBER
AND POWER CABLE FOR USE IN LIMITED
POWER CIRCUITS**

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HYBRID OPTICAL FIBER AND POWER CABLE FOR USE IN LIMITED
POWER CIRCUITS

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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

This Standard covers performance requirements for limited power hybrid copper and fiber communications cables intended for use in the buildings, or for short distances external to the building of communications users. The optical fiber is intended for communications use while the copper conductors are intended for limited power applications in accordance with Articles 725 and 800 of the National Electric Code (NEC) ANSI/NFPA 70. Typically, these cables utilize conductor sizes that range from 10 AWG to 20 AWG. Generally these cables are limited to a maximum of 100 VA. However, refer to NEC document for detailed requirements. Materials, constructions and performance requirements are included in the Standard, together with applicable test procedures.

Products covered by this standard are intended only for operation under conditions normally found in communication systems. Typically, these products are installed both in exposed areas (surface mounted to walls or building baseboards or in non-stationary configurations) and in concealed areas (within walls, attics, etc.), with or without external protection (such as conduit), depending upon product type and specific use. These products normally convey communications signals (voice, video, data, etc.) from place to place within a building. Products covered by this Standard may be factory terminated with connectors or splicing modules.

This standard is intended to serve as a reference to the most recent appropriate standards; ICEA S-83-596 for optical fiber communications cables intended for indoor use, ICEA S-104-696 for optical fiber communications cables intended for indoor-outdoor use and UL13 for Power Limited Circuit Cables with the addition of any additional requirements to ensure a functional cable design.

This standard is written from the application perspective of an Distributed Antenna System (DAS), however, other use cases that involve hybrid fiber/copper in a Limited Power application as defined by the National Electric Code, are considered to apply.

The normal temperature ranges for cables covered by this Standard are listed in Table 1-1:

Table 1-1
Temperature Ranges

	Riser and General Purpose		Plenum	
	°C	°F	°C	°F
<u>Indoor</u>				
Operation	-20 to +70	-4 to 158	0 to +70	32 to 158
Storage and Shipping	-40 to +70	-40 to 158	-40 to +70	-40 to 158
Installation	-10 to 60	14 to 140	0 to 60	32 to 140
<u>Indoor-Outdoor</u>				
Operation	-40 to +70	-40 to 158	-40 to +70	-40 to 158
Storage and Shipping	-40 to +70	-40 to 158	-40 to +70	-40 to 158
Installation	-10 to 60	14 to 140	0 to 60	32 to 140

The standard installation tensile rating for cables is specified in Table 7-2.

<u>Standard Minimum Bend Diameter</u>	<u>Interconnect</u>	<u>All Other Cables</u>
Unloaded Condition (Installed):	50 mm	20 x Cable OD
Loaded Condition (During Installation):	100 mm	40 x Cable OD

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

For cables not having a circular cross-section, bend diameter requirements are to be determined using the thickness (minor axis) as the cable diameter and bending in the direction of the preferential bend.

Products covered by this Standard shall comply with the pertinent Fire Resistance Code(s) described in Section 1.9.

1.2 GENERAL

This publication is arranged so that cables may be selected from numerous constructions covering a broad range of installation and service conditions.

Parts 2 and 3 designate the materials, material characteristics, dimensions and tests applicable to the particular component.

Part 4 covers assembly, cabling, and identification of the individual optical fiber.

Part 5 includes cable coverings.

Part 6 provides other pertinent requirements not otherwise addressed by Parts 1 through 5 or by Parts 7 and 8 of this Standard.