UL 1655

STANDARD FOR SAFETY

Community-Antenna Television Cables

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER
REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

UL Standard for Safety for Community-Antenna Television Cables, UL 1655

Third Edition, Dated October 23, 2024

Summary of Topics

This new Third Edition of ANSI/UL 1655 dated October 23, 2024 incorporates editorial changes including renumbering and reformatting to align with current style.

The requirements are substantially in accordance with Proposal(s) on this subject dated August 2, 2024.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of ULSE Inc. (ULSE).

ULSE provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will ULSE be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if ULSE or an authorized ULSE representative has been advised of the possibility of such damage. In no event shall ULSE's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold ULSE harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

No Text on This Page

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

UL 1655

Standard for Community-Antenna Television Cables

First Edition – November, 1997
Second Edition – April, 2009

Third Edition

October 23, 2024

This ANSI/UL Standard for Safety consists of the Third Edition.

The most recent designation of ANSI/UL 1655 as an American National Standard (ANSI) occurred on October 23, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at https://csds.ul.com.

Our Standards for Safety are copyrighted by ULSE Inc. Neither a printed nor electronic copy of a Standard should be altered in any way. All of our Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of ULSE Inc.

© 2024 ULSE Inc. All rights reserved.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

No Text on This Page

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

CONTENTS

INTRODUCTION

1 Scope 5
2 Units of Measurement 6
3 Referenced Publications 7

CONSTRUCTION

4 Materials 7
5 Center Conductor of Coaxial Members 8
6 Metal Coating of Center Conductor 10
7 Insulation 11
7.1 Material and application 11
7.2 Thicknesses 12
8 Coaxial Members 13
9 Electromagnetic Shields 13
10 Optical-Fiber Members 14
11 Binders 15
12 Communications Conductor 15
13 Core Wrap 15
14 Assembly of a Multiple-Member Cable 15
15 Overall Cable Jacket 16
15.1 General 16
15.2 Flexibility test 16
15.3 Physical properties test 17
15.4 Jacket 17
16 Metal Covering (Armor) 19
16.1 General 19
16.2 Smooth metal sheath 19
16.3 Welded and corrugated metal sheath 20
16.4 Extruded and corrugated metal sheath 20
16.5 Interlocked armor 21
17 Jacket over Armor 22
18 Metallic Messenger 23

MANUFACTURING AND PRODUCTION TESTS

19 Production Line Testing (Spark and Dielectric) 23
19.1 Alternative spark and dielectric voltage-withstand tests of all coaxial members 23

PERFORMANCE

20 Continuity Test of Center and Outer Conductors and Shields 24
21 D-C Resistance Test of Center Conductors 24
21.1 Requirements 24
22 Cold Bend Test of the Complete Cable 29
23 Smoke and Flame Testing of Plenum Cables 29
24 Flame Testing of Riser Cables 30
25 VW-1 (Vertical-Specimen) Flame Test of Limited-Use Cables 30
26 Alternative Vertical-Tray Flame Tests of General-Purpose Cables 30
26.1 Choice of test by the manufacturer 30
26.2 Changes in construction 30

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

26.3 UL test 31
26.4 FT4/IEEE 1202 test 31
27 Sunlight-Resistance Test 31
28 Crushing Resistance Test of Center-Conductor Insulation 31
29 Crushing Test of Cable Marked for Direct Burial 32
30 Copper Sulphate Test of Zinc Coating on Steel Strip for and from Interlocked Steel Armor 33
31 Tension Test of Interlocked Steel or Aluminum Armor 35
32 Flexibility Test of Cable Having Interlocked Armor or a Smooth or Corrugated Metal Sheath 37
33 Durability Test of Ink Printing 38

MARKINGS

34 Intervals 38
35 Coding 38
36 Information on or in the Cable 38
37 Information on the Tag, Reel, or Carton 41
38 Multiple Markings 41
39 Date of Manufacture 42

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

INTRODUCTION

1 Scope

1.1 This Standard states the construction, test, and marking requirements covering the safety of single and multiple coaxial and coaxial/optical-fiber cables for the distribution of radio frequency signals such as employed in a community antenna television system, and for supplying low-energy power at a potential not exceeding 60 volts to equipment directly associated with the signal distribution. These are power-limited cables and are of the following types for installation and use as the CATV cables specified in Article 820 and other applicable parts of the National Electrical Code (NEC), NFPA 70. Electrically nonconductive material separates each optical-fiber member from the rest of the cable.

a) PLENUM CABLES – Type CATVP (coaxial) and Type CATVP-OF (coaxial/optical-fiber). These cables are for installation as specified in Section 800.179(A) of the National Electrical Code, NFPA 70 in a duct, plenum, or other space used to transport environmental air without the cable being enclosed in raceway in that space.

b) RISER CABLES – Type CATVR (coaxial) and Type CATVR-OF (coaxial/optical-fiber). These cables are for installation as specified in Section 800.179(B) of the National Electrical Code, NFPA 70 in vertical runs in a shaft or for vertical runs that penetrate more than one floor.

c) GENERAL-PURPOSE CABLES – Type CATV (coaxial) and Type CATV-OF (coaxial/optical-fiber). These cables are general-applications commercial cables for use as specified in Section 800.179(C) of the National Electrical Code, NFPA 70.

d) LIMITED-USE CABLES – Type CATVX (coaxial) and Type CATVX-OF (coaxial/optical-fiber). These are limited use cables as specified in Section 800.179(D) of the National Electrical Code, NFPA 70.

1.2 This Standard does not specify the impedance or other signal-carrying characteristics of these cables. This Standard does not cover tests for the signal-carrying performance of these cables.

1.3 Armored cables are covered by interlocked metal strip or a smooth or corrugated metal sheath with or without a jacket over the armor. Cables for encasement in concrete, mortar, other masonry, plaster, or the like have metal armor and a jacket over the armor. Cables for direct burial in the earth (see markings in 1.8) are subject to a 1000-pound crushing test. Cables for direct burial are not required to be armored. Cables for direct burial that are armored have a jacket over the armor. All other cables (unarmored, flat or round) have an overall jacket. Some overall jackets incorporate a nonmetallic messenger. A metallic messenger may be joined to the cable jacket by an interconnecting web.

1.4 Cables of a CATV type do not have a voltage rating.

1.5 Cables of materials that qualify for temperatures above 60 °C (140 °F) are marked with a temperature rating of 75, 90, 105, 125, 150, 200 °C or 250 °C (167, 194, 221, 257, 302, 392 °F or 482 °F). Temperature marking is not required for cables that qualify for a temperature rating of 60 °C (140 °F).

1.6 Cables that contain one or more electromagnetic shields in addition to the outer conductors of the coaxial members (these shields are identified as "additional" in 9.1) are not required to be marked to indicate the presence of the additional shielding. A shielded cable that is marked has "shielded" on the tag and either on the overall cable jacket or legible through the jacket.

1.7 Cables that qualify for exposure to sunlight (720-hour sunlight-resistance test – see 27.1) have the designation "sun res" or "sunlight resistant" on the tag and either on the overall cable jacket or legible through the jacket.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.