SCTE | STANDARDS

Interface Practices Subcommittee

SCTE STANDARD

SCTE 29 2018 (R2024)

Torque Requirements for Bond Wire Penetration of Bonding Set Screw

NOTICE

The Society of Cable Telecommunications Engineers (SCTE) Standards and Operational Practices (hereafter called "documents") are intended to serve the public interest by providing specifications, test methods and procedures that promote uniformity of product, interoperability, interchangeability, best practices, and the long term reliability of broadband communications facilities. These documents shall not in any way preclude any member or non-member of SCTE from manufacturing or selling products not conforming to such documents, nor shall the existence of such standards preclude their voluntary use by those other than SCTE members.

SCTE assumes no obligations or liability whatsoever to any party who may adopt the documents. Such adopting party assumes all risks associated with adoption of these documents and accepts full responsibility for any damage and/or claims arising from the adoption of such documents.

NOTE: The user's attention is called to the possibility that compliance with this document may require the use of an invention covered by patent rights. By publication of this document, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the standards developer. SCTE shall not be responsible for identifying patents for which a license may be required or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Patent holders who believe that they hold patents which are essential to the implementation of this document have been requested to provide information about those patents and any related licensing terms and conditions. Any such declarations made before or after publication of this document are available on the SCTE web site at https://scte.org.

140 Philips Road
Exton, PA 19341

Document Tags

☒ Specification	☐ Checklist	☐ Facility
☐ Test or Measurement	☐ Metric	☒ Access Network
☐ Architecture or Framework	☐ Cloud	☐ Customer Premises
☐ Procedure, Process or Method		

Document Release History

Release	Date
SCTE 29 2001	*2001*
SCTE 29 2007	*2007*
SCTE 29 2012	*2012*
SCTE 29 2018	*2018*
SCTE 29 2018 (R2024)	*2/2/2024*

Note: Standards that are released multiple times in the same year use: a, b, c, etc. to indicate normative balloted updates and/or r1, r2, r3, etc. to indicate editorial changes to a released document after the year.

Note: This document is a reaffirmation of SCTE 29 2018. No substantive changes have been made to this document. Information components may have been updated such as the title page, NOTICE text, headers, and footers.

Table of Contents

1. Introduction

1.1. Scope

This test procedure will determine the torque required for a bonding fastener to penetrate a bonding wire to the appropriate depth. Bonding wire penetration should be 25 +/-1% of wire diameter.

1.2. Benefits

Proper attachment of the bonding wire to the bonding block will eliminate:

- High resistance junction that will mitigate the ground between the cable system and the electrical grid.
- Excessive wire penetration that could lead to loss of the ground connection.

2. Normative References

2.1. SCTE References

- ANSI/SCTE 129 2017, Drop Passives: Bonding Blocks (Without Surge Protection)

2.2. Standards from Other Organizations

- No normative references are applicable.

2.3. Published Materials

- No normative references are applicable.

3. Compliance Notation

shall	This word or the adjective "***required***" means that the item is an absolute requirement of this document.
shall not	This phrase means that the item is an absolute prohibition of this document.
forbidden	This word means the value specified shall never be used.
should	This word or the adjective "*recommended*" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
should not	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
may	This word or the adjective "*optional*" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
deprecated	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

4. Abbreviations and Definitions

4.1. Abbreviations

mm	millimeter
ASTM	ASTM International
AWG	American Wire Gauge
SCTE	Society of Cable Telecommunications Engineers

4.2. Definitions

pitch	Pitch is the distance between adjacent threads

5. Test Equipment

- Wright Tools Torque Wrench model 2471 or equivalent
- Square drive socket to fit bonding screw heads

6. Test Samples

- 6 ea. drop bonding blocks (3 different manufacturers)
- 6 ea. subscriber splitters (3 different manufacturers)
- Bonding wire: 12 each 4 inch long pieces of 6 awg, 10 awg, 12 awg and 14 awg bare copper wire that has been manufactured in accordance to ASTM B3 - 01.

7. Test Method

1. Mount unit under test in a vice or attach unit to a stationary object using screws and holes built into product for said purpose.
2. Using torque wrench and an appropriately sized socket, slowly tighten screw onto bonding wire, contacting firmly but not penetrating the wire.
3. Tighten screw, depending on wire diameter and screw thread, by the rotation angle noted below. This rotation corresponds to 25 +/-1% wire penetration.
    a. For 32 threads per inch or 0.8mm pitch bonding screws:
        i. 6 AWG wire: 470º, 10 AWG wire: 300º, 12 AWG wire: 230º, 14 AWG wire: 180º
    b. For 24 threads per inch or 1.0mm pitch bonding screws:
        i. 6 AWG wire: 360º, 10 AWG wire: 230º, 12 AWG wire: 180º, 14 AWG wire: 140º
4. Note the torque just as the rotation limit is reached, and record. Repeat for all samples.

8. Measurements And Calculations

8.1. Bond wire typical diameters:

Type		O.D. (TYPICAL)
6 AWG	=	.1610"
10 AWG	=	.1050"
12 AWG	=	.0800"
14 AWG	=	.0635"

8.2. Penetration of 25 +/-1%

Wire Size	O.D.	25% Penetration	24% to 26% penetration
6 AWG	.1610"	.040"	.038 to .041"
10 AWG	.1050"	.026"	.025 to .027"
12 AWG	.0800"	.020"	.019 to .021"
14 AWG	.0635"	.0158"	.015 to .0165"

9. Test Results

Sample #	**Torque at end of rotation**

