



Designation: C 954 – 04

Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness¹

This standard is issued under the fixed designation C 954; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers minimum requirements for steel drill screws for use in fastening gypsum panel products or metal plaster bases to steel members from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in thickness.

1.2 This specification also covers physical properties and test methods for determining performance requirements.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 The following safety hazards caveat pertains only to the test methods described in this specification. *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

- 2.1 *ASTM Standards*:²
- A 510 Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
 - C 11 Terminology Relating to Gypsum and Related Building Materials and Systems
 - C 36 Specification for Gypsum Wallboard
 - C 1513 Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections

3. Terminology

3.1 Definitions:

¹ This specification is under the jurisdiction of ASTM Committee C11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.02 on Specifications and Test Methods for Accessories and Related Products.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.1 For definitions relating to gypsum and related building materials and systems, see Terminology C 11.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *steel drill screw*—self-drilling tapping screw with the ability to drill its own hole, form or cut mating threads without deforming its own threads or breaking during assembly.

4. Materials

4.1 Screws shall be manufactured from Grade 1018 to 1022 steel wire manufactured in accordance with Specification A 510.

5. Physical Properties

5.1 Metallurgical Requirements:

5.1.1 The surface of the screw shall be carbonitrided to a depth of 0.004 to 0.008 in. (0.10 to 0.20 mm).

5.1.2 The core hardness shall be 32 to 40 HRB after being drawn at a minimum temperature of 625 °F (330 °C).

5.1.3 The screw shall have no band of free ferrite between the case and core nor shall the case contain appreciable amounts of retained austenite or other soft constituents.

5.1.4 Surface hardness shall be determined by a micro hardness instrument at “the root of the thread profile,” as exposed by removal of enough material to form a flat surface along the length of the screw.

5.1.5 *Ductility*—Screws shall have sufficient ductility to be able to withstand a 5° bend without visible signs of fracture when tested as specified in paragraph 8.2.1 of Specification C 1513.

5.2 Dimensions and Permissible Variations:

5.2.1 General:

5.2.1.1 *Head Diameter*—The head of the screw shall not be out of round more than 0.021 in. (0.51 mm) and have the following shape and dimensions:

5.2.1.2 *Screw Diameter*—Screws shall have a major diameter not less than 0.136 in. (3.45 mm).

5.2.1.3 *Points*, shall provide for self-drilling into steel studs from 0.333 in. (0.84 mm) to 0.112 in. (2.84 mm) in thickness and meet the performance tests in Section 6.

*A Summary of Changes section appears at the end of this standard.