



Designation: C1925 – 22

Standard Test Method for
Strength Properties of Direct Hung, Suspended T-bar Type
Ceiling System Components Intended to Receive Gypsum
Panel Products¹

This standard is issued under the fixed designation C1925; 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.

1. Scope

1.1 This test method covers metal ceiling suspension systems used primarily to support screw-attached gypsum panel products.

1.2 The method of determining strength properties of suspended ceiling grid system components is as follows:

Tests	Sections
Uniform Load Testing	6 – 10
Connection Strength Testing	11 – 15
Wire Pullout Resistance	16 – 20

1.3 The values stated in inch-pound and SI (metric) units are to be regarded separately as standard. Within the text, the SI (metric) units are shown in brackets. The values stated in each system of units shall be used independently of the other. Values from the two systems of units shall not be combined.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²
C11 Terminology Relating to Gypsum and Related Building Materials and Systems

¹ This test method 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.

C754 Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
E631 Terminology of Building Constructions
2.2 *Other Standards:*³
AISI S220 North American Standard for Cold-Formed Steel Nonstructural Framing

3. Terminology

3.1 For definitions relating to building constructions, see Terminology **E631**.
3.2 For definitions relating to gypsum and related building materials and systems, see Terminology **C11**.
3.3 *Definitions of Terms Specific to This Standard:*
3.3.1 *cross runner, n*—a member installed perpendicularly to the main runner members designed to receive screw-attached gypsum panel products.
3.3.2 *grid suspension system, n*—a ceiling system composed of modular interlocking steel components designed to receive screw-attached gypsum panel product.
3.3.3 *main runner, n*—the main support member of a grid suspension system that receives cross runner members.
3.3.4 *suspended ceiling, n*—a ceiling in which the main runner members and cross runner members are suspended below the structural members of the building.
3.3.5 *ultimate load, n*—the maximum load applied before test specimen failure.

4. Summary of Test Method

4.1 This test method can be used to determine the strength properties of nonstructural steel framing members to receive screw-attached gypsum panel products. Strength properties are determined by application of uniformly distributed loads to suspended ceiling main runner and cross runner members, tension and compression loading to splices, and wire pullout resistance testing.
³ Available from American Iron and Steel (AISI), https://www.steel.org, or the Cold-Formed Steel Engineers Institute (CFSEI), https://www.cfsei.org, 25 Massachusetts Avenue, NW, Suite 800, Washington, DC 20001.

5. Significance and Use

5.1 This test method provides a standard for determining ultimate load and loads at design deflection of main runner and cross runner members to evaluate their suitability for suspended ceiling installations. Design of cold-formed steel non-structural framing members shall be in accordance with AISI S220. Installation of cold-formed steel nonstructural framing members shall be in accordance with Specification C754.

5.2 The procedure detailed in this standard is intended to be used for determining allowable uniform loads for member spans of 2 ft [600 mm] or greater. Spans tested shall be determined by the manufacturer and documented in the test report. Each member shall be tested in both the upward and downward loading directions.

Uniform Load Testing

6. Support Frame Apparatus

6.1 Provide a rectangular support frame having the essential features of the unit described below:

6.2 The support frame (Fig. 1) shall have the capability for length adjustment to permit testing of members on clear spans of various lengths.

6.3 The support frame shall have sufficient stiffness so that no significant deflection occurs during load testing.

6.4 The support frame must allow the test specimen to be simply supported for both the upward and downward loading direction tests (Fig. 2). The specimen supports shall be $\frac{1}{4}$ in. [6 mm] radius, maximum. The supports shall inhibit the runner from any downward vertical movement at the supports, while allowing freedom to move axially in the horizontal direction.

7. Test Specimens

7.1 The members tested shall be identical to the sections used in the final system design. All cutouts, slots, etc., as exist in the system component shall be included in the test specimens evaluated.

7.2 Main runner/cross runner members that are part of a fire resistance rated assembly that contain fire expansion relief cutouts shall be evaluated for load performance where field application of the expansion relief is designed to be more than 3 in. [75 mm] from the closest support point.

7.3 Each weight attachment to the test specimen must be such that the contact surface is no greater than 1 in. [25.4 mm] in the direction of the length of the test specimen to ensure that the weight attachment does not increase the rigidity of the test specimen. The weight attachment device shall bear on either the flange, the bulb, or hanger wire hole in the web of the member.

7.4 The length of the specimen shall not exceed the length of the span being tested by more than 12 in. [300 mm].

7.5 The specimens shall be tested in both upward and downward loading directions (Fig. 2).

8. Preparation of Support Frame Apparatus

8.1 In actual ceiling installations, the lateral (horizontal) buckling of members is prevented by the lateral support provided by intersecting members and screw attached gypsum panel products. When secondary members are used in a test system, they shall provide the needed lateral (horizontal) support but shall not directly contribute to the load-deflection performance in terms of vertical support of the primary member being tested.

8.2 Prevent lateral (horizontal) buckling of the test section by installing secondary members between the test specimen and the vertical sides of the support frame. Install secondary members normal to the direction of the test specimen. Install secondary members no closer than 24 in. [600 mm] apart. Do not use additional materials to provide lateral support.

8.3 The secondary members shall be either interlocking type (such as with use of an actual cross runner member) or non-interlocking type. Where interlocking secondary members are used, assemble them into the test specimen, spaced no

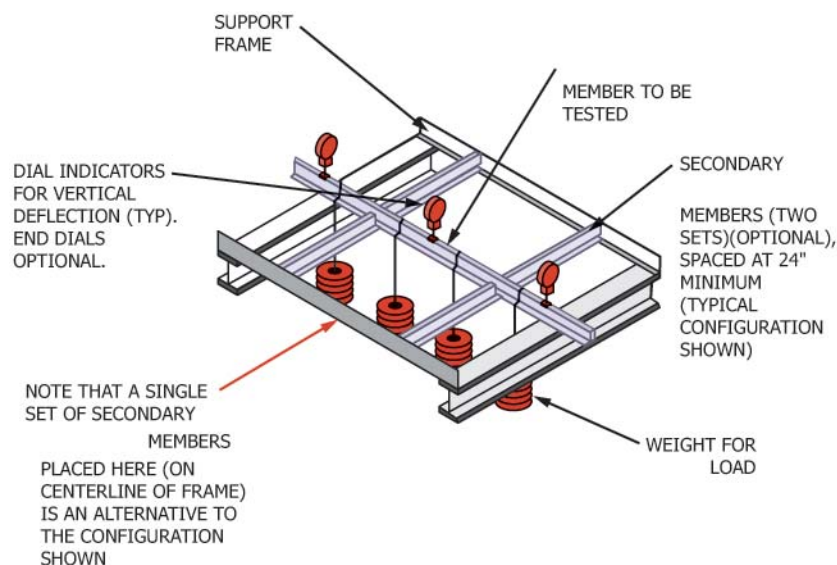


FIG. 1 Support Frame