



Designation: C1629/C1629M – 23

Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels¹

This standard is issued under the fixed designation C1629/C1629M; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This standard establishes classifications of abuse resistance based on the abrasion resistance and impact resistance performance of nondecorated interior gypsum panel products and fiber-reinforced cement panels (abuse resistant wall panels).

1.1.1 This standard is a method of classifying gypsum panel product performance and is not intended to classify systems for abuse resistance.

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

1.3 *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.*

1.4 *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
C473 Test Methods for Physical Testing of Gypsum Panel Products

¹ This classification is under the jurisdiction of ASTM Committee C11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.01 on Specifications and Test Methods for Gypsum 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.

C840 Specification for Application and Finishing of Gypsum Board

C1154 Terminology for Non-Asbestos Fiber-Reinforced Cement Products

D1517 Terminology Relating to Leather

D4977/D4977M Test Method for Granule Adhesion to Mineral-Surfaced Roofing by Abrasion

D5420 Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)

2.2 *ISO Document:*

ISO 6707-1 Building and Civil Engineering—Vocabulary—Part 1: General Terms

2.3 *Federal Specification:*

A-A-50197A Thread, Linen

2.4 *Voluntary Product Standard:*

PS20 American Softwood Lumber Standard

3. Terminology

3.1 Definitions of terms shall be in accordance with Terminologies **C11** and **C1154**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *failure (hard body impact), n*—test result constituted by the penetration or deformation of the wall cavity by the impact head establishing a residual deflection of the panel exceeding the nominal thickness of the test panel.

3.2.2 *structural failure (soft body impact), n*—a test result constituted by the penetration or deformation of the wall cavity by the soft body impact bag establishing a residual deflection of any area on the test panel that exceeds the nominal thickness of the test panel.

3.2.2.1 *deformation, n*—change of shape or dimension or both. **ISO 6707-1**

3.2.2.2 *surface damage, n*—pulverization of the core of the test panel at the point of impact, which is evidenced by cracking, creasing, or other visible damage short of failure as defined in 3.2.2.

3.2.3 *residual deflection, n*—permanent deformation of a building element, component, or structure after removal of applied force.



3.2.3.1 *Discussion*—Also called permanent set or residual deformation.

4. Significance and Use

4.1 Each abuse/impact property of abuse resistant wall panels is divided into three classification levels. The three levels of classification are: Level I, Level II, and Level III, with Level I representing the lowest rating for any given property. The test methods specified are utilized to establish the abuse-resistance classification of an abuse resistant wall panel. Each classification level requires a minimum overall specified performance. Any classified abuse resistant wall panel can be used at a classification level which is rated lower than the highest level qualified.

5. Basis of Classification

5.1 Abuse resistant wall panels are classified into one of three levels of abuse resistance based on minimum performance when tested in accordance with test methods that evaluate surface abrasion, indentation, soft body impact, and hard body impact as specified in 6.1 through 6.4.

5.2 Minimum requirements for each level are as shown in Tables 1-4.

**TABLE 1 Performance Requirements
Surface Abrasion Resistance**

Classification Level	Abraded Depth Maximum in. [mm]
1	0.126 [3.2]
2	0.059 [1.5]
3	0.010 [0.3]

**TABLE 2 Performance Requirements
Indentation Resistance**

Classification Level	Indentation Maximum in. [mm]
1	0.150 [3.8]
2	0.100 [2.5]
3	0.050 [1.3]

**TABLE 3 Performance Requirements
Soft Body Impact Test**

Classification Level	Soft Body Minimum ft-lbf [J]
1	90 [122]
2	195 [265]
3	300 [408]

**TABLE 4 Performance Requirements
Hard Body Impact**

Classification Level	Hard Body Minimum ft-lbf [J]
1	50 [68]
2	100 [136]
3	150 [204]

6. Test Methods

6.1 *Surface Abrasion Test*—This test is conducted in accordance with Test Method **D4977/D4977M** using a total load of 25.0 lb [11.3 kg]. The specimen is conditioned to constant weight at 70 °F [21 °C] and 50 % relative humidity and subjected to 50 abrasion cycles. The abrasive motion on the specimen creates measurable surface wear or indentation which is measured to determine the level of surface abrasion resistance.

NOTE 1—It is especially important to prepare the apparatus and condition the brush as specified in Test Method **D4977/D4977M**.

6.2 *Indentation Test*—This test, conducted in accordance with Test Method **D5420** (Gardner Impact), utilizes procedure GC, with a $\frac{5}{8}$ -in. [15.9 mm] hemispherical head and a 72 in.-lbf [12.6 J] impact energy. The depth of the indentation is measured to determine the level of indentation resistance.

6.3 *Soft Body Impact Test*—This test is conducted in accordance with the method described in **Annex A2**.

6.4 *Hard Body Impact Test*—This test is conducted in accordance with the method described in **Annex A1** or with another apparatus equipped with an equivalent impact head that is capable of delivering equivalent impact loads.