



Designation: D4689 – 12 (Reapproved 2024)

Standard Specification for Adhesive, Casein-Type¹

This standard is issued under the fixed designation D4689; 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 U.S. Department of Defense.

1. Scope

1.1 This specification covers casein and other protein-blend adhesives for use adhering wood to wood. The adhesive type covered by this specification is a dry powder or granular product comprising a mixture of casein, or casein and other protein source, with the necessary dry chemicals to effect solution when the mixture is added to water.

NOTE 1—Although the term *casein adhesive* is used throughout this specification, historically, the adhesive subclass described in 1.1 has been known as casein glue. See Terminology D907, *adhesive types*.

1.2 *Limitations*—Cooked casein adhesives are not covered by this specification.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 The following safety hazards caveat pertains only to the test method portion, Sections 8 through 13, of 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, 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

¹ This specification is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.30 on Wood Adhesives.

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

D899 Practice for Applied Weight Per Unit Area of Liquid Adhesive

D905 Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading

D906 Test Method for Strength Properties of Adhesives in Plywood Type Construction in Shear by Tension Loading

D907 Terminology of Adhesives

D1084 Test Methods for Viscosity of Adhesives

D2556 Test Method for Apparent Viscosity of Adhesives Having Shear-Rate-Dependent Flow Properties Using Rotational Viscometry

D5266 Practice for Estimating the Percentage of Wood Failure in Adhesive Bonded Joints

E104 Practice for Maintaining Constant Relative Humidity by Means of Aqueous Solutions

2.2 Other Standards:³

MIL-STD-129 Marking for Shipment and Storage

FED-STD-123 Marking for Shipment

PPP-C-96 Cans, Metal, 28 Gage and Lighter

PPP-D-723 Drums, Fiber

PPP-D-729 Drums, Shipping and Storage, Steel, 55 Gal (208 L)

3. Terminology

3.1 *Definitions*—Many terms in this specification are defined in Terminology D907.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *lot, n*—adhesive manufactured at one place from the same batch or blends of raw materials subjected to the same operation and conditions.

NOTE 2—In this specification, the maple block lamination in Test Method D905 and the birch plywood construction in Test Method D906 are described as *assemblies*.

4. Significance and Use

4.1 This specification provides testing procedures and specifies requirements to differentiate the physical, adhesive, and durability properties of commercially available casein and casein-protein adhesives. The two classes are defined by water

³ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.