



Designation: D5977 – 23

Standard Specification for High Load Rotational Spherical Bearings for Bridges and Structures¹

This standard is issued under the fixed designation D5977; 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 specification covers bridge bearings that consist of a spherical rotational element, where a stainless steel convex surface slides against a concave carbon steel plate covered with woven or sheet polytetrafluoroethylene (PTFE). The function of the bearing is to transfer loads and to accommodate any relative movement, including rotation between a bridge superstructure and its supporting structure, or both.

1.2 This specification covers the requirements of spherical bearings with a standard horizontal load (a maximum of 10 % of vertical).

1.3 The requirements stated in this specification are the minima necessary for the manufacture of quality bearing devices. It may be necessary to increase these minimum values due to other design conditions.

1.4 *Units*—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.

1.5 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.6 The following safety hazards caveat pertains only to the test method portion, Section 7, 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.*

1.7 *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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

- A36/A36M Specification for Carbon Structural Steel
- A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip (Withdrawn 2014)³
- A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- A304 Specification for Carbon and Alloy Steel Bars Subject to End-Quench Hardenability Requirements
- A572/A572M Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- A588/A588M Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
- A709/A709M Specification for Structural Steel for Bridges
- D638 Test Method for Tensile Properties of Plastics
- D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- D1457 Specification for Polytetrafluoroethylene (PTFE) Molding and Extrusion Materials (Withdrawn 1996)³
- D1777 Test Method for Thickness of Textile Materials
- D2256/D2256M Test Method for Tensile Properties of Yarns by the Single-Strand Method

2.2 AASHTO Standard:⁴

AASHTO Standard Specifications for Highway Bridges

2.3 AWS Standards:⁵

C2.2-67 Metalizing with Aluminum and Zinc for Protection of Iron and Steel

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 The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.

⁵ Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.

¹ This specification is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.32 on Bridges and Structures.

Current edition approved May 1, 2023. Published May 2023. Originally approved in 1996. Last previous edition approved in 2015 as D5977 – 15. DOI: 10.1520/D5977-23.