



Designation: D4014 – 23

Standard Specification for Plain and Steel-Laminated Elastomeric Bearings for Bridges¹

This standard is issued under the fixed designation D4014; 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 bearings which consist of all elastomer or of alternate laminates of elastomer and steel, when the function of the bearings is to transfer loads or accommodate relative movement between a bridge superstructure and its supporting structure, or both.

1.2 The values stated in SI units are to be regarded as the standard.

NOTE 1—The words “elastomer” or “elastomeric” will be used interchangeably with the word “rubber” in this specification.

1.3 The following safety hazards caveat pertains only to the test methods portion, Section 8, 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.*

1.4 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

A36/A36M Specification for Carbon Structural Steel

A1011/A1011M Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

D395 Test Methods for Rubber Property—Compression Set

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D518 Test Method for Rubber Deterioration—Surface Cracking (Withdrawn 2007)³

D573 Test Method for Rubber—Deterioration in an Air Oven

D832 Practice for Rubber Conditioning For Low Temperature Testing

D1149 Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment

D1415 Test Method for Rubber Property—International Hardness

D1418 Practice for Rubber and Rubber Latices—Nomenclature

D2000 Classification System for Rubber Products in Automotive Applications

D2137 Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics

D2240 Test Method for Rubber Property—Durometer Hardness

D3183 Practice for Rubber—Preparation of Pieces for Test Purposes from Products

E4 Practices for Force Calibration and Verification of Testing Machines

2.2 AASHTO Standards:⁴

M 251 Standard Specification for Plain and Laminated Elastomeric Bridge Bearings

3. Terminology

3.1 Definitions:

3.1.1 *design load*—the mean compressive stress applied to the area of the steel laminate.

3.1.2 *external load plate*—a steel plate bonded to the top or bottom elastomeric surface of a bearing, or both.

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.

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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 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>.

3.1.3 *lot*—unless otherwise specified in the contract or purchase order, a lot shall consist of a single type of bearing, of the same design and material, submitted for inspection at the same time.

3.1.4 *plain elastomeric bearing pad*—a bearing that consists only of elastomeric material.

3.1.5 *plain elastomeric sandwich bearing*—a bearing that consists of a single layer of elastomeric material bonded to one or two external load plates (3.1.2).

3.1.6 *steel-laminated elastomeric bearing*—a bearing molded of elastomeric material with one or more steel laminates embedded in and bonded to it, and to which one or two external load plates (3.1.2) may be bonded.

4. Classification

4.1 The bearings are furnished in four types as follows:

4.1.1 Plain elastomeric bearing pad.

4.1.2 Plain elastomeric sandwich bearing.

4.1.3 Steel-laminated elastomeric bearing.

4.1.4 Steel-laminated elastomeric bearing with external load plate(s).

NOTE 2—Examples of the types of elastomeric bearing construction are given in Fig. 1.

NOTE 3—The adjective elastomeric is omitted in this specification when referring to bearing types.

4.2 The elastomer for the manufacture of the bearing is furnished in two types as follows:

4.2.1 *Type CR*—Chloroprene rubber.

4.2.2 *Type NR*—Natural rubber.

4.2.3 If none is specified, then the manufacturer shall use one of those types.

NOTE 4—Appendix X1 relates to elastomeric materials which do not have fully documented in-service records or sufficiently widespread use, or both.

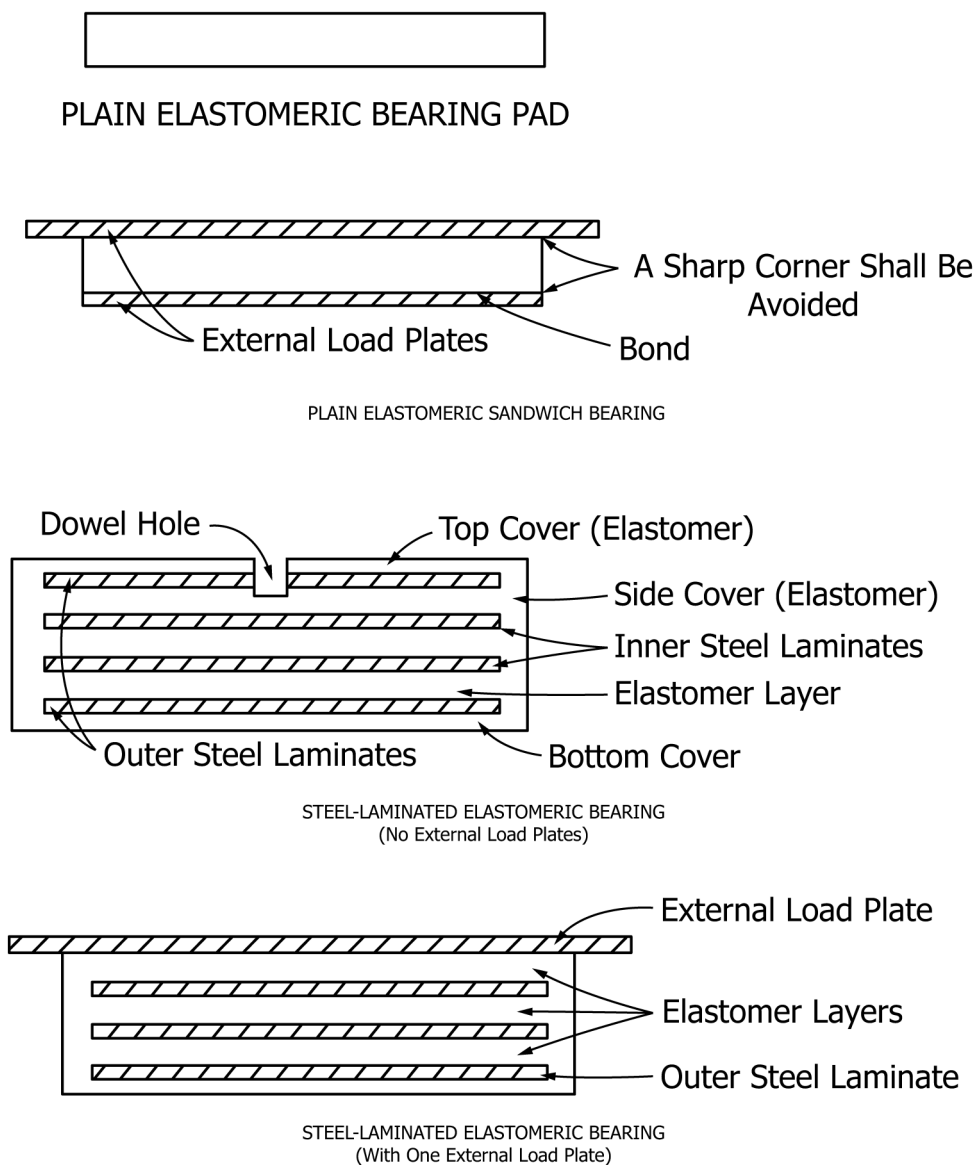


FIG. 1 Examples of the Construction of Elastomeric Bearings