

3741 ELASTOMERIC BEARING PADS

3741.1 SCOPE

Provide elastomeric bearing pads for use in bridges and other structures.

3741.2 REQUIREMENTS

A General

The basis of design for all bearing pads is in conformance with Method A of the *AASHTO LRFD Bridge Design Specifications*.

Use a bearing pad supplier listed on the "Approved/Qualified Products List for Bridge Products, Elastomeric Bearing Pads". Test and manufacture elastomeric bearing pads in accordance with AASHTO M 251 except as modified in this special provision.

Provide bearing pads no greater than ½ in [13 mm] thick, fabricated of all elastomer. Plain elastomer pads may be cut from larger sheets cast to the thickness shown on the plans. Avoid heating or damaging the material when cutting. Ensure the cutting produces smooth edges at least meeting the requirements of ANSI 250 finish.

Provide bearings of laminated construction when pads are greater than ½ in [13 mm] thick. Refer to AASHTO M 251 for tolerances, dimensions, and configurations, except provide elastomer to a thickness of ¼ in [6 mm] within a range from +¹/₈ inch to -¹/₁₆ inch [+3 mm to -2 mm] to cover the top and bottom steel plates.

Provide laminated pads meeting the following requirements or characteristics:

- (1) Consisting of alternate layers of elastomer and metal reinforcement integrally bonded together,
- (2) Containing reinforcement spaced as shown on the plans, and parallel to the top and bottom surfaces of the pad, and
- (3) Including the manufacturer's name or trademark molded into the edge of the pad.

Do not expose the finished laminated pad to temperatures greater than 400°F [205°C].

Cover the edges of metal reinforcement with ¼ in [6 mm] of elastomer.

B Physical Properties

Substitute the requirements of sections 4.1 and 4.2 of AASHTO M 251; comply with B.1 & B.2 in this specification.

B.1 Elastomer

Use elastomer compound containing only virgin crystallization resistant polychloroprene (neoprene) or virgin natural polyisoprene (natural rubber) as the raw polymer. Use only new material with no reclaimed material incorporated in the finished bearing.

Provide elastomer for bearing pads meeting the requirements of AASHTO M 251 with durometer hardness of 60 on the Shore "A" scale. Provide elastomer compounds classified as Low-Temperature Zone D, Grade 4 or 5 meeting the requirements of AASHTO *LRFD Bridge Design Specifications*, Table 14.7.5.2-1, "Low-Temperature Zones and Minimum Grades of Elastomer".

Utilize cotton duck bearing pads (CDP) where MnDOT Bridge Details Part 1 B310 and B354 are included in the plans or when MnDOT Bridge Details Part 1 B311 or B355 utilize plain (non-steel reinforced) elastomeric bearing pads. Test and manufacture CDP in accordance with Military Specification MIL-C-882E. For CDP, waive additional sampling and testing requirements listed in this specification.

B.2 Properties

Test and accept sampled bearings in accordance with the following:

	Natural Polyisoprene (Natural Rubber)	Polychloroprene (Neoprene)
Durometer	60±5	60±5
Physical properties		
Hardness (ASTM D 2240)	60±5	60±5
Tensile strength (ASTM D 412)	2250 psi [15.5 MPa]	2250 psi [15.5 MPa]
Ultimate elongation (ASTM D 412), minimum	400%	400%
Heat resistance (ASTM D 573)	158°F [70°C]/168hrs	212°F [100°C]/70hrs
Temperature / Aging Time		
Hardness, maximum Shore "A" points change	+10	+15
Tensile strength, maximum percent change	-25%	-15%
Ultimate elongation, maximum percent change	-25%	-40%
Compression set (ASTM D 395, method B)		
22 hrs. at 158°F [70°C], maximum percent	25	N.A.
22 hrs. at 212°F [100°C], maximum percent	N.A.	35
Low Temperature Test (ASTM D 746, procedure B)	No Failure	No Failure
Brittleness at -54.4°F [-48°C]		
Laminated Pad Adhesion Test (ASTM D 429, method B)	40 psi [0.276 MPa]	40 psi [0.276 MPa]
Bond Strength (Peel Test)		

Compressive Strain of Laminated Bearings

Test each sampled laminated pad for compressive strain. The compressive strain in any layer of a laminated pad shall not exceed 9 percent at 1250 pounds per in² [8.62 MPa] average unit pressure for the full size laminated pad.

Proof Load Testing

Proof load each bearing pad per AASHTO M 251, Section 8.8.2. Use a compressive load of 1800 pounds per in² [12.41 MPa] for laminated pads and 1200 pounds per in² [8.27 MPa] for plain elastomeric pads. Reject bearing pads if bulging patterns imply laminate placement does not satisfy design criteria and manufacturing tolerances, or if bulging suggests inadequate laminate bond. Also reject bearing pads if there are three separate surface cracks greater than $\frac{1}{16}$ in [1.5 mm] wide by $\frac{1}{16}$ in [1.5 mm] deep.

B.3 Metal Reinforcement

Provide mild steel plates at least $\frac{1}{8}$ in [3 mm] thick for use as metal reinforcement.

C Certification

Submit to the Engineer a manufacturer's Certificate of Compliance.

3741.3 SAMPLING AND TESTING

A Manufacturer Sampling and Testing

Sample and test in accordance with AASHTO M 251, Section 8 except as modified in this special provision. Destructive test finished laminated and plain bearing pads at a rate of two full size bearing pads per lot (produced from the same raw material utilizing the same processes and procedures). A lot shall not exceed 100 pads and is not limited to finished sizes or thickness. Destructive testing is defined as any test that renders the product not usable for its intended purpose.

Provide bearing pad test data and certification prior to shipping. Test results of samples must verify compliance to product specifications. Any bearing tested that does not meet the specifications will result in the rejection of the entire lot. When applicable, the supplier shall retain a copy of the passing test results for one year and supply the document with subsequent jobs.

The cost of all bearing pad testing is incidental to the bearing pads.