



Designation: ~~D2399–12 (Reapproved 2017)~~^{ε1} D2399 – 21

Standard Practice for Selection of Cutback Asphalts¹

This standard is issued under the fixed designation D2399; 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.

^{ε1} NOTE—Section 1 was updated editorially in October 2017.

1. Scope

1.1 This practice covers the selection of cutback asphalts of the slow, medium, and rapid curing types for various paving and allied uses. Slow-curing cutback asphalts are also called road oils.

1.2 The values stated in either SI units or English units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.3 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.

1.4 *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

~~D2026~~D2026/D2026M Specification for Cutback Asphalt (Slow-Curing Type)

~~D2027~~D2027/D2027M Specification for Cutback Asphalt (Medium-Curing Type)

~~D2028~~D2028/D2028M Specification for Cutback Asphalt (Rapid-Curing Type)

3. Terminology

3.1 Definitions:

~~3.1.1 bitumen-aggregate applications—the spraying of liquid bitumen on prepared aggregate or pavement surfaces, which subsequently are covered with graded aggregate.~~

¹ This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.40 on Asphalt Specifications.

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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.

3.1.2 *bitumen-aggregate mixture*—a combination of bituminous material and aggregate that is physically mixed by mechanical and thermal means, spread on the job site, and compacted.

3.1.3 *bitumen applications*—the uses of sprayed bituminous coatings not involving the use of aggregates. Uses of liquid bitumen in this group are all classed as treatments. (See *surface treatments*.)

3.1.4 *cold-laid plant mix*—a mixture of liquid bitumen and mineral aggregate prepared in a central bituminous mixing plant and spread and compacted at the job site when the mixture is at or near ambient temperature.

3.1.5 *dense-graded aggregate*—aggregate that is graded from the maximum size down to filler with the object of obtaining a bituminous mix with a controlled void content and high stability.

3.1.6 *dust binder*—a light application of bituminous material for the express purpose of laying and bonding loose dust.

3.1.7 *mixed-in-place (road mix)*—a bituminous course produced by mixing mineral aggregate and liquid bitumen at the job site by means of travel plants, motor graders, drags, or special road-mixing equipment. Pavement base and surfaces, mixed in place, may utilize open-graded aggregates (3.1.10), dense-graded aggregates (3.1.5), sand (3.1.15), or sandy soil (3.1.17).

3.1.8 *mulch treatment*—a spray application of bituminous material used to temporarily stabilize a recently seeded area. The bitumen can also be applied to straw or hay mulch as a tie-down.

3.1.9 *multiple surface treatment*—two or more surface treatments placed one on the other. The maximum aggregate size of each successive treatment is usually one-half that of the previous one, and the total thickness is about the same as the nominal maximum size aggregate particles of the first course.

3.1.10 *open-graded aggregate*—one containing little or no mineral filler and in which the void spaces in the compacted aggregate are relatively large.

3.1.11 *patch mix*—a mixture of bituminous material and mineral aggregate for patching holes, depressions, and distressed areas in existing pavements. These mixes are suitable for use in relatively small areas, applied at ambient temperature using hand-laying and hand-compaction techniques. These mixes may be designed for immediate use or for stockpiling for a period of time prior to use.

3.1.12 *pavement base and surfaces*—the lower or underlying pavement course atop the subbase or subgrade and the top or wearing course. Cold-laid mixtures that are bound together with liquid bitumens use either open or dense aggregate gradations.

3.1.13 *penetration macadam*—a pavement construction using essentially one-size coarse aggregate, which is penetrated in place by a heavy application of high-viscosity bituminous material. This application is followed by an application of a smaller size coarse aggregate (to reduce the void space) then is rolled thoroughly. This procedure is usually followed another time with a still smaller coarse aggregate and roller compaction.

3.1.14 *prime coat*—an application of a low-viscosity bituminous material to an absorptive surface, designed to penetrate, bond, and stabilize the existing surface and to promote adhesion between it and the construction course that follows.

3.1.15 *sand*—a clean, mineral aggregate material passing a No. 4 (4.75-mm) sieve, but only about 5 % passing the No. 200 (75- μ m) sieve.

3.1.16 *sand seal*—a thin layer of spray-applied bitumen uniformly covered with sand (see 3.1.15), which waterproofs and improves the texture of a pavement surface.

3.1.17 *sandy soil*—a material consisting essentially of fine aggregate particles smaller than No. 10 (2.00-mm) sieve and usually containing up to 20 % passing a No. 200 (75- μ m) sieve. This material usually exhibits plasticity characteristics.

3.1.18 *single-surface treatment*—a single application of bitumen to any kind of road surface followed immediately by a single layer of aggregate of as uniform a size as practicable. The thickness of the treatment is about the same as the nominal maximum size aggregate particles. A single-surface treatment is used as a wearing and waterproofing course.

3.1.19 *surface treatments*—applications of bituminous materials to any type of road or pavement surface that produce an increase in thickness of less than 25mm (1 in.).

3.1.20 *tack coat*—an application of bituminous material applied to an existing, relatively nonabsorbent surface to provide a thorough bond between old and new surfacing.

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