



Standard Practice for Classifying Hot-Mix Recycling Agents¹

This standard is issued under the fixed designation D 4552; 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 practice covers a standardized method whereby petroleum product additives to be used in hot recycling of asphalt concrete can be identified. The products are classified by viscosity in centistokes measured at 140°F (60°C). This practice does not apply to emulsified materials.

1.2 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 70 Test Method for Specific Gravity and Density of Semi-Solid Bituminous Materials²

D 92 Test Method for Flash and Fire Points by Cleveland Open Cup³

D 140 Practice for Sampling Bituminous Materials²

D 946 Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction²

D 1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method³

D 1754 Test Method for Effect of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)²

D 2007 Test Method for Characteristic Groups in Rubber Extender and Processing Oils by the Clay Gel Adsorption Chromatographic Method⁴

D 2170 Test Method for Kinematic Viscosity of Asphalts (Bitumens)²

D 2171 Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer²

D 2872 Test Method for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)²

D 3381 Specification for Viscosity-Graded Asphalt Cement

for Use in Pavement Construction²

3. Significance and Use

3.1 Recycling of deteriorated asphalt pavements is being used with increasing frequency for its economy and benefit of conserving raw materials. The objective of recycling is to reuse the two ingredients of asphalt concrete—aggregate and asphalt and to restore the desired properties to the mixture. Recycling is carried out hot or cold, depending on the condition of the deteriorated pavement, construction procedure, availability of equipment, and cost. This practice is for classifying recycling agents to be used in hot recycling.

4. Classification

4.1 This practice describes recycling agents (RA) as belonging to one of the following six groups: RA 1, RA 5, RA 25, RA 75, RA 250, or RA 500, as shown in Table 1. The viscosity ranges are designed to avoid overlap and to provide sufficient flexibility to satisfy a wide range of mix proportions. Other properties specified include flash point (handling), weight percent of saturates (compatibility), selected properties of the RTF or TF oven residue (durability), and specific gravity.

4.2 The choice of RA grade will depend on the amount and hardness of the asphalt in the aged pavement. In general, the lower viscosity RA types can be used to restore aged asphalts of high viscosity and vice versa. Additionally, grades RA 1, RA 5, RA 25, and RA 75 will generally be most appropriate for hot-mix recycling of salvaged asphalt concrete when no more than 30 % virgin aggregate is added, while grades RA 250 and RA 500 will generally be most appropriate when more than 30 % virgin aggregate is incorporated into the mix.

5. Physical Properties

5.1 All recycling agents must be homogeneous, free-flowing at pumping temperature, and must conform to the requirements shown in Table 1.

5.2 The final acceptance of recycling agents meeting the requirements shown in Table 1 is subject to the compliance of the reconstituted asphalt blends with current asphalt specifications.

6. Sampling

6.1 All sampling shall be carried out in accordance with Practice D 140.

¹ This practice is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.40 on Asphalt Specifications.

Current edition approved Feb. 15, 1992. Published May 1992. Originally published as D 4552 – 86. Last previous edition D 4552 – 86.

² *Annual Book of ASTM Standards*, Vol 04.03.

³ *Annual Book of ASTM Standards*, Vol 05.01.