

1 **NORA Specification for Vacuum Tower Asphalt Extender**
2 **(VTAE) for Use in Pavement Construction¹**

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5 **1. Scope**

6 1.1 This specification covers Vacuum Tower Asphalt Extender that is used in the production
7 of asphalt cement for Pavement Construction.

8 1.2 *Units* - The values stated in either SI units or inch-pound units are to be regarded
9 separately as standard. The values stated in each system may not be exact equivalents; therefore,
10 each system shall be used independently of the other. Combining values from the two systems
11 may result in non-conformance with the standard.

12 1.3 *This standard does not purport to address all of the safety concerns, if any, associated*
13 *with its use. It is the responsibility of the user of this standard to establish appropriate safety and*
14 *health practices and determine the applicability of regulatory limitations prior to use.*

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16 **2. Referenced Documents**

17 2.1 ASTM Standards:²

18 ASTM D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester

19 ASTM D2042 Test Method for Solubility of Asphalt Materials in Trichloroethylene

¹ This specification is under the jurisdiction of NORA, An Association of Responsible Recyclers.

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.

20 ASTM D2872 Standard Test Method for Effect of Heat and Air on a Moving Film of Asphalt
21 (Rolling Thin-Film Oven Test)

22 ASTM D4402 Standard Test Method for Viscosity Determination of Asphalt at Elevated
23 Temperatures Using a Rotational Viscometer

24 ASTM D140 Standard Practice for Sampling Bituminous Materials

25 **3. Manufacture**

26 3.1 VTAE is the product of processing used oil using atmospheric distillation followed by
27 vacuum distillation to produce a vacuum residuum meeting the specifications outlined in table 1.

28 **4. Physical Requirements**

29 4.1 The VTAE shall be homogenous, free from water, and not foam when heated to 177°C
30 [350° F].

31 4.2 The VTAE shall conform to the requirements given in Table 1.

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33 **5. Methods of Sampling and Testing**

34 5.1 Sample and test the VTAE in accordance with the following methods:

35 5.1.1 *Sampling* – Practice D140

36 5.1.2 *Water* – Test Method D95

37 5.1.3 *Flash Point, Cleveland Open Cup* – Test Method D92

38 5.1.4 *Rolling Thin Film Oven Test* – Test Method D2872

39 5.1.5 *Solubility in Trichloroethylene* – Test Method D2042

40 5.1.6 *Viscosity at 60°C [140°F]* – Test Method D440

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42 **6. Keywords**

43 6.1 asphalt cement, pavement, vacuum tower, asphalt extender

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Table 1 Requirement for VTAE

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Test	
Flash Point, Cleveland Open Cup, min, °C [°F]	>232° [450]
Mass Change, RTFOT, %w/w max	1.0
Solubility in Trichloroethylene, min, %	98.0 ^A
Viscosity, 60°C [140°F], max, cP	5000

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^A Solubility of less than 98.0% is acceptable provided the final asphalt blended product meets the solubility requirements in the specifications

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