REOB/VTAE TF Update

Binder ETG Mtg

Apr 28th , 2016

Task Force and Document

- **Task Force**
  - 18 month effort
  - 19 individuals from member companies, AI staff & a FHWA liaison
- **Document: *"State-of-the-Knowledge: The Use of REOB/VTAE in Asphalt"***
  - approved by AI's Technical Advisory Committee and HS&E Committee, Apr 12-13
  - 6 sections, 60 pages of discussion (plus 42-page appendix that provides summary of each of the 26 published papers)
  - Designed to provide an objective and thorough review of all available information
  - Included extensive review process
  - Becomes AI's official guidance / position on REOB

Key Elements of Document

1) General Overview & Intent of Educational Document

- Carefully defines REOB/VTAE as the non-distillable residuum from a vacuum tower in a used oil re-refinery

2) REOB / VTAE Production Overview

- Description of re-refining process from collection of used oils to REOB/VTAE production

3) Literature Review of REOB / VTAE Use and Performance in Asphalt Industry

- Review of 26 published papers pertaining to REOB/VTAE (published prior to Jan 1, 2016)

Key Elements of Document

4) HSE Aspects

- Data provided demonstrating the re-refining process removes carcinogens present in the unrefined used oils
- Leaching studies show no differences between REOB/VTAE modified asphalts & unmodified asphalts
- Data shows similar fume composition for unmodified asphalt and REOB/VTAE modified asphalts

5) Discussion of Alternate Tests & Aging Protocols

- Recommend ΔTc after 40 hours of PAV be explored as an improved method for characterizing long-term binder embrittlement
- Assist with formulation & forensic analysis, but not to be used as a purchase specification

6) FAQs by Agencies and the Answers

- Provides answers to 21 frequently asked questions

Publishing of Document

- **Expected to be released by end of May 2016**

- **Available as free download on AI's website, with hardcopies available for a minimal price**

Repository of REOB Info

- http://www.asphaltinstitute.org/re-refined-engine-oil-bottom/
- 26 published papers
  - Linked to published journal
  - Currently through Dec 2015
- 30+ presentations at recent FHWA Expert Task Group (ETG) meetings and other industry meetings
  - Download directly

Asphalt Institute, Engineering, REOB Info

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Re-refined Engine Oil Bottom

The Asphalt Institute's Technical Advisory Committee has formed a task force on re-refined engine oil bottoms (REOB), also known as Vacuum Tower Asphalt Extender (VTAE). The objectives of this REOB task force are to:

- Learn more about REOB/VTAE materials, processing, effects/benefits when blended in asphalt and best practices.
- Recommend a course of action for Asphalt Institute that could include sponsoring a symposium, conducting research and/or developing information and guidance on REOB modification that may be similar to IS-220 for PPA modification.

Toward those objectives, the task force has developed this repository of REOB/VTAE information and wanted to share it with industry.

Members:

As an Asphalt Institute member you may submit Technical Question to AI Engineering Staff
You may also view all of the Asphalt Institute Regional Engineer Quarterly Reports

Re-refined Engine Oil Bottom Residue Information:

Published Papers

TITLE	AUTHOR(S)	PUBLICATION DATE
Use of Re-refined Oil Distillation Bottoms As Extenders For Roading Bitumens	P.R. Herrington	Journal of Materials Science – Vol. 27 No. 24 – December 1992
Waste Oil Distillation Bottoms As Bitumen Extenders	P.R. Herrington, V.K. Dravitzki, C.W.B. Wood, and J.E. Patrick	Road & Transport Research – Vol. 2 No. 4 – December 1993
Asphalt modification with used lubricating oil	Aaron Villanueva, Susanna Ho, and Ludo Zanzotto	Can. J. Civ. Eng. Vol. 35, 2008
Five Year Performance Review of a Northern Ontario Pavement Trial: Validation of Ontario's Double-Edge-Notched Tension Test (DENT) and Extended Bending Beam Rheometer (BBR) Test Methods	S.A.M Hesp, S.N. Genin, D. Scafe, H.F. Shurvell and S. Subramani	CTAA – 2009
Asphalt Cement Loss Tangent as Surrogate Performance Indicator for Control of Thermal Cracking	Abdolrasoul Soleimani, Shanan Walsh, and Simon A. M. Hesp	Transportation Research Record: Journal of the Transportation Research Board, No. 2126; 2009
Characteristics of Rejuvenated Bitumen With Used Lubricating Oil As Rejuvenating Agent	Kemas A. Zamhari, Madi Hermadi, Choy Wai Fun	International Conference On Sustainable Infrastructure and Built Environment in Developing Countries – November 2009 –

Questions?

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