

NAVISTAR, INC.		
CEMS (CORPORATE ENGINEERING MATERIAL SPECIFICATION)		NUMBER: CEMS BT-25
TITLE: Fuel Stability Test		CURRENT ISSUE DATE: August 2009
WRITTEN/REVIEWED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES ISSUE OF: October 2001
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<i>This specification may involve hazardous materials, equipment, and procedures. This specification does not purport to address all of the safety issues associated with its use. The user is responsible to consult appropriate safety and health practices and to determine the applicability of regulatory limits prior to use.</i>		
Change Notice: Replaced "International Truck and Engine Corporation" with "Navistar, Inc." per corporate directive.		

1.0 SCOPE

This method covers a test procedure for determining stability of distillate fuels and additives used therein.

2.0 APPARATUS

- 2.1 Oven or bath capable of maintaining a temperature of $212 \pm 2^{\circ}\text{F}$ ($100 \pm 1^{\circ}\text{C}$).
- 2.2 Analytical balance with a sensitivity of 0.1 milligram.
- 2.3 Nylon or stainless steel forceps.
- 2.4 100 milliliter graduated cylinder.
- 2.5 Pipette or syringe capable of delivering 0.2 milliliter.
- 2.6 Mechanical paint shaker, Red Devil No. 30 or equivalent.
- 2.7 Test tube with screw cap having Teflon liner, 25 x 150 millimeters. (Kimble No. 45066-A or equivalent - Extra cap, Kimble No. 45066-C, 24-410).
- 2.8 Support to hold test tube in a vertical position in oven or bath.
- 2.9 Glass or stainless steel hooks.

3.0 MATERIAL

- 3.1 Steel test specimen per figure on page 3.
- 3.2 Alundum, 90 mesh
- 3.3 Soft, lintless cleansing tissue or wiper.
- 3.4 Cotton, nonabsorbent.
- 3.5 No. 212 Eberhard Faber Eraser
- 3.6 4 ounce (120 milliliter) bottle.
- 3.7 Toluene, ACS.
- 3.8 Isopropanol, ACS.
- 3.9 Distilled water.
- 3.10 Plastic or rubber gloves.

4.0 PROCEDURE

- 4.1 Prepare the steel specimen in duplicate as follows:

Clean the metal specimen by first washing in toluene at approximately 135°F (57°C), and then

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isopropanol at approximately 120°F (49°C). Rub all surfaces with 90 mesh alundum contained on a ball of cotton moistened with toluene. Use enough pressure to remove all visible surface imperfections. Rewash the specimen as before and wipe with a cleansing tissue. For the final rinse, wash in isopropanol at approximately 120°F (49°C), handling the specimen with forceps, and hang from glass or stainless steel hooks until cool and dry.

- 4.2** Weigh the specimen to the nearest 0.1 milligram and place in the test tube. Record as Weight No. 1.
- 4.3** Place 100 milliliters of the test fluid and 0.2 milliliters distilled water into a 4 ounce (120 milliliter) bottle, and shake on the paint shaker for 5 minutes.
- 4.4** Immediately transfer 30 milliliters of the mixture prepared in step **4.3** to the test tube containing the weighed specimen. Cap the tube securely and place vertically in the oven or bath maintained at 212 ° ± 2°F (100° ± 1°C) for 4 hours.
- 4.5** Remove the tube from oven or bath and allow to cool to room temperature.
- 4.6** Remove the specimen and hang from a hook. Direct a gentle stream of toluene followed by isopropanol at ambient temperature against the specimen to remove the fluid mixture. Be careful not to wash away any deposits. Allow to hang until dry. Note any deposit or film on specimen.
- 4.7** Weigh the specimen to the nearest 0.1 milligram and record as Weight No. 2.
- 4.8** Remove any adhering deposit by rubbing with a pad of cotton soaked in a warm, (approximately 120°F (49°C), 50/50 mixture of toluene and isopropanol.
- 4.9** Remove any adhering film by rubbing the specimen lightly with a No. 212 Eberhard Faber Eraser (include all edges).
- 4.10** Wash the specimen in fresh toluene at approximately 135°F (57°C), and wipe with cleansing tissue. Finally, rinse with isopropanol and hang from a glass or stainless steel hook until dry and cool.
- 4.11** Weigh the specimen to the nearest 0.1 milligram and record as Weight No. 3.

5.0 REPORT

Report the following information:

- 5.1** Appearance of residue, if any, on steel specimen.
- 5.2** Weight loss of steel specimen in milligrams (Weight No. 1 minus Weight No. 3).
- 5.3** Weight of residue on steel specimen in milligrams (Weight No 2 minus Weight No. 3).

The report will be the average of duplicate tests.

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