

NAVISTAR, INC.		
CEMS (CORPORATE ENGINEERING MATERIAL SPECIFICATION)		NUMBER: CEMS BT-47
TITLE: Stability Test For Distillate Fuel		CURRENT ISSUE DATE: August 2009
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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 procedure to determine stability of distillate fuels under accelerated oxidizing conditions.

2.0 APPARATUS

- 2.1 A bath capable of maintaining the test temperature within $\pm 2^{\circ}\text{F}$ (1°C).
- 2.2 Analytical balance with a sensitivity of 0.1 mg.
- 2.3 Test cell - Pyrex glass test tube, 38 x 300 mm with $\frac{3}{4}$ standard female ground joint.
- 2.4 Condenser - Allihn type, Pyrex glass, 300 mm jacket with $\frac{3}{4}$ standard male ground joint to fit test cell.
- 2.5 Air tube - Pyrex, H.S. Martin M-23640-EC, or equivalent (see Figure 1).
- 2.6 Ring rod - (see Figure 2).
- 2.7 Plastic or stainless steel forceps.
- 2.8 Flowmeter capable of measuring 50 ± 5 ml of clean, dry air per minute.
- 2.9 Apparatus to measure color per ASTM D 1500.
- 2.10 Apparatus and materials to determine insoluble by filtration per ASTM D2276, Appendix A2.
- 2.11 Glass or stainless steel hooks.

3.0 MATERIAL

- 3.1 Copper, cold rolled sheet, deep drawing annealed, Alloy 110 per ASTM B 152, (CA 110 per SAE J463) or Type 110 per Navistar CEMS C-3. See Figure 3 for dimensions.
- 3.2 Flushing fluid, Petroleum Ether, 30 to 60°C .
- 3.3 Isopropyl alcohol, reagent grade.
- 3.4 Alundum, 90 mesh, RR Crystalline, Blue Label.
- 3.5 Rubber or plastic gloves.
- 3.6 Cleansing tissue, Kleenex or equivalent.
- 3.7 Cotton, absorbent non-sterile.

4.0 PROCEDURE

- 4.1 Measure and record color of test fluid as received per ASTM D 1500.
- 4.2 Clean two copper specimens (handle with gloves) using cotton moistened with isopropyl alcohol and dipped in alundum. Use enough pressure to remove all surface imperfections or films which

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may be present. Handle the specimens with plastic or stainless steel forceps and rinse with isopropyl alcohol. Allow the specimens to dry on glass or stainless steel hooks. Wipe both sides of the specimens with tissue to remove any grains of alundum which may be adhering to the surface.

- 4.3 Assemble the ring rod on the air tube and place the copper specimens on the ring rod hooks opposite of each other, see Figure 4. Place the air tube assembly into the test cell.
- 4.4 Add 125 ml of the test fluid to the test cell. Install the condenser and place the test assembly in the bath maintained at the test temperature in such a manner that the top of the fluid in the test cell is at least 25 mm below the surface of the heating medium, (see Figure 5.) Start clean, dry air through the cell and adjust the flow rate to 50 ± 5 ml per minute. Start flow of water through the condenser.
- 4.5 At the end of the test period, shut off the air and water and remove the test assembly from the bath. Remove the specimens and allow the test fluid to stand at room temperature for one hour.
- 4.6 Filter and collect all the fluid from the test cell using a vacuum of 10 ± 0.5 in. (255 ± 15 mm) of mercury per ASTM D 2276, Appendix A-2. Remove the filtrate for color determination. Then wash the residue in the test cell on to the filter membrane with four 50 ml portions of petroleum ether. Proceed with ASTM D 2276 Section A2.8.3.4. Weigh the amount of sediment to the nearest milligram and visually determine, then record the color of the sediment.
- 4.7 Measure and record the color of the filtered test fluid per ASTM D 1500.

5.0 REPORT

- 5.1 Color of test fluid per ASTM D 1500, before and after test.
- 5.2 Weight in milligrams of sediment collected on membrane filter disc.
- 5.3 Color of sediment on membrane filter disc; tan, grey, brown, black, etc.

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