DETERMINATION OF DEPOSITS FROM COOLANT/HOSE/POLYMER INTERACTION

Application

This procedure is used to test the level of deposits and staining potential of products formed by extraction and reaction of hose material with engine coolant.

Apparatus Required

Heating Apparatus

Heating mantle or hot plate capable of maintaining the test coolant at reflux boiling temperature (approximately 104 °C).

Glassware

500 cm^3 flask and condenser capable of refluxing 300 cm^3 of test coolant. The flask is connected to the condenser with an expansion adapter capable of holding a small piece of degas bottle material (approximately 1 to 2 cm^2) in the vapor phase.

Balance

Analytical balance capable of weighing to four decimal places.

Filter

11 cm diameter glass microfibre filter with 1.3 to 1.7 micrometer particle retention. Whatman GF/A or similar.

Filtration Apparatus

11 cm Buechner funnel, 1 liter filtration flask and vacuum source.

Colorimeter Testing Instrument

SAE J1545, Instrument capable of measuring CIElab color space, Illuminant D65, 10^o Standard Observer.

Materials Required

Test Coolant

150 cm^3 of specified coolant concentrate mixed with 150 cm^3 distilled (or deionized/ demineralized) water.

Hose Material

30 g (approximately) of specified hose inner wall material cut into small (approximately 1 cm^2) pieces.

Date	Action	Revisions	Rev 02
2011 11 07	Revised	Added delta E measurement	G. Kowalski, FNA
2001 08 14	Revised	Editorial – no technical change	A. Cockman
1994 09 26			

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Degas Bottle Material

A flat 1 to 2 cm^2 of specified degas bottle material, two pieces are required.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Place the hose pieces and test coolant in the flask.

2. Place one piece of the degas bottle material in the expansion adapter and retain the other piece as a control.

3. Assemble apparatus and heat to give lowest possible reflux.

4. Reflux for five hundred hours. Any surface bloom may not be removed from the hose material. At no point must the prepared coolant be vigorously boiled as some formulations can undergo irreversible degradation which may lead to artificially high levels of deposit.

5. Tare filter at 120 °C for one hour, cooling and storing in a desiccator.

6. Allow flask and contents to cool to 23 +/- 2 °C.

7. Vacuum filter the flask contents. Retain the hose material in the flask and rinse with several small aliquots of cold water until all insoluble material is removed. The washings are also filtered. Give the filter a final wash with cold water.

8. Dry the filter at 120 °C for one hour, cool in a desiccator and weigh back.

9. Calculate any retained material as a percentage of the initial hose weight and report as % deposit. Report filter type and particle retention.

10. Compare the degas bottle material with the retained control and report any visible changes.

11. Measure and report the CIElab color change in delta E of the degas bottle material.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.

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