Ford Motor Company

FORD LABORATORY TEST METHOD EU-AZ 053-01

PYROLYTIC GAS CHROMATOGRAPHIC ANAYLSIS OF FRICTION MATERIALS

Application

This procedure provides a characteristic quantitative chromatogram of the pyrolysis products from a friction material and shall also be used to establish the specification limited for the reference sample of a given formulation.

Apparatus

Dual Flame Gas Chromatograph Hewlett Packard 5750 Series

Strip Chart Recorder

200 - 250 mm chart width with a sensitivity of 1 - 2 mV full scale.

Chromatographic Columns

1.829 m x 3.175 mm stainless steel, packed with 10 % silicone gum rubber on 80 - 100 mesh silsanised diatomaceous earth support. Alternative columns may be required for some analyses. The resolution of the column shall comply with the Appendix.

Electronic Integrator

Infotronics CRS.100

Pyrolysis Equipment

Model 80 - Pyrolysis unit manufactured by Hewlett Packard Ltd. A 0 – 3 volt A.C. voltmeter with input impedance of 10 ohms or more must be conducted across the output cable.

Compressed Gases

Hydrogen - Electrolytic grade.
Air - Prepurified air.
Carrier gas - High purity inert gas.

Where equipment is no longer available, alternative units are permissible provided the equipment does not substantially alter the requirements in the Materials Specification and that prior Materials Engineering approval is obtained.

Date	Action	Revisions
2001 01 31	Revised	Editorial – no technical change A. Cockman
1994 02 28		

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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

A thorough description of the chromatograph and pyrolysis unit and their operation is given in the instruction manuals for the instruments. The operator must familiarize himself with the contents of these manuals.

From a transverse section of the sample filed to approx 45°, an homogeneous powder sample is abraded from the surface.

Introduce the tip of the probe into the powdered sample such that the sample is retained in the apex of the tip. Remove residual material on exterior of the probe.

Perform test run with operating conditions as follows:

1. Injection port temperature 250 °C
2. Detector temperature 25 °C above final column temperature.
3. Post injection interval 0 minutes.
4. Upper limit interval: 20 minutes or until column is clear, whichever is longer.
5. Starting column temperature 50 °C
6. Final column temperature 230 °C unless stated otherwise in the Material Specification.
7. Temperature programme rate: 4 °C/min unless stated otherwise in the Material Specification.
8. Chart speed 10.0 mm/min nominal.
9. Integrator settings shall be optimised for the analysis.
10. Pyrolysis conditions are 1200 °C for 12 seconds (alternative equipment may require different conditions).

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