

Motor Vehicle Fire Research Institute

Awarded Contracts

Title: Fire Testing of Under Hood Insulating Materials

Contractor: Biokinetics and Associates Ltd. – Mr. Ed Fournier,

Duration: May 24, 2005 – September 1, 2005

Purpose:

Research conducted for the Motor Vehicle Fire Research Institute has identified the use of under hood insulation as a potential fire preventative feature. The premise is that heat from an under hood fire would melt the mounting hardware supporting the under hood insulation allowing it to descend onto the engine and smother the fire.

The Automotive Fuel System Inspection database has identified the presence of such insulation in 74 of the 89 inspected vehicles. However, their fire retardant properties could not be ascertained by visual inspection alone. This project will conduct fire resistance tests on coupons cut from sample insulating liners be tested to assess their fire retarding properties. The mounting hardware used to affix the liners to the under side of the hood will also be tested.

Work Statement:

Initially, the insulation found in 6 of the 8 pickup trucks whose design histories were reviewed in Biokinetics report R04-02 V02 will be tested. Additional, samples from 6 SUVs, 6 passenger cars and 2 vans will be tested bringing the total number of tests to 20. The mounting hardware for the under hood insulation from three different manufacturers will also be tested.

The proposed tests include:

Cone calorimeter tests of 10cm x 10cm material coupons will be performed according to ASTM E1354¹. This test determines the ignitability, heat release rates, mass loss rates, effective heat of combustion and visible smoke development of materials. Three specimens of material are typically required for each test. However, to reduce testing costs only one sample of each will be tested as an initial screening of the test samples. A few repeat tests will be budgeted for confirmation of specific results, if needed. This testing will be conducted at the National Research Council Fire Lab.

The mounting hardware for each under hood insulation sample will also be tested. The test procedure will be as follows: A sample mounting lug will be placed in an oven from which a small mass will be suspended via a coupon of insulation. The total suspended mass will be equivalent to the hood liner mass divided by the number of mounting points used in its installation. The oven temperature will be increased to see if the lug material will melt or deform sufficiently, for the insulation sample to drop. This testing will be conducted in Biokinetics lab.

A report will be prepared summarizing the results of all the testing.

Deliverables:

A final report will be provided in Word format. All test data will be provided in Excel format. Reports and data will be provided electronic format.

¹ ASTM E 1354, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter.