

HHA-102 RMA report

Final Report - Evaporative Emissions Sampling of Whole Tires Test Project

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Submitted to the
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1400 K Street, NW
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June, 2001

ABSTRACT:

In response to customer inquiries, Rubber Manufacturers Association (RMA) member companies recognized the need for a coordinated and systematic study of tire evaporative emissions and test methods, and agreed to sponsor a test project. Six tire manufacturers participated. The project was approved during the summer of 1999, and the test tires were manufactured during October and November 1999. Initial emission measurements were made during January and February 2000. Final measurements were made September 2000 through February 2001.

The purposes of the project were to develop technical information regarding “stabilized” tire evaporative emissions under California test conditions; establish an “accelerated aging” protocol for quickly aging tires for testing; and evaluate use of the whole vehicle SHED for tire testing. Selection of an appropriate measurement technique offered challenges. The availability of VT-SHEDs and the direct applicability of the data generated resulted in the selection of full-sized VT-SHEDs for this work.

RMA designed four test groups. Two tire sizes and service types were selected for testing. Groups 1 and 2 represent experimental procedures for the accelerated aging of tires. Group 3, “normally aged” tires, was designed to represent tires that have 10,000 road miles and are one year old. The Group 3 tires received 10,000 miles of tire wear in a two-week period and were stored for the remainder of one year from date of manufacture prior to emission testing. Group 4, “fleet tires,” was comprised of tires that had seen actual use in the field prior to testing. Group 4 tires were 6 months to 2 years old from the date of manufacture and had accumulated 6,500 to 21,900 miles of road wear. The Group 4 tire sizes and service types approximated those for tires in Groups 1, 2, and 3. All tire emission results reported in this final project report represent emissions from a set of 4 tires.

Corrections for “blank” VT-SHED background emissions are required to estimate component contributions to vehicle totals. Four to six weeks of convective heat aging at

158°F with adequate ventilation were found to produce emission levels equivalent to a small sample of similar in-use tires.