



Smithers Scientific Services, Inc.

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January 19, 1998

CUSTOMER: INOVEX AUTOMOTIVE INC.
7799 Leesburg Pike
Suite 900, North Tower
Falls Church, VA 22043

ATTENTION: Mark Farkhan
Smithers Job #9710-02480A

SUBJECT: TEST REPORT:
The above mentioned firm submitted one (1) sample for testing identified as "Ride-On Tire Sealant".

<p>TESTING: <u>CHEMICAL ANALYSIS:</u> Tested to US Postal Service FMB V-21-93</p> <ul style="list-style-type: none"> pH Value Stability Heat Stability Cold Stability Flammability Corrosion <p>Evaporative Curing</p>	<p><u>REQUIREMENTS</u></p> <p>8.8 ± 0.8, max. Homogeneous and not separate in container Shall not separate Shall not freeze Shall not exhibit flash Corrosion must exhibit weight loss of .025% or more to justify failure 1/4" wide dried strip shall wrap around 1/8" diameter mandrel without cracking or separation. Also it shall resist tearing when elongated to 20% of its original length.</p>
<p><u>PHYSICAL ANALYSIS</u> Tire Sealant Test Tire Sealant Puncture Test</p>	<p>No Out-of-Balance Condition No Loss of PSI</p>

RESULTS: CHEMICAL ANALYSIS:

pH Value The pH limits of the material shall be between 8.8 ± 0.8 when testing fresh tire sealant. The pH of the material was checked at 25°C (77°F) using Beckman Type "E" high pH glass electrode.

<u>Results</u>	<u>Pass/Fail</u>
8.16	Pass

Stability The tire sealant must be homogeneous and cannot separate in the container. The sealant must not require stirring or mixing to use.

<u>Results</u>	<u>Pass/Fail</u>
Homogeneous	Pass

Every precaution was taken to ensure the accuracy of this report. However, the information is provided subject to the condition that Smithers Scientific Services, Inc., will not be liable for any loss or damage resulting from the use of these data.

RESULTS: CHEMICAL ANALYSIS:

Heat Stability The tire sealant shall not separate after being exposed to temperatures up to $82 \pm 2^{\circ}\text{C}$ ($180 \pm 4^{\circ}\text{F}$), although a slight amount of clear liquid (less than 3% by volume) on top is allowed.

<u>Results</u> No Separation	<u>Pass/Fail</u> Pass
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Cold Stability The tire sealant shall not freeze at $-40 \pm 5^{\circ}\text{C}$ ($-40 \pm 9^{\circ}\text{F}$).

<u>Results</u> No freezing	<u>Pass/Fail</u> Pass
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Flammability The tire sealant, including chemical carriers or propellants, shall have no flash when tested up to and including the initial boiling point.

<u>Results</u> No flash	<u>Pass/Fail</u> Pass
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Corrosion The tire sealant shall not cause corrosion on material from common steel wheels or aluminum wheels. The corrosion must exhibit a weight loss of .025% or more to justify failure.

<u>Results</u> Steel and aluminum corrosion was less than .025%	<u>Pass/Fail</u> Pass
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Evaporative Wrap material around 1/8" diameter mandrel having greater than a 20% elongation.

<u>Results</u> No cracking or tearing shall be observed.	<u>Pass/Fail</u> Pass
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RESULTS: TIRE SEALANT BALANCE TEST

The radial tire used for this portion of the analysis was a P205/65R15 all season steel belted radial tire. This tire was match mounted prior to being mounted. Once mounted, the tire and rim were balanced with the use of a dynamic (spin) balancer. Once balanced, the "Ride-On Tire Sealant", (5 oz.), was added to the tire and rim assembly through the valve stem. The tire was then mounted to the test vehicle, (a 1993 Ford Taurus), and driven approximately 200 miles on both city streets and interstate. Upon completion of the 200 miles, the tire was removed from the test vehicle, rebalanced on the dynamic balancer and accelerated to a speed of 10 - 25 MPH. Once the tire had reached that speed, the balancer was immediately shut off. Upon completion of the re-balance, no indication of any out-of-balance condition was observed.

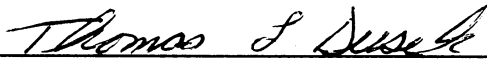
Pass/Fail Pass

TIRE SEALANT PUNCTURE TEST

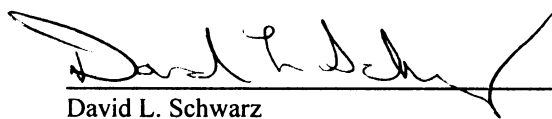
Test Objective: To simulate if the "RIDE-ON" tire sealant could plug a series of punctures which were deliberately initiated into the tread area of the tire, maintaining constant air pressure.

Test Procedure: The tire used for this simulation was a Dunlop Radial Truck Tire - 285/75 R24.5. This truck tire was mounted on a 24.5 X 8.25 steel rim, and injected with 32.5 oz. of "Ride On" tire sealant through the tire valve. After the sealant had been injected into the tire, the completed tire assembly was rotated 3 to 4 revolutions to uniformly disperse the tire sealant throughout the inside of the tire. Upon completion, the tire was inflated to 110.0 psi., and mounted on a road wheel machine, applying a static load of 6175 lbs. for 8 hours. (This static load was done in order to simulate a vehicle being parked overnight). After the 8 hour static load period was complete, the tire assembly was taken to a speed of 35 mph for 24 hours. After this 24 hour cycle, the tire inflation pressure was re-checked registering 124.0 psi. (The 14.0 psi. increase was due to the heat the tire had conducted while being rotated @ 35.0 mph for the 24 hr. period). Once the tire was examined for any visual defects, and the inflation pressure was checked, the tread area was deliberately punctured by using a device resembling a 16 penny nail, (an instrument with a 1/4" shaft diameter). This device was pounded completely through the tread and carcass area and removed causing a hole. Once the puncture was performed, the tire was taken back to a speed of 35 mph with the 6175 load being applied for another 24 hour cycle. The tire inflation pressure was taken at the end of the 24 hour cycle indicating 124.0 psi. This 24 hour cycle was followed by the 8 hour static cycle, again having the 6175 lb. load applied, and having the inflation pressure taken. This test cycle was continued for a total of 4 puncture tests and 4,200 total test miles. Upon the completion of each 24 hour road wheel test, followed by the 8 hour static load period, there was no indication of air loss or any visual defects found from the tire or assembly.

Pass/Fail Pass



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