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Test Methodology for Evaluating the Chemical Compatibility of Wheel Finishes with Various Chemicals		

RATIONALE

The technical report covers technology, products, or processes which are mature and not likely to change in the foreseeable future.

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1. SCOPE

This document proposes methods for the testing and evaluation of aluminum wheel and wheel trim surface finishes for compatibility with various types of tire, wheel and car wash cleaning materials, and other chemicals that might come into contact with these automotive components. It is recognized that each end user of this methodology might seek answers to questions that are unique to his business or situation. Therefore, the procedure is written in a generic sequence that could be strictly followed, repeated, or modified in order to provide the user with the best results. Example decision tree are provided to help the user select a sequence of exposure steps that would best suit his needs, (reference Figures 1, 2).

This procedure should not be utilized if the intent is to evaluate the compatibility of wheel finishes to any flammable products, because those chemistries would require special laboratory safety and handling precautions.

1.1 Purpose

The purpose is to standardize the process and methods for assessing the compatibility of chemicals with wheels and wheel trim used on passenger vehicles.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest version of SAE publications shall apply.

2.1.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J2633 Wheel and Wheel Trim Weathering Testing for Paint Coatings

2.1.2 ASTM Publications

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D1735 Standard Practice for Testing Water Resistance of Coatings Using Water Fog

ASTM D 1193 Standard Specification for Reagent Water

3. TEST PROCEDURE

3.1 Test Materials and Equipment

Various liquid tire, wheel, chrome, and whitewall cleaners, as well as other car wash solutions, that can be found in the geographic areas of interest. Various concentrations of ingredients could be evaluated with this procedure. Each test and each test cycle should be initiated with new chemical solutions.

3.1.1 Containers such as polyethylene bottles should be procured to hold the coated panels and the test solutions. These containers must be inert to acids, caustics and petroleum products that could be in the cleaning solutions. The operator should utilize the Material Safety Data Sheets, (MSDS) of each product to determine if the bottles selected for the test will be inert for the test procedure. Make sure that the containers will not be degraded by the solutions prior to container selection. Assure that the containers will be of adequate size to accommodate your test samples and solutions, and for your special handling needs.

3.1.2 While any geometry of sample could be utilized, the recommended sample configuration would be a wrought or cast aluminum or steel panel with the appropriate cleaning, pretreatment, and coating that would simulate production for that candidate finish. The baseline appearance, hardness, and other properties of the panel should be established prior to engaging in a matrix of testing. The baseline properties could be used to determine if there were changes as a result of being exposed to the solutions. Consult with the coating manufacturer to determine the baseline characteristics of the finish.

3.1.3 Finishes that are to be evaluated on the panels should be applied with production-intent cures and thicknesses. Studies could also include minimum and maximum cures and thicknesses. All new coatings should be evaluated in parallel with a currently approved production material, or with a "Dummy panel" with a finish that undergoes the cycles of time and temperature but in a neutral solution, such as water.

3.1.4 The chemistry of the cleaner media should be documented prior to initiation of the procedure to establish the baseline chemistry. The end-of-test cleaner could be compared to the baseline chemistry. Changes might indicate a breakdown in the panel finish.

3.2 Exposure

3.2.1 Document all production intent data relative to coating thickness, cure, and process conditions, finish quality, test media chemistry, etc. After the panels have been coated, allow 72 h 'age' before engaging in the next step of the procedure. This is common practice for painted panels to assure that the cross linking has proceeded to a normalized degree of cure.