



Standard Practice for Rubber IRM 901, IRM 902, and IRM 903 Replacement Oils for ASTM No. 1, ASTM No. 2, ASTM No. 3 Oils, and IRM 905 formerly ASTM No. 5 Oil¹

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INTRODUCTION

Test Method **D471** was revised in February 1995, establishing IRM 902 and IRM 903 as replacements for ASTM No. 2 and No. 3 immersion oils, respectively. Unlike ASTM No. 2 and No. 3 oils, the two IRM oils are severely hydrotreated, have a demonstrated negative Ames test and do not require cancer warning labels under the OSHA Hazard Communication Standard published in November 1983. Although it was attempted to match the effect of the ASTM oils on rubber properties in immersion testing as closely as possible, in general, neither of the IRM oils produces test results exactly identical to the ASTM oils it replaced.

Test Method **D471** was again revised in October 2006, establishing IRM 901 as a replacement for ASTM No. 1 immersion oil. The replacement was necessitated by the sudden unavailability of ASTM No. 1 oil. Comprehensive research and development was conducted to establish a suitable replacement. A Precision and Bias statement will be prepared in accordance with Practice **D4483** at the conclusion of a forthcoming interlaboratory test program and included in Test Method **D471**. Although an attempt was made to match the effect of the ASTM No. 1 oil on rubber properties in immersion testing as closely as possible, preliminary findings indicate that IRM 901 oil produces test results that are not identical to the ASTM oil it replaced. Please refer to Test Method **D471**, Table 1, for a description of the specific characteristics of IRM 901 and ASTM No. 1 oils.

The selections for replacement ASTM No. 2 and No. 3 oils were made on the basis of an objective comprehensive test program as described in this practice and decisions on the data generated in this program were made in open meetings of Subcommittee D11.15. The SAE Committee on Automotive Rubber Specifications (CARS) made a recommendation on the replacement oils that was identical to the decisions made by D11.15.

This practice addresses the need for establishing a correlation between test results obtained with IRM versus ASTM oils, based on results of the described test program. Although the test program was quite comprehensive, it cannot begin to address the numerous variations in compound recipes used in the rubber industry. Correlations established by this practice may therefore not always provide satisfactory results. In this case it is suggested that other approaches be used, such as a direct comparison of each specific rubber compound in the respective ASTM and IRM oils. All new specifications, including oil immersion testing, shall be established using IRM 901, IRM 902, and IRM 903 in place of ASTM No. 1, ASTM No. 2, and ASTM No. 3 oils, respectively.

1. Scope

1.1 This practice covers three immersion oils to be used as replacements for ASTM No. 1, No. 2, and No. 3 immersion oils

¹ This practice is under the jurisdiction of ASTM Committee **D11** on Rubber and is the direct responsibility of Subcommittee **D11.15** on Degradation Tests.

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as called for in Test Method **D471**. The immersion oils will be designated as IRM 901 as a replacement for ASTM No. 1 oil, IRM 902 as a replacement for ASTM No. 2 oil, and IRM 903 as a replacement for ASTM No. 3 oil. The new reference oils have been developed under a new Committee D11 policy on reference materials (see Practice **D4678** for background on the new policy and procedures).

1.2 The oils, IRM 901, IRM 902, and IRM 903, are similar but not fully equivalent to ASTM No.1, ASTM No. 2, and