



AEROSPACE RECOMMENDED PRACTICE

ARP7120™

Issued

2023-05

Compatibility of Turbine Lubricating Oils

RATIONALE

Any new lubricant used in a system must be compatible with any lubricant that is likely to have been used previously in that system. This SAE Aerospace Recommended Practice (ARP) looks specifically at fluid miscibility and particulate formation when mixing a candidate lubricant with specific reference lubricants.

1. SCOPE

This method is used for determining the compatibility of a candidate lubricant with specific reference lubricants. The reference lubricants to be used will typically be mandated by the owner of the product specification against which the candidate lubricant is being compared. This method is split into two procedures (Procedure A and Procedure B) with a summary of each procedure contained in Section 4.

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D1193 Standard Specification for Reagent Water

ASTM D2273 Standard Test Method for Trace Sediment in Lubricating Oils

2.2 ISO Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ISO 3696 Water for analytical laboratory use - Specification and test methods

2.3 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

FED-STD-791 Method 3403 Compatibility of Turbine Lubricating Oils

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<https://www.sae.org/standards/content/ARP7120/>

Documents

Document Sharing Hub

2.4 UK Government Publications

Copies of these documents are available online at <https://www.dstan.mod.uk/toolset/index.html>.

DEF STAN 05-50 (Part 61) Method 24 Assessment of the Compatibility of Mixtures of Gas Turbine Lubricating Oils

3. WARNING

This document may involve hazardous materials, operations, and equipment. This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

4. OUTLINE OF METHOD

4.1 This method initially consists of preparing mixtures of the candidate lubricant and reference lubricant(s) in three different proportions, then maintaining these mixtures at a fixed temperature for 7 days. After these 7 days, the procedures differ as follows:

4.1.1 Procedure A

After the 7-day period, the mixtures are stored in a dark environment at room temperature for a further 21 days then assessed visually before determination of solid particle contamination by gravimetric filtration.

4.1.2 Procedure B

After the 7-day period, the mixtures are centrifuged for 10-minute intervals until the volumes of sediment become constant.

5. APPARATUS

5.1 Oven capable of maintaining a temperature of $105\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$.

5.2 Conical flasks (three per reference lubricant), borosilicate glass, 250 mL capacity, with ground-glass stoppers.

5.3 Measuring cylinder(s), capable of measuring 20, 100, and 180 mL.

5.4 Apparatus Required for Procedure A Only

5.4.1 Cupboard or other environment that can remain in darkness and at room temperature ($24\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$) for 21 days.

5.4.2 Oven capable of maintaining a temperature of $90\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$.

5.4.3 Filtration equipment (e.g., filter holder and funnel, side-arm flask, and vacuum supply). Aluminum foil may be necessary to cover the filter funnel if the filtration is slow.

5.4.4 Petri dish.

5.4.5 Analytical balance, capable of measuring to a precision of 0.1 mg.

5.5 Apparatus Required for Procedure B Only

5.5.1 Centrifuge tubes, cone-shaped, 100 mL (refer to ASTM D2273).

5.5.2 Centrifuge, capable of spinning two or more centrifuge tubes, and applying a relative centrifugal force (rcf) of 600 to 700 at the tips of the tubes.

5.5.3 Water bath, capable of maintaining a temperature of $93\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.