

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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COMPOUND, CORROSION - PREVENTIVE (Aircraft Engine)

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1. **ACKNOWLEDGMENT:** A vendor must mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **TYPE:** (a) A compound consisting of a mixture of three volumes of aircraft engine lubricating oil to one volume of a corrosion inhibitive agent as an additive.

(b) When specified by the purchaser the corrosion inhibitive agent and lubricating oil may be purchased independently.
3. **USE:** This compound shall be suitable for the preservation of metal parts of aircraft engines during shipment and storage, and for lubricating the engine while operating as specified.
4. **REQUIREMENTS:** (a) The compound shall form a continuous, completely protective film on metals by any method of application, and shall be readily removed by spraying with kerosene or by the use of wiping cloths saturated with kerosene.

(b)

Viscosity, Saybolt Universal Seconds at 210°F	100 - 125
Viscosity Index (Dean & Davis)	95 min
Flash Point	350°F min
Pour Point	20°F max
Volatile Matter, by weight	5% max
Carbon Residue	2.5% max
Ash	1.5% max
Precipitation Number	0.1 max

(c) **Solubility:** The compound shall be completely soluble at 70° to 80°F in all percentages and in all grades of aircraft engine lubricating oil of 95 minimum viscosity index. An artificially aged sample of the compound shall show no separation within 24 hours when mixed with an equal volume of aircraft engine lubricating oil, as detailed in section 5 (c).

(d) **Protection:** A film of the compound shall protect low carbon steel panels for a minimum of 150 hours in a humidity cabinet with an atmosphere maintained at 120°F±5° and 95-100% R.H., as detailed in section 5 (d).

(e) **Hydrobromic Acid Neutralization:** The compound shall retard hydrobromic acid corrosion. This characteristic shall be determined as detailed in section 5 (e).

(f) **Effect on the Color-Indicating Properties of Cobalt Chloride Impregnated Silica-Gel:** The mixture shall show no adverse effect on the property of the cobalt chloride impregnation of silica-gel to indicate the relative humidity at any time, as detailed in section 5 (f).

(g) **Corrosiveness:** The compound shall not be corrosive to any metal nor have an adverse effect on any other substance used in the engine.

(h) Lubrication: The compound shall be capable of satisfactorily lubricating an aircraft engine for at least 30 minutes, operating at 50% power.

5. TESTS: (a) Methods: Unless otherwise specified, all tests shall be conducted in accordance with ASTM methods.

(b) Viscosity shall be determined after all volatile matter has been removed.

(c) Solubility: A quantity of compound sufficient to allow the recovery of 50 ml. after aging shall be placed in a flat bottomed container so that the film thickness does not exceed 3 mm. This dish shall be placed in an oven at $200^{\circ}\text{F}\pm 5^{\circ}$ for 24 hours. Following aging, 50 ml. of the compound shall be mixed thoroughly with 50 ml. of aircraft engine lubricating oil in a 100 ml. stoppered glass graduate. There shall be no separation after 24 hours.

(d) Protection: Two 2" x 4" sand blasted panels of low carbon steel, AMS 5042 or equivalent, shall be dipped in the compound so as to submerge completely all surfaces and shall then be suspended vertically in an atmosphere maintained at $77^{\circ}\text{F}\pm 5^{\circ}$ and 50-55% R.H. for four hours. At the end of this period the panels shall be suspended vertically in a humidity cabinet maintained at $120^{\circ}\text{F}\pm 5^{\circ}$ and 95-100% R.H. for one hundred and fifty hours under conditions of dynamic atmosphere. The air in the cabinet shall circulate at such a rate as to cause approximately one complete air change each twelve minutes. The panels shall then be removed from the cabinet, cleaned with naphtha and examined. Visible corrosion of either surface, except within 1/8" from any edge, shall be cause for rejection of the compound.

(e) Hydrobromic Acid Neutralization: Two 2" x 4" sand blasted panels of low carbon steel, AMS 5042 or equivalent, shall be dipped in a 10% emulsion of 0.2% hydrobromic acid solution in aircraft engine lubricating oil, and slushed vigorously for one minute. The panels shall be removed and allowed to drain for fifteen seconds. Each panel shall then be dipped in the corrosion preventive compound by five repeated immersions for 30 seconds. They shall then be suspended vertically in an atmosphere maintained at $77^{\circ}\text{F}\pm 5^{\circ}$ and 50-55% R.H. for four hours. Afterwards, the panels shall be hung vertically in a humidity cabinet maintained at $120^{\circ}\text{F}\pm 5^{\circ}$ and 95-100% R.H. for twenty-four hours. At the end of the period the panels shall be cleaned with naphtha and examined for corrosion. Pitting, corrosion, or other attack involving either surface, except within 1/8" from any edge shall be cause for rejection of the compound.

(f) Effect of the Compound on Color-Indicating Properties of Cobalt Chloride Impregnated Silica-Gel: An activated dehydrator plug, AS 7, shall be prepared for this test by drilling a 1/16" diameter hole in the solid end, and saturating with distilled water. All excess moisture shall be removed so that no droplets of water remain in the plug. Twenty, plus or minus one-tenth (20 ± 0.1), grams of the compound shall be weighed into a 125 ml. flask having a $\frac{3}{4}$ 24/40 ground glass neck. The prepared plug shall be fitted firmly in the neck of the flask, perforated end down, and sealed in place by applying collodion to the joint. The assembled flask shall then be placed in an oven maintained at $120^{\circ}\pm 5^{\circ}\text{F}$. After twenty-four hours, the plug shall be removed and examined. Any coloration of the dehydrating agent at the perforated end of the plug, other than that obtained with a plug similarly treated and tested with aircraft engine lubricating oil, shall be cause for rejection of the compound.