

AERONAUTICAL MATERIAL SPECIFICATION

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COMPOUND, CORROSION PREVENTIVE (Aircraft Engine)

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1. ACKNOWLEDGMENT: A vendor must mention this specification number in all quotations and when acknowledging purchase orders.
2. TYPE: (a) This specification is for a compound consisting of a mixture of aircraft engine lubricating oil and 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. QUALITY: 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.
5. REQUIREMENTS:
 - (a) Viscosity Seconds at 210°F (Saybolt Universal) 100-125
 - Viscosity Index (Dean & Davis) (min) 95 *
 - Pour Point °F (max) 20
 - Volatile Matter percent (by weight) (max) 5
 - Flash Point °F (min) 350
 - Carbon Residue percent (max) 2.5
 - Ash percent (max) 1.5
 - Precipitation Number percent (max) 0.1

(*NOTE: This requirement applicable unless otherwise specified by purchaser)

(b) Solubility: The compound shall be completely soluble in all percentages at 70° to 80°F 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 6 (c).

(c) Humidity: A film of the mixture shall protect low carbon steel panels for a minimum of 150 hours in a humidity cabinet with an atmosphere maintained at 120°F $\pm$ 5°F and 95-100% R.H., as detailed in section 6 (d).

(d) Hydrobromic Acid Neutralization: The compound shall retard hydrobromic acid corrosion. This characteristic shall be determined as detailed in section 6 (e).

(e) 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 6 (f).

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

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

6. 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°F 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) Humidity: Two 2" x 4" sand blasted panels of low carbon steel shall be dipped in the compound so as to completely submerge all surfaces and shall then be suspended vertically in an atmosphere maintained at 77°F + 5° 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°F + 5° 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 material.

(e) Hydrobromic Acid Neutralization: Two 2" x 4" sand blasted panels of low carbon steel 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 then be immediately immersed in the corrosion preventive compound and allowed to remain thirty seconds completely submerged. The panels shall then be hung vertically in a humidity cabinet maintained at 120°F + 5° and 95-100% R.H. 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 corrosion preventive compound.

(f) Effect of the Compound on Color Indicating Properties of Cobalt Chloride Impregnated Silica Gel: Two activated dehydrator plugs, AS 7, shall be used for this test. One plug shall be immersed in the compound maintained at 100°F until the contained silica gel is fully saturated with the mixture. The other plug shall be immersed in aircraft engine lubricating oil also maintained at 100°F and similarly saturated. Both plugs shall then be removed and placed in a vertical position permitting the excess oil to drain out of the perforated end. After one hour of drainage, both plugs shall be placed in an upright position, perforated ends up, and distilled water at room temperature shall be dropped into the gel in both plugs, one drop at a time, permitting the water to percolate into the gel. After filling, the plugs shall be undisturbed for 30 minutes. At the end of this period the gel in the two plugs shall be compared with respect to color. Differences in color, not attributable to