AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 3158

Issued 6-30-64
Revised

SOLUTION, FLUORESCENT PENETRANT
Water Base

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for use in fluorescent penetrant inspection of parts and assemblies for detection of surface discontinuities and imperfections, particularly on parts, such as those in liquid oxygen systems, which must not be exposed to oils.

3. COMPOSITION: Material shall be composed of suitable vehicles (including water), dyes, and additives necessary to provide a stable, non-corrosive, water soluble, highly penetrating fluorescent solution which may, but need not, be diluted with an appropriate amount of water for use.

4. TECHNICAL REQUIREMENTS: Material shall conform to the following requirements; tests shall be performed in accordance with the issue of listed ASTM methods specified in the latest issue of AMS 2350, insofar as practicable.

4.1 Physical Properties:

Color, max	6	ASTM D1500
Specific Gravity at 75/75 F (23.9/23.9 C)	1.040 - 1.050	
Viscosity, Kinematic at 100 F (37.8 C), Centistokes	11 - 14	ASTM D445
Flash Point, min	250 F (121.1 C)	ASTM D92
pH	8.0 - 9.5	

4.2 Color: Shall be predominantly green when examined by reflected white light, yellow by transmitted white light, and yellowish-green when examined under black light.

4.3 Toxicity: The product shall contain no materials of known toxicity. The vapor shall not cause discomfort or injury to persons using the product.

4.4 Water Solubility: The product shall be completely soluble in water in all proportions and, when diluted with water, shall form a clear yellow solution with no visible cloudiness. No scum or separate layer shall form on the surface or on the bottom.

4.5 Fluorescence: Shall be not less than 6 when tested as follows:

4.5.1 Test Apparatus:

Section 8.3 of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

SAENORM.COM : Click to view the full PDF of ams3158

Copyright 1964 by Society of Automotive Engineers, Inc.

Printed in U. S. A.

4.5.1.1 Viewer: A box-like device approximately 3.5 x 3.5 x 3 in., having 1 in. diameter viewing holes top and bottom. There shall be seven slots 0.375 in. apart, having access through one side of the box, to permit aligning 14 cobalt glass filters arranged singly or in pairs per slot between the viewing holes. The box shall be supported vertically over a suitable platform so that the lowest filter slot will be 8.5 in. from, and parallel to, the platform.

4.5.1.2 Cobalt Glass Filters: Shall be 1.5 x 1.5 x 0.125 inches. A mask having a 1 in. diameter hole shall be placed on or between the filters and so arranged as to permit alignment with the viewing holes in top and bottom of the viewer.

4.5.1.3 Ultraviolet Lamp: May be either fixed or portable type rated at 90 - 100 ft candles in the range of 3200 - 4000 Angstrom units.

4.5.1.4 Masking Paper: Black, matte finish, opaque paper as is used commonly for wrapping and spacing of photographic film.

4.5.2 Test Procedure: Place 1 drop of the fluorescent concentrate on a 1 in. square of the masking paper. Place the masking paper containing the solution on the platform below the viewer and align with the 1 in. diameter holes in the viewer. Locate the ultraviolet lamp 12 in. away from the drop of oil and focus light rays on the drop of solution. Insert filters in the viewer, starting at bottom slot nearest platform, until the fluorescent glow of the solution is masked out when viewed through top of viewer. The number of filters required to mask out the visible fluorescence of the solution sample shall be used as the basis for evaluation.

4.6 Impact Sensitivity: The solution, and the concentrate obtained by evaporating the solution in an oven at 220 F ± 2 (104.4 C ± 1.1) to 50% water content by volume, shall not be sensitive to impact when in contact with liquid oxygen and tested under hammer impact energy of 356 ft-lb per sq in. obtained by dropping a 20-lb weight onto a hammer having a diameter of 0.50 in. using a testing procedure acceptable to the purchaser. An equivalent alternate procedure may be used when agreed to by the purchaser.

5. REPORTS: Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests to determine conformance to the requirements of this specification. This report shall include the purchase order number, material specification number, batch number, manufacturer's name or trade mark, and quantity.

6. IDENTIFICATION: Containers shall be legibly marked to show this specification number, purchase order number, batch number, manufacturer's name and trade mark, and quantity.

7. APPROVAL:

7.1 To assure adequate performance characteristics, material shall be approved by purchaser before material for production use is supplied, unless such approval be waived. Results of tests on production material shall be essentially equivalent to those on the approved sample.

SAENORM.COM : Click to view the full PDF of ams3158