

# AEROSPACE MATERIAL SPECIFICATION



AMS 2484B

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Superseding AMS 2484A

## Blackening Solution for Steel Touch-Up Method

### 1. SCOPE:

This specification covers the requirements for an inorganic blackening solution for steel, applied at room temperature.

### 1.2 Application:

This blackening solution has been used typically for touch-up of black oxide surface finish in cases where the coating has been removed.

### 1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

### 2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order form a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

### 2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2485 Black Oxide Coating  
AMS 6350 Steel Sheet, Strip, and Plate, 0.95Cr - 0.20Mo (0.28 - 0.33C) (SAE 4130)

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<http://www.sae.org/technical/standards/AMS2484B>

## 2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM F 519 Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals

## 2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

FED-STD-1313 Material Safety Data Sheets, Preparation and Submission of

## 3. TECHNICAL REQUIREMENTS:

### 3.1 Composition:

Shall be optional with the manufacturer but shall yield a product conforming to the requirements of 3.2 when applied at room temperature.

### 3.2 Properties:

The blackening solution shall conform to the following requirements; test shall be performed on the product as supplied and in accordance with the specified test methods. Specimens for tests, if not specified, shall be prepared in accordance with 4.3.1.

3.2.1 Hydrogen Embrittlement: The coating shall not cause hydrogen embrittlement, determined in accordance with ASTM F 519 (Type 1) using notched round bars stressed in tension under constant load.

3.2.2 Intergranular Attack: Coated specimens shall not exhibit intergranular attack greater than 0.0001 inch (2.5  $\mu\text{m}$ ), determined on a cross-section at 500X magnification.

3.2.3 Blackening Ability: Solution shall form a coating that completely covers the steel surface providing a uniform, ebony-black coating on polished surfaces and a black or dark grey coating on nonpolished surfaces.

3.2.4 Dimensional Change: Solution when applied to steel surfaces shall not cause a measurable change in dimensions when measured with a micrometer having measuring accuracy of 0.0001 inch (2.5  $\mu\text{m}$ ).

3.2.5 Wipe Test: When coated specimens are wiped with a clean white cloth there shall be no indication of color on the cloth.

3.2.6 Blackening Solution: Shall not cause damage or degradation of existent black oxide coatings on steel specimens (See 4.3.1.1).

### 3.3 Quality:

The blackening solution as received by purchaser, shall be uniform in quality and condition and free from foreign materials and other contaminants detrimental to usage of the product.

## 4. QUALITY ASSURANCE PROVISIONS:

### 4.1 Responsibility for Inspection:

The vendor of the blackening solution shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the blackening solution conforms to the requirements of this specification.

### 4.2 Classification of Tests:

4.2.1 Blackening ability (3.2.3), wipe test (3.2.5), and quality (3.3) are acceptance tests and shall be performed on each lot of blackening solution.

4.2.2 Preproduction Tests: All technical requirements of this specification are preproduction tests and shall be performed prior to or on the initial shipment of blackening solution to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4, and when purchaser deems confirmatory testing to be required.

### 4.3 Sampling and Testing:

Sufficient blackening solution shall be taken at random from each lot to perform all required tests. A lot of solution shall be all blackening solution manufactured at one time from one group of raw materials and presented for vendor's inspection at one time.

4.3.1 Specimens for determining conformance to the requirements of 3.2 shall be AMS 6350 or similar steel, 0.040 x 1 x 6 inches (1.0 x 25 x 152 mm), cleaned by abrasive, if required to remove rust or oxidation, cleaned by wiping with a cloth dampened with acetone or other suitable solvent, coated with the blackening solution at room temperature in accordance with manufacturer's recommendations. Blackening solution shall be applied at the lowest use dilution recommended by the manufacturer. Three specimens shall be prepared for each test unless otherwise specified.

4.3.1.1 In order to determine compliance with 3.2.6, panels as in 4.3.1 shall be black oxide coated, in whole or part, in accordance with AMS 2485 prior to coating as in 4.3.1.

### 4.4 Approval:

Vendor shall assign to the product an identification of letters and/or numbers, traceable to a specific set of ingredients, methods of manufacture and manufacturing controls. If it is necessary to make any changes to the ingredients or proportions of ingredients, methods of manufacture, or to manufacturing controls, the unique name, number or series of letters and/or numbers shall also be changed (See 5.1.4).

#### 4.5 Reports:

The vendor of the blackening solution shall furnish with each shipment a report showing the results of tests to determine conformance to the technical requirements. This report shall include the purchase order number, AMS 2484B, manufacturer's identification, batch number, and quantity.

- 4.5.1 A material safety data sheet conforming to FED-STD-1313, or equivalent, shall be supplied to each purchaser prior to, or concurrent with, the report of preproduction test results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of the product for production use. Each request for modification of the product formulation shall be accompanied by a revised data sheet for the proposed formulation.

#### 4.6 Resampling and Retesting:

If any specimen used in the above tests fails to meet the specified requirements, disposition of the blackening solution may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the blackening solution represented. Results of all tests shall be reported.

#### 5. PREPARATION FOR DELIVERY:

##### 5.1 Packaging and Identification:

- 5.1.1 Packaging shall be accomplished to ensure that blackening solution, during shipment and storage, will be protected against damage from exposure to weather or other normal hazards.
- 5.1.2 Blackening solution may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.
- 5.1.3 Blackening solution shall be packaged in containers of a type and size acceptable to purchaser.
- 5.1.4 Each container shall be legibly marked with not less than AMS 2484B, purchase order number, vendor's identification, lot number, date of manufacture, quantity, and directions or precautions for use or storage.
- 5.1.5 Containers of blackening solution shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the solution to ensure carrier acceptance and safe delivery.

#### 6. ACKNOWLEDGMENT:

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.