



AEROSPACE MATERIAL SPECIFICATION

AMS-C-19853™

REV. A

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Superseding AMS-C-19853

Carbon Removing Compound (For Use in Agitated Tank)

RATIONALE

AMS-C-19853A has been reviewed and determined to contain straightforward and stable technology which is not dynamic in nature.

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NOTICE

This document has been taken directly from U.S. Military Specification MIL-C-19853D and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-C-19853D. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

Under Department of Defense policies and procedures, any qualifications requirements and associated qualified products lists are mandatory to DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this technical report.

1. SCOPE:

1.1 Scope:

This specification covers requirements for the acquisition of two types and two classes of material that will remove or loosen carbon from components of internal combustion engines and compressor sections of jet engines.

1.2 Classification:

The carbon removing compound is to be furnished in the following types and classes as specified (see 6.2c):

Type I - Phenolic

Type II - Non-phenolic

Class 1 - Unsealed (Single layer)

Class 2 - Sealed (Two layers)

2. APPLICABLE DOCUMENTS:

The following publications, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

2.1 U.S. Government Publications:

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

MIL-M-3171	Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion on
MIL-L-6082	Lubricating Oil, Aircraft Piston Engine (Non Dispersant Mineral Oil)
MIL-S-7952	Steel, Sheet and Strip, Uncoated, Carbon (1020 & 1025) (Aircraft Quality)
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-T-9046	Titanium and Titanium Alloy, Sheet, Strip, and Plate

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-290	Packaging of Petroleum and Related Products

QQ-A-250/4	Aluminum Alloy 2024, Plate and Sheet
QQ-A-250/13	Aluminum Alloy Alclad 7075, Plate and Sheet
QQ-P-416	Plating, Cadmium (Electrodeposited)

FED-STD-313	Material Safety Data Sheet, Transportation Data, and Disposal Data for Hazardous Materials Furnished to Government Activities
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2.2 SAE Publications:

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

AMS 4375	Sheet and Plate, Magnesium Alloy, 3.0Al-1.0Zn-0.20Mn, (AZ31B-0), Annealed and Recrystallized
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2.3 ASTM Publications:

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

ASTM D 891 Specific Gravity, Apparent, Liquid Industrial Chemicals
ASTM E 70 pH of Aqueous Solutions With the Glass Electrode

2.4 U.S. Pharmacopeial Convention, Inc:

Available from Mack Publishing Company, Easton, PA 18042.

United States Pharmacopeia (USP)

3. REQUIREMENTS:

3.1 Qualification:

The carbon removing compound furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable Qualified Products List at the time of award of contract (see 4.3 and 6.3).

3.2 Materials:

The carbon removing compound shall be liquid at 25°C (77°F). Its composition shall be optional with the manufacturer but shall be restricted by other requirements specified herein. The compound shall contain no benzene.

3.3 Toxicity:

The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertaining to the toxic effect shall be referred by the acquiring activity to the appropriate departmental medical service who will act as an advisor to the acquiring activity. Material safety data sheets shall be prepared and submitted in accordance with FED-STD-313. One copy of which shall be forwarded to the preparing activity of the specification, one copy to the acquiring activity, and one copy to the Naval Environmental Health Center (see 6.5).

3.4 pH of Seal:

The carbon removing compound seal shall have a pH value not less than 9.00 nor more than 12.00 when determined in accordance with 4.5.1.

3.5 Specific gravity:

The specific gravity of the carbon removing compound shall be not less than 1.15 for the organic layer and not more than 1.09 for the aqueous layer when determined in accordance with 4.5.2.

3.6 Flammability:

Class 1 compound and the solvent layer of class 2 compound shall continue to burn no longer than 3 seconds after the removal of the flame when tested in accordance with 4.5.3.

3.7 Volatility:

The volatility of the class 1 compound and the solvent layer of the class 2 carbon removing compound, as received, shall be no greater than the volatility of the lower layer of the control formula product when the compound is tested in accordance with 4.5.4.

3.8 Separation of layers (class 1 only):

When the class 1 compound is tested as specified in 4.5.5, the resulting mixture, after standing two hours, shall separate sharply into two distinct layers with no evidence of clots, curd, or precipitate. The aqueous layer shall be uppermost and the aqueous volume for each type shall be:

Type I (upper layer) - 25 ± 2 ml

Type II (upper layer) - 20, + 7, - 2 ml.

3.9 Phenolic content (type II only):

The type II, class 1, compound and the solvent layer of Type II, class 2, shall contain less than 0.03 percent by weight of phenol and/or cresol when tested as specified in 4.5.6.

3.10 Storage stability:

The carbon removing compound shall show no sediment, curd, or scum in the solvent layer or interface or any other evidence of deterioration and shall conform to the requirement of 3.12 when tested as specified in 4.5.10, after being stored as specified in 4.5.7.

3.11 Oil removal:

The carbon removing compound shall exhibit oil removal effectiveness equal to or greater than that shown by the control formula product similarly tested when tested as specified in 4.5.9.

3.12 Carbon removal:

The carbon removing compound shall possess carbon removal capability and speed of carbon removal equal to or greater than the control formula product when tested as specified in 4.5.10.

3.13 Corrosiveness:

The carbon removing compounds shall cause no visible trace of corrosion, oxidation, or discoloration of steel or anodized aluminum alloy and shall cause no visual corrosion and not more than slight discoloration of polished aluminum alloy, cadmium plated steel, or chrome pickled magnesium alloy when tested as specified in 4.5.11.

3.14 Rinsing properties:

The carbon removing compound shall be completely rinsed from the surface of the anodized aluminum alloy panel when tested as specified in 4.5.12. The panel shall show no evidence of a sticky film, soap, lime, curd, or physical dirt after it has been rinsed. The final rinse water on the panel surface shall form a smooth layer free from water break.

3.15 Compatibility (type I only):

After mixing the carbon removing compound with an equal volume of control formula product in accordance with 4.5.13, the combined volume of the upper and lower layers thus formed shall be respectively equal to the sum of the original volumes of the upper and lower layers of the material prior to mixing. The resulting mixture shall be equal to or better than the control formula product in carbon removing capability.

3.16 Emulsification:

The emulsion formed when the carbon removing compound is shaken with 12-1/2 grain hard water in accordance with 4.5.14, shall show no sediment, curd, scum, or clear solvent. Creaming shall be acceptable.

3.17 Cold stability:

The carbon removing compound shall return to its original condition after being exposed to a temperature of $-18^{\circ} \pm 5^{\circ}\text{C}$ ($0^{\circ} \pm 9^{\circ}\text{F}$) for one hour in accordance with 4.5.15.

3.18 Temperature cycle (stability):

After the carbon removing compound, with a steel strip partially immersed, has been stored in a glass bottle for five days as specified in 4.5.16, the compound shall show no marked variation in appearance compared to the original compound stored at room temperature in the dark. The immersed portion of the steel strip shall show no evidence of pitting, corrosion, or uneven darkening. The unexposed portion of the strip shall show no evidence of corrosion. There shall be no difference in appearance between the carbon removing compound that has undergone the temperature cycle (stability) test and an unexposed sample one hour after each has been shaken for one minute. The sample which has been heated shall meet the requirements of carbon removal capability (see 3.12).