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MIL-G-4343C
28 July 1978
SUPERSEDING
MIL-G-4343B
12 December 1963

MILITARY SPECIFICATION

GREASE, PNEUMATIC SYSTEM

This specification is approved for use by all departments and agencies of the Department of Defense

1. SCOPE

1.1 Scope. This specification covers a pneumatic system grease This grease is identified by NATO Code Number G 392 (see 6.5).

2. APPLICABLE DOCUMENTS

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

STANDARDS

FEDERAL

FED-STD-313	-Material Safety Data Sheets; Preparation and Submission of
FED-STD-791	-Lubricants, Liquid Fuels, and Related Products, Methods of Testing

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, New Jersey 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or letter

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MILITARY

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

(Copies of specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer)

2 2 Other publications The following documents form a part of this specification to the extent specified herein Unless otherwise indicated, the issues in effect on date of invitation for bids or request for proposal shall apply

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 217	-Cone Penetration of Lubricating Grease, Test for
D 270	-Petroleum and Petroleum Products, Sampling
D 942	-Oxidation Stability of Lubrication Greases by the Oxygen Bomb Method, Test for
D 1092	-Apparent Viscosity of Lubricating Greases, Test for
D 1743	-Rust Preventive Properties of Lubricating Greases, Test for
D 2265	-Dropping Point of Lubricating Grease of Wide Temperature Range, Test for
D 2595	-Evaporation Loss of Lubricating Greases Over Wide Temperature Range, Test for

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103)

(Technical society and technical association specifications and standards are generally available for reference from libraries They are also distributed among technical groups and using Federal agencies)

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3. REQUIREMENTS

3 1 Qualification. The grease furnished under this specification shall be a product which is qualified for listing on the applicable qualified products list at the time set for opening of bids. (see 4 4 and 6.3) Any change in the formulation of an approved product shall require requalification.

3 2 Materials. The pneumatic system grease shall consist essentially of, but not be limited to, a gelling agent and a suitable liquid lubricant. (See 6.1.1).

3 3 Physical requirements. The grease covered by this specification shall conform to the requirements of Table I when tested in accordance with 4.7 1.

Table I Physical Requirements (3.3)

Property	Limits
Corrosion on copper 1/	pass
Dropping point, °C,(°F), min	163 (325)
Penetration, worked, points	260 - 300
Apparent viscosity @ shear rate of 20 reciprocal seconds, poises, max.	5,000
Oil separation, percent weight loss in 30 hours, max.	5.0
Evaporation, percent weight loss in 22 hours at 99°C (210°F), max	2.5
Oxidation, pressure drop in 100 hours, psi, max.	5
Rubber swell, Standard L type rubber (see 6 4), percent	19 - 30
Rust preventative properties 2/	pass
Storage stability, change from original worked penetration, points, max	30

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1/ After 24 hours, the material shall show no green color, pitting, etching on copper, nor shall a dark brown or black stain remain on the copper strip after washing with n-hexane A slight brown stain is permissible.

2/ The grease coated bearings shall show no discoloration or corrosion in excess of three small spots per bearing. Pitting or etching shall not be acceptable

3 4 Odor The grease shall have only the odor of the pure liquid component and there shall be no odor of rancidity or perfume when examined in accordance with 4 7 2

3 5 Workmanship The grease shall be a smooth homogenous mixture, free of lumps and abrasive materials when examined in accordance with 4 7 3

3 6 Toxicity The grease shall have no adverse effect on the health of personnel when used for its intended purpose The grease shall contain no components which produce noxious vapors in such concentrations as to be an annoyance to personnel during formulation or use under conditions of adequate ventilation while exercising caution to avoid prolonged contact with the skin and while observing Occupational Safety and Health Administration (OSHA) guidelines Questions pertaining to the toxic effects shall be referred by the procuring activity to the appropriate departmental-medical service who will act as an advisor to the procuring activity (see 4 4)

4 QUALITY ASSURANCE PROVISIONS

4 1 Responsibility for inspection Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements

4 2 Classification of inspection The examination and testing of the grease shall be classified as follows

(a) Qualification inspection (4 4)

(b) Periodic qualification re-evaluation (4 5)

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(c) Quality conformance inspection (4.6)

4 3 Sampling.

4 3.1 Qualification samples. Qualification samples shall consist of ten one-pound cans of grease and one pint of the liquid lubricant base stock The samples shall be accompanied by a test report from the manufacturer or a commercial laboratory containing complete information as to the source and type of liquid lubricant base stock and gelling agent used, the formulation and composition of the finished grease, and laboratory data showing results of all the tests required by this specification except storage stability The samples and reports shall be forwarded to the Aircraft and Crew Systems Technology Directorate, Naval Air Development Center (Code 60612), Warminster, Pennsylvania 18974. The samples shall be plainly identified by securely attached durable tags or labels marked with the following information:

Sample for qualification inspection
GREASE, PNEUMATIC SYSTEM
MIL-G-4343C
Name of ingredient (for ingredient material)
Name of manufacturer
Product code number
Date of manufacture

Submitted by (name) (date) for qualification inspection in accordance with the requirements of MIL-G-4343C under authorization of (reference authorizing letter) (see 6 3)

4 3 1.1 Formulation sheets. An example of a satisfactory form for the formulation sheet, indicating the percentage and nature of each ingredient, is as follows·

Liquid lubricant base stock (Mfr's name and No)	percent
Gelling agent (Mfr's name and No)	percent

4 3 2 Periodic qualification reevaluation samples A periodic qualification reevaluation sample of ten one-pound cans of grease shall be selected at random from the first lot of grease processed under a contract or order after the product has passed qualification inspection Additional samples may be taken at intervals as considered necessary to verify the consistency of production quality. Periodic qualification reevaluation samples shall be forwarded to the laboratory responsible for qualification (see 4.3 1). The samples shall be plainly identified by securely attached durable tags or labels marked with the following information

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Sample for periodic qualification reevaluation
GREASE, PNEUMATIC SYSTEM
MIL-G-4343C
Name of manufacturer
Product code number
Date of manufacture
Contract or order number
Batch number

4.3 3 Quality conformance inspection samples The quality conformance inspection samples shall consist of a sample for tests (4 3.3 3) and samples for examination of filled containers (4.3 3 4). Samples shall be labeled completely with information identifying the purposes of the sample, name of product, specification number, lot or batch number, date of sampling, and contract number.

4 3 3 1 Bulk lot A bulk lot (batch) is an indefinite quantity of homogeneous mixture or material offered for acceptance in a single isolated container, or manufactured in a single plant run (not exceeding 24 hours) through the same processing equipment, with no change in ingredient material

4 3 3 2 Packaged lot A packaged lot is an indefinite number of 55-gallon drums or smaller unit containers of identical size and type, offered for acceptance, and filled with a homogeneous mixture of material from one isolated container, or filled with a homogeneous mixture of material manufactured in a single plant run (not exceeding 24 hours) through the same processing equipment, with no change in ingredient material

4 3 3 3 Samples for tests Take samples for tests in accordance with ASTM D270 The samples shall be subjected to all the applicable Quality conformance tests If the samples for tests fail any of the Quality conformance tests, the inspection lot shall be rejected

4.3 4 Samples for examination of filled containers. Random samples of filled unit containers and a sample of shipping containers fully prepared for delivery shall be selected from each lot of grease in accordance with MIL-STD-105 at inspection level II and acceptable quality level (AQL) = 2 5 percent defective

4 4 Qualification inspection. Qualification inspection shall consist of a review for approval of the submitted manufacturer's report and subjecting the qualification samples (4.3.1) to examination and testing for all the requirements of this specification. Material Safety Data Sheets on toxicity shall be prepared and submitted to the Qualifying Laboratory (4.3 1) in accordance with FED-STD-313 (see 3 6).

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4 5 Periodic qualification reevaluation The periodic qualification reevaluation performed by the qualification laboratory shall consist of examining and testing the periodic qualification reevaluation sample for all the requirements of this specification except storage stability Delivery of the grease will not be delayed pending completion of this inspection If the results of the periodic qualification reevaluation are in accordance with the requirements of this specification, the consistency of production quality shall be thereby verified Failure of the grease to pass a periodic qualification reevaluation shall require the acceptance and further shipment of the grease to be withheld until the contractor has corrected the conditions which led to the failure (see 6 3 1) Further failure will constitute cause for rejection and removal from the Qualified Products List

4 6 Quality conformance inspection Quality conformance inspection shall consist of testing the samples for test (4 3 3.3) for all the requirements specific in section 3 except apparent viscosity, rubber swell, rust preventative properties, storage stability and examination of the samples of filled containers (4 3.3 4) for conformance to 5 1

4 7 Inspection methods Inspection shall be in accordance with Method 9601 of FED-STD-791.

4 7 1 Tests shall be performed in accordance with the applicable methods specified in Table II, and 4 7 2 through 4 7 4 Physical values specified in Section 3 apply to the average of the determinations made on the samples for those values which fall within any stated repeatability limits of the applicable test method

Table II Test Methods (4.7 1)

Test	FTMS 791 Method No.	ASTM Method No
Corrosion on copper	5309	
Dropping point		D2265
Penetration, worked		D217
Apparent viscosity 1/		D1092
Oil separation	321	
Evaporation		D2595

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Table II Test Methods (4.7.1)

Test	FTMS 791 Method No.	ASTM Method No.
Oxidation		D942
Rubber swell 2/	3603	
Rust preventative properties 3/		D1743
Storage stability 4/		D217

1/ Test shall be performed at -54 ± 0.3°C (-65 ± 0 5°F) by placing the apparatus in a suitable low temperature box or cold bath. The grease shall be conditioned at the test temperature for a period of 16 to 24 hours if in an air bath or 4 hours minimum in a liquid bath, prior to making the viscosity determination.

2/ See 6.4

3/ Disregard Numerical Ratings for corrosion.

4/ After testing for worked penetration, the original sample shall be stored for 4 months at 38 ± 3°C (100 ± 5°F) and retested for worked penetration.

4 7 2 Odor. The odor of the finished grease shall be compared with the odor of a sample liquid lubricant base stock. Comparison shall be performed with both samples at room temperature.

4 7 3 Workmanship. Approximately a three ounce sample of finished grease shall be spread on a clean glass plate to a thickness of 0 001 in maximum and visually examined for conformance with 3 5.

4 7 4 Examination of filled containers Each sample of filled container and shipping container shall be examined for defects of construction of the container and closure, evidence of leakage, and net content. Any container in the sample having one or more defects or under required fill shall be rejected, and if the number of defective containers in any sample exceeds the acceptance number for the appropriate sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected Rejected lots may be resubmitted for acceptance inspection provided that the contractor has removed or repaired all non-conforming containers

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5 PACKAGING

5 1 Packaging, packing and marking Packaging, packing and marking shall be in accordance with MIL-STD-290

6. NOTES

6.1 Intended use. The grease is intended for use as a lubricant between rubber and metal parts of pneumatic systems It may also be used for pressurized cabin bulkhead grommets and other mechanisms requiring rubber to metal lubrication Suitability for extreme low temperature operation, where low moving torques are available, should be established by simulated service test

6 1 1 The composition of the grease is not limited but substantial amounts of nonpetroleum materials may be required to meet this specification Silicone-di-ester oil blends are known to be suitable for use as a liquid component of this grease

6.2 Ordering data Procurement documents should specify the following

(a) Title, number and date of this specification

(b) Type and size of containers (see 5 1)

(c) Quantity

(d) Selection of applicable levels of packaging and packing with requirements in detail, (see 5 1)

(e) Toxicological data requirements (3 6 and 4 4)

6 2 1 List of qualified products Products considered acceptable under this specification are listed in QPL-4343 and subsequent revisions thereto

6 3 Qualification With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government, tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification The activity responsible for the qualified products list is the Naval Air Systems Command, Department of the Navy, however, information pertaining to qualification or products may be obtained from

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the Aircraft and Crew Systems Technology Directorate, Naval Air Development Center, (Code 60612) Warminster, Pennsylvania 18974.

6 3.1 It is understood that the material furnished under this specification subsequent to final approval shall be of the same composition and shall be equal to products upon which approval was originally granted In the event that the grease furnished under contract is found to deviate from the composition of the approval product, or that the product fails to perform satisfactorily, approval of such products will be subject to immediate withdrawal form the Qualified Products List

6 4 Samples of the standard synthetic rubber L for the test specified in Table I may be obtained from the Aircraft and Crew Systems Technology Directorate, Naval Air Development Center, (Code 60612) Warminster, Pennsylvania 18974

6.5 The provisions of 1 1 of this specification are the subject of international standardization agreement (ASCC Air Standard 15/1, STANAG 1135) When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Office (DepSO) so that appropriate action may be taken respecting the international agreement concerned

6.6 Changes from previous issues Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes

Custodians
Army - MR
Navy - AS
Air Force - 11

Review Interest
Army - MI, AT, AV, EA
Navy - OS
DLA - DS, GS

International Interest
NATO (see 6 5)

Preparing activity.
Navy - AS
(DOD Project 9150-0484)

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