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MIL-G-5634C  
5 June 1970  
SUPERSEDING  
MIL-G-5634B  
17 Feb 1966

MILITARY SPECIFICATION

GRAIN, ABRASIVE, SOFT, FOR CARBON REMOVAL

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers soft abrasive grains to be used as abrasive blasting material for the removal of carbon from metal surfaces, and cleaning of operating jet engines.

1.2 Classification. Abrasive grains shall be of the following types as specified:

- Type I - Apricot Pit Shell (for use on aircraft jet engines or general purpose use)
- Type II - Pecan Shell (for general purpose use only)
- Type III - Black Walnut Shell (for use on aircraft jet engines or general purpose use)
- Type IV - Corn Cob (for general purpose use only)
- Type V - Rice Hull (for general purpose use only)
- Type VI - English Walnut Shell, Apricot Pit Shell or Mixture of the Two (for use on aircraft jet engines only)

2. APPLICABLE DOCUMENTS

2.1 The following documents, 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.

SPECIFICATIONS

Federal

- |          |  |
|----------|--|
| RR-S-366 | Sieves, Standard, for Testing Purposes |
| TT-T-548 | Toluene, Technical                     |
| UU-S-48  | Sacks, Shipping Paper                  |

Military

MIL-A-13374

Adhesive Dextrin

STANDARDS

Military

MIL-STD-105

Sampling Procedures and Tables for  
Inspection by Attributes

MIL-STD-129

Marking for Shipment and Storage

MIL-STD-147

Palletized and Containerized Unit  
Loads 40"x60" Pallets, Skids, Run-  
ners, or Pallet Type Base

(Copies of specifications, standards, and publications 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 issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials

ASTM D 95

Water in Petroleum and Other Bitumi-  
nous Materials

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

3. REQUIREMENTS

3.1 Preproduction sample. This specification requires a preproduction test. The contractor shall furnish a preproduction sample for examination and tests according to this specification prior to the submission of the remainder of the material under the contract. Approval of the preproduction sample by the procuring activity shall not relieve the contractor of his obligation to supply material conforming to this specification.

3.2 Materials. The grain abrasive shall be manufactured from first quality apricot pit shells, pecan shells, black walnut shells, corn cobs, rice hulls, or english walnut shells.

3.3 Particle size. The abrasive shall have the particle size distribution as shown in Table I.

TABLE I

U. S. Standard Screen Size	Types I, II or III % Retained		Type IV % Retained		Type V % Retained		Type VI % Retained	
	Min	Max	Min	Max	Min	Max	Min	Max
10	-	0.0	-	-	-	-	-	-
12	-	5.0	-	0.0	-	0.0	-	-
16	-	-	-	17.0	-	-	-	-
20	90.0	-	-	64.0	20.0	-	-	-
30	-	5.0	-	-	-	-	-	0.0
40	-	-	-	20.0	65.0	-	-	4.0
80	-	-	-	-	-	8.0	-	-
100	-	1.0	-	-	-	-	88.0	-
140	-	-	-	-	-	-	-	6.0
PAN	-	0.05	-	1.0	-	1.5	-	2.0

3.4 Splinters. Types I, II, III, IV and VI abrasives shall contain not more than one percent, and Type V shall contain not more than three percent by weight of particles having a length greater than 0.15 inch when tested as specified in 4.4.3.

3.5 Particle shape. Types I, II, III, and VI shall be of an irregular, angular shape having sharp edges and corners. The Type IV shall be generally symmetrical with approximately equal dimensions along the three normal axes. The Type V shall be flake form, approximately rectangular in shape.

3.6 Specify gravity. The specific gravity of all types, except Type V, shall be from 1.20 to 1.40; and the specific gravity of Type V shall be from 1.10 to 1.55 when tested as specified in 4.4.4.

3.7 Water content. The water content of the abrasive shall not exceed 10 percent by weight when tested as specified in 4.4.5.

3.8 Toluene soluble content. The toluene soluble content shall not exceed 1.5 percent by weight when tested as specified in 4.4.5.

3.9 Workmanship. The product shall be free (in excess of 0.01% by weight) from adulterating foreign matter, such as, particles of sand, metal, earth, stone, wood, pith, beeswing, or other inorganic grit which could affect the safety of its use on metal surfaces. Decayed or moldy material shall not be used (see 6.3).

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Preproduction tests. Unless otherwise specified in the contract or order, one sample unit (50 pounds composite) of abrasive, identical to the product which the manufacturer will produce in fulfillment of the contract or order, shall be submitted to an activity designated by the procuring officer for preproduction tests. The preproduction tests shall be all examinations and tests of this specification that can be applied to a unit bag of abrasive.

4.2 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, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.3 Lot. For the purpose of examination and test, a lot shall consist of all of the same type abrasive offered for delivery at one time. For shipments greater than one carload, each carload or less shall constitute a lot.

4.3.1 Sampling for examination and test. Random samples shall be selected from each lot offered to the Government in accordance with MIL-STD-105 at Inspection Level S2. The sample unit shall be a 50 pound composite of abrasive.

4.3.2 Sample preparation for test. Each sample selected as specified in 4.3.1 shall be quartered and the required samples selected for the following tests. Failure of any sample bag of abrasive to pass the specified tests shall be cause for rejection of the lot.

#### 4.4 Testing.

4.4.1 Material, particle shape, and workmanship. Each sample bag of abrasive selected in accordance with 4.3.1 shall be carefully examined under 20X magnification for conformance with this specification with respect to material, particle shape, and workmanship. Presence of foreign matter as defined in 3.9 shall be cause for rejection of the lot.

#### 4.4.2 Particle size by screen analysis.

4.4.2.1 Apparatus. The shaker shall operate with a single eccentric circular motion at  $285 \pm 10$  revolutions per minute and with a tapping action of  $150 \pm 5$  strokes per minute to obtain a dependable sieve analysis. The shaker shall accommodate six 8-inch diameter sieves with pan and cover. Screen sizes shall conform to U.S. Standard screen sizes as specified in RR-S-366.

4.4.2.2 Procedure. The sieves shall be nested in the order of decreasing size with the largest sieve on top and a pan at the bottom. A sample weighing 100 grams shall be obtained, weighed to the nearest 0.1 gram, and placed on the top sieve of the nest. The nest of sieves with the cover in position shall be placed in the testing machine and vibrated for exactly 3 minutes with the taper in operation. The abrasive remaining on each sieve and pan shall be weighed and reported. Calculate the necessary percentages to determine compliance with 3.3.

4.4.3 Splinters. Weigh out approximately 5 grams of the abrasive and determine the weight to the nearest 0.01 gram. Spread the sample on a sheet of paper ruled in squares having sides of 0.15 inches. Separate and weigh to the three significant digits the particles over 0.15 inch long. Calculate the percent by weight of splinters and determine compliance with 3.4.

4.4.4 Specific gravity. Prepare four mixtures of perchloroethylene (tetrachloroethylene) and petroleum naphtha, adjusting the specific gravity of each to 1.10, 1.20, 1.40, and 1.55. Place 75 ml of each mixture in each of four stoppered 100 ml graduates. Add 30 grams of the abrasive to each graduate, shake vigorously, and allow to stand for 30 minutes. Tap the graduates to detach any air bubbles from the abrasive. Determine compliance with 3.6.

4.4.5 Water content and toluene solubles.

4.4.5.1 Apparatus. Use the apparatus described in ASTM D 95, Figure 1 (Glass).

4.4.5.2 Procedure. Place an accurately weighed 50 gram sample of the abrasive and 250 milliliters of toluene, TT-T-548, in a 500 milliliter flask. Assemble with a clean distilling tube receiver and reflux condenser closed with a calcium chloride drying tube. Distill the mixture until the interior of the glassware is uniformly wetted with the solvent. The distillation shall then be continued for 30 minutes. After cooling, determine the moisture content of the sample by reading the meniscus of the water layer in the trap and calculating the percentage. Determine compliance with 3.7.

Filter the contents of the flask, washing with a small portion of fresh toluene; place the filtrate in a tared dish; and evaporate to dryness or to a thick viscous oil of constant weight by gentle heating, without flame, in a stream of air. Weigh the residue and calculate its percentage to obtain the percent of toluene solubles. Determine compliance with 3.8.

4.5 Examination of preparation for delivery. An examination shall be made to assure that the packaging, packing, and marking requirements of Section 5 are complied with. Samples shall be selected from each lot in accordance with MIL-STD-105 at Inspection Level I. The sample unit for examination of net content,

bagging, closure, and marking requirements shall be one completed bag. The sample unit for palletizing shall be one loaded pallet ready for shipment. The AQL for packaging, packing, marking, and palletizing shall be 4.0% defective.

Examine

Appearance	Incorrect size or style bag; puncture break; leakage
Closures	Bag closures not as specified
Markings	Exterior markings incomplete, illegible, or incorrect; not according to contrast requirements
Net contents	Minimum 50 pounds net weight
Pallet type	Not as specified
Stacking, corners and caps	Not as specified
Bonding and strapping	Not as specified
Compressability of load	Not as specified
Load Limit	Exceeds the 2500 pound limit

4.6 Rejection. When the acceptance test sample fails to meet any of the test requirements of this specification or when the number of defective filled containers exceeds the acceptance number as specified in 4.5, the lot represented by the sample shall be rejected.

5. PREPARATION FOR DELIVERY

5.1 Packing.

5.1.1 Level A. The material shall be packed for overseas shipment in 50 pound, multi-wall paper shipping sacks which conform to UU-S-48, Type I, II, III, or IV and have 9(2) or 9X(2) construction and dipped ends.

5.1.1.1 The sacks shall be palletized on commercial, expendable type, wood pallets. Pallets must permit four-way entry by manual or mechanized loading equipment (i.e., pallet trucks, high or low lift fork trucks) and shall be capable of withstanding superimposed loading.

5.1.1.2 The sacks shall be bonded together by applying four inch squares of adhesive, conforming to MIL-A-13374, and arranged flat in interlocking courses.

5.1.1.3 Types and sizes of strapping and strapping patterns shall be according to MIL-STD-147.

5.1.2 Level B. The material shall be packed for domestic shipment in fifty pound, multi-wall shipping sacks which conform to UU-S-48, Type I, II, III, or IV and have 9(2) or 9X(2) construction.

5.1.3 Level C. The material shall be packed for shipment in 50 pound sacks according to the supplier's commercial practice, in a manner to assure acceptance by the common carrier and safe delivery at the destination. Shipments shall comply with the Uniform Freight Classification Rules, and regulations of other carriers as applicable to the mode of transportation.

5.2 Weight. The maximum gross weight of each palletized load shall not exceed 2500 pounds.

5.3 Marking. In addition to any special markings indicated in the contract or purchase order, all shipping sacks shall be marked according to MIL-STD-129.

## 6. NOTES

6.1 Intended use. The grain abrasive covered by this specification is intended as an abrasive blasting material to clean metal surfaces. Types I, III, and VI of the grains are used to clean carbon deposits from the air passages and turbine blades of operating turbojet engines.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of specification.
- b. Type of grain.
- c. Level of packing and packaging.
- d. Specify "turbojet approved grain only" when applicable.

6.3 Suppliers should be aware of the importance of a clean product, free from all foreign matter, when the grain (Types I, III, and VI) is to be applied to cleaning operating turbojet engines (See 3.9).

### Custodians:

Army - MR  
Navy - AS  
Air Force - 84

Preparing Activity:  
Air Force - 84

### Review Activities:

Army - ME, WC  
Navy - SH  
Air Force - 84

Project No. 5350-0058

### User Activity:

Navy - MC

DEC 30 1974

MIL-G-5634C  
Amendment 2  
5 November 1974

MILITARY SPECIFICATION

GRAIN, ABRASIVE, SOFT, FOR CARBON REMOVAL

This amendment forms a part of Military Specification MIL-G-5634C, 5 June 1970.

Page 1, Paragraph 1.2 - Add the following type:

Type VII - Peach Pits (for use on aircraft jet engines or general purpose use).

Page 2, Paragraph 3.1 - After the words "english walnut shells", add the words "peach pits".

Page 3, Table I - In the heading of the first column, add "Type VII" and in the heading of the fifth column, add "Type VII".

Page 3, Table I - Under Type V (rice hulls), change "% Retained" to read as follows:

U.S. STD SCREEN SIZE	MIN	MAX
20	14	-
40	65	-
80	-	18

Page 3, Paragraph 3.4 - Add "Type VII" after the words, "Types I, II, III, IV, and VI".

Page 3, Paragraph 3.5 - Add "Type VII" after the words, "Types I, II, III, and VI".

Page 7, Paragraph 6.3 - Add "Type VII" after the words "(Types I, II, and VI)".

Custodians:

Army - MR  
Navy - AS  
Air Force - 84

Preparing Activity:

Air Force - 84

Review Activities:

Army - ME, WC  
Navy - SH

Project No:

5350-0052

User Activity:

Navy - MC



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MIL-G-5634C  
AMENDMENT 3  
22 January 1979

MILITARY SPECIFICATION  
GRAIN, ABRASIVE, SOFT, FOR CARBON REMOVAL

This amendment forms a part of Military Specification MIL-G-5634C, 5 June 1970.

Page 3, Paragraph 3.5 — Delete the second sentence in its entirety and substitute the following: "The Type IV shall be either symmetrical with approximately equal dimensions along the three normal axis (hammer mill process) or irregularly shaped with sharp edges or corners (roller mill process)."

Custodians:

Army: MR  
Air Force: 99

Preparing Activities:

Air Force: 99

Review Activities:

Army: ME, 'AR  
Navy: SH

Project No:

5350-0060

User Activities:

Navy: MC

FSC 5350



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