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MILITARY SPECIFICATION

METAL GRIT AND SHOT FOR BLAST CLEANING AND PEENING

This specification was approved by the Departments of the Army, the Navy, and the Air Force for use of procurement services of the respective Departments.

1. SCOPE

1.1 Scope.—This specification covers chilled or hardened iron or steel grit and shot for blast cleaning of sand, slag, rust and marine incrustations from castings, forgings, ship hulls and decks, or other parts prior to use, and also chilled or hardened shot for peening to improve the surface or control the physical properties of the surface material.

1.2 Classification.

1.2.1 *Types.*—Grit and shot shall be of the following types, as specified (see 6.3):

Type I—Steel.
Type II—Chilled iron.

1.2.2 *Grades.*—Grit shall be of the following grades, as specified (see 6.3):

Grade A—for special blast cleaning.
Grade B—for general blast cleaning.

1.2.3 *Classes.*—Shot shall be of the following classes, as specified (see 6.3):

Class 1—for peening.
Class 2—for cleaning.

1.2.4 *Sizes.*—Grit and shot shall be furnished in the sizes shown in tables I, II, and III, as specified. (See 6.3.)

2. APPLICABLE SPECIFICATIONS AND OTHER PUBLICATIONS

2.1 Specifications.—The following specifications, of the issue in effect on date of invitation for bids, form a part of this specification:

FEDERAL SPECIFICATION

RR-S-366—Sieves, Standard Testing.

U. S. ARMY SPECIFICATIONS

94-40645—Marking; Exterior, Domestic and Export Shipment by Contractors.

100-2—Standard Specification for Marking Shipments by Contractors.

NAVY DEPARTMENT SPECIFICATION

General Specifications for Inspection of Material.[1]

(*Army.*—Copies of specifications should be obtained from the procuring agency or as directed by that agency. Both the title and identifying number or symbol should be stipulated when requesting copies.)

(*Navy.*—Copies of Federal, Military, and Navy Department specifications may be obtained upon application to the Bureau of Supplies and Accounts, Navy Department, Washington 25, D. C., except that activities of the Armed Forces should make application to the Commanding Officer, Naval Supply Center, Norfolk 11, Va. Both the title and identifying number or symbol should be stipulated when requesting copies.)

(*Air Force.*—Copies of Federal, Military, and U. S. Army specifications may be obtained upon application to the Commanding General, Air Matériel Command, Wright-Patterson Air Force Base, Dayton 1, Ohio. Both the title and identifying number or symbol should be stipulated when requesting copies.)

(*Marine Corps.*—Copies of Federal and Military specifications may be obtained upon application to the Quartermaster General, Headquarters U. S. Marine Corps, Navy Department, Washington 25, D. C., or the Depot Quartermaster, Marine Corps Depot of Supplies, 1100 South Broad Street, Philadelphia 46, Pa. Both the title and identifying number or symbol should be stipulated when requesting copies.)

2.2 Other publications.—The following publication, of the issue in effect on date of invitation for bids, forms a part of this specification:

BUREAU OF SUPPLIES AND ACCOUNTS PUBLICATION

Navy Shipment Marking Handbook.

(Copies of the Navy Shipment Marking Handbook should be obtained from the sources given for obtaining specifications for the Navy.)

[1] Applicable only to Navy purchases.

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3. REQUIREMENTS

3.1 Material.—Grit and shot shall be manufactured from chilled iron or from heat-treated steel.

3.2 Composition and heat-treatment.—The composition and heat treatment shall be selected to produce a grit or shot which will withstand the necessary impact in use without excessive breaking or flattening of the particles.

3.3 Grit.—The grit shall consist entirely of angular particles produced by crushing chilled iron or heat-treated steel shot, and shall be free as far as practicable from rounded particles.

3.4 Shot.—The shot shall be spherical in shape and free as far as practicable from elongated and angular particles.

3.5 Screening.

3.5.1 *Grit.*—The individual sizes of the grit shall be in accordance with table I.

TABLE I.—*Screening tolerances for grit.*

Grade	Grit size	High limit screen		Oversize screen		Nominal screen		Low limit screen	
		Retained (maximum)	Screen number and aperture	Retained (maximum)	Screen number and aperture	Retained (minimum)	Screen number and aperture	Passing (maximum)	Screen number and aperture
		Percent	*Inches*	*Percent*	*Inches*	*Percent*	*Inches*	*Percent*	*Inches*
A	25	0	16(0. 0469)	25	18(0. 0394)	80	25(0. 0280)	5	30(0. 0232)
	40	0	18(0. 0394)	25	25(0. 0280)	80	40(0. 0165)	5	50(0. 0117)
B	14	0	10(0. 0787)	------	----------	80	14(0. 0555)	10	16(0. 0469)
	16	0	12(0. 0661)	------	----------	75	16(0. 0469)	15	18(0. 0394)
	18	0	14(0. 0555)	------	----------	75	18(0. 0394)	15	25(0. 0280)
	25	0	16(0. 0469)	------	----------	70	25(0. 0280)	20	40(0. 0165)
	40	0	18(0. 0394)	------	----------	70	40(0. 0165)	20	50(0. 0117)
	50	0	25(0. 0280)	------	----------	65	50(0. 0117)	25	80(0. 0070)
	80	0	40(0. 0165)	------	----------	65	80(0. 0070)	25	120(0. 0049)
	120	0	50(0. 0117)	------	----------	60	120(0. 0049)	30	200(0. 0029)

3.5.2 *Cleaning shot.*—The individual sizes of cleaning shot shall be in accordance with table II.

TABLE II.—*Cleaning shot numbers and screening tolerances*

[Percent of total sample by weight retained by ON screen and passed by THROUGH screen. 4 (0.187) denotes screen No. 4 with 0.187 inch aperture]

Shot No.	On screen	Percent (maximum)	Through screen	On screen	Percent (maximum)	Through screen	On screen	Percent (minimum)	Through screen	On screen	Percent (maximum)	Through screen	Percent (maximum)
1320	4(0. 187)	0	----------	----------	------	4(0. 187)	6(0. 132)	90	6(0. 132)	7(0. 111)	7	7(0. 111)	3
1110	5(0. 157)	0	----------	----------	------	5(0. 157)	7(0. 111)	90	7(0. 111)	8(0. 0937)	7	8(0. 0937)	3
930	6(0. 132)	0	----------	----------	------	6(0. 132)	8(0. 0937)	90	8(0. 0937)	10(0. 0787)	7	10(0. 0787)	3
780	7(0. 111)	0	----------	----------	------	7(0. 111)	10(0. 0787)	85	10(0. 0787)	12(0. 0661)	12	12(0. 0661)	3
660	8(0. 0937)	0	----------	----------	------	8(0. 0937)	12(0. 0661)	85	12(0. 0661)	14(0. 0555)	12	14(0. 0555)	3
550	10(0. 0787)	0	----------	----------	------	10(0. 0787)	14(0. 0555)	85	14(0. 0555)	16(0. 0469)	12	16(0. 0469)	3
460	10(0. 0787)	0	10(0. 0787)	12(0. 0661)	5	12(0. 0661)	16(0. 0469)	80	16(0. 0469)	18(0. 0394)	11	18(0. 0394)	4
390	12(0. 0661)	0	12(0. 0661)	14(0. 0555)	5	14(0. 0555)	18(0. 0394)	80	18(0. 0394)	20(0. 0331)	11	20(0. 0331)	4
330	14(0. 0555)	0	14(0. 0555)	16(0. 0469)	5	16(0. 0469)	20(0. 0331)	80	20(0. 0331)	25(0. 028)	11	25(0. 028)	4
230	18(0. 0394)	0	18(0. 0394)	20(0. 0331)	10	20(0. 0331)	30(0. 0232)	75	30(0. 0232)	35(0. 0197)	12	35(0. 0197)	3
170	20(0. 0331)	0	20(0. 0331)	25(0. 028)	10	25(0. 028)	40(0. 0165)	75	40(0. 0165)	45(0. 0138)	12	45(0. 0138)	3
110	30(0. 0232)	0	30(0. 0232)	35(0. 0197)	10	35(0. 0197)	50(0. 0117)	70	50(0. 0117)	80(0. 007)	10	80(0. 007)	10
70	40(0. 0165)	0	40(0. 0165)	45(0. 0138)	10	45(0. 0138)	80(0. 007)	70	80(0. 007)	120(0. 0049)	10	120(0. 0049)	10

NOTE.—Percentages given on the basis of weight as determined by the test procedure for shot.

3.5.3 *Peening shot.*—The individual sizes of peening shot shall be in accordance with table III.

TABLE III.—*Peening shot numbers and screening tolerances*

[Percent of total sample by weight retained on each pertinent screen]

Peening shot No.	High-limit screen		Oversize screen		Nominal screen		Low-limit screen	
	Shot retained, percent (maximum)	Screen number and aperture	Shot retained, percent (maximum)	Screen number and aperture	Shot retained, percent (minimum)	Screen number and aperture	Shot retained, percent (maximum)	Screen number and aperture
P157	0	3½(0. 223)	2	4(0. 187)	90	5(0. 157)	5	6(0. 132)
P132	0	4(0. 187)	2	5(0. 157)	90	6(0. 132)	5	7(0. 111)
P111	0	5(0. 157)	2	6(0. 132)	90	7(0. 111)	5	8(0. 0937)
P93	0	6(0. 132)	2	7(0. 111)	90	8(0. 0937)	5	10(0. 0787)
P78	0	7(0. 111)	2	8(0. 0937)	90	10(0. 0787)	5	12(0. 0661)
P66	0	8(0. 0937)	2	10(0. 0787)	90	12(0. 0661)	5	14(0. 0555)
P55	0	10(0. 0787)	5	12(0. 0661)	85	14(0. 0555)	7	16(0. 0469)
P46	0	12(0. 0661)	5	14(0. 0555)	85	16(0. 0469)	7	18(0. 0394)
P39	0	14(0. 0555)	5	16(0. 0469)	85	18(0. 0394)	7	20(0. 0331)
P33	0	16(0. 0469)	5	18(0. 0394)	85	20(0. 0331)	7	25(0. 0280)
P28	0	18(0. 0394)	5	20(0. 0331)	80	25(0. 0280)	12	30(0. 0232)
P23	0	20(0. 0331)	5	25(0. 0280)	80	30(0. 0232)	12	35(0. 0197)
P19	0	25(0. 0280)	5	30(0. 0232)	80	35(0. 0197)	12	40(0. 0165)
P16	0	30(0. 0232)	5	35(0. 0197)	80	40(0. 0165)	12	45(0. 0138)
P13	0	35(0. 0197)	5	40(0. 0165)	75	45(0. 0138)	17	50(0. 0117)
P11	0	40(0. 0165)	5	45(0. 0138)	75	50(0. 0117)	17	60(0. 0098)
P9	0	45(0. 0138)	5	50(0. 0117)	70	60(0. 0098)	22	70(0. 0083)
P8	0	50(0. 0117)	5	60(0. 0098)	70	70(0. 0083)	22	80(0. 0070)
P7	0	60(0. 0098)	5	70(0. 0083)	70	80(0. 0070)	22	100(0. 0059)
P6	0	70(0. 0083)	5	80(0. 0070)	70	100(0. 0059)	22	120(0. 0049)

3.6 Workmanship.—The grit and shot shall be free from defective material which will affect the serviceability.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 Lot.—Unless otherwise specified, a lot shall consist of a single order of 2,000 pounds or less of grit or shot of one grade and size.

4.2 Sampling.

4.2.1 When the material is sampled at the manufacturing plant before packing for shipment, a composite sample weighing 25 pounds shall be obtained by the Government inspector by taking approximately 1 pound increments at suitable intervals after the final screening operation.

4.2.2 When the material has been packed for shipment a 25-pound sample shall be composed of 5-pound composite samples removed by the Government inspector from five bags selected at random from each lot.

4.2.3 The sample collected in accordance with 4.2.1 or 4.2.2 shall be shipped to a Government laboratory when specified (see 6.3). When the manufacturer has the necessary testing equipment, the tests may be made at the place of manufacture under the supervision of the Government inspector.

4.3 Screening tests.—A representative 100-gram portion of the sample shall be subjected to the screening test as follows: Standard testing sieves in accordance with Specification RR–S–366 shall be used in making the screening tests. A rotating and tapping type of testing machine shall be used. The shaking speed shall be 275 to 295 rotations per minute; 145 to 160 taps per minute shall be applied. Shaking and tapping shall be continued for 5 minutes ± 5 seconds when a nominal sieve size of 35 or

coarser is used. For nominal sizes finer than number 35 sieve, shaking shall continue for 10 minutes ± 5 seconds.

4.4 **Acceptance of lots.**—When the sample is found to be not in conformance with this specification, the entire lot shall be rejected. When tests are conducted at a Government laboratory, and unless otherwise specified, lots shall be accepted only after receipt of a satisfactory test report by the Government inspector.

5. PREPARATION FOR DELIVERY

5.1 **Packing for domestic or overseas shipment.**—The grit and shot shall be commercially packed in bags to insure acceptance by common or other carrier for safe transportation at the lowest rate to the point of delivery. For shipments overseas or where the grit and shot will be stored in locations of excessive humidity and salinity, the bags shall be placed in watertight steel drums.

5.2 **Marking.**—In addition to any special marking required by the contract or order, shipments for the Army shall be marked in accordance with Specification 100–2; for the Navy, in accordance with the Navy Shipment Marking Handbook; for the Marine Corps, as specified (see 6.3); and for the Air Force, in accordance with Specification 94–40645.

5.2.1 *For identification.*—Each interior container shall be legibly marked or labeled with the following information in such a manner that the marking will not become damaged when package is opened:

Nomenclature_____
Grade_____
Size_____
Specification No_____
Order No_____
Stock No_____
Date of manufacture_____
Quantity_____
(Mfgr.'s name or trademark)_____

6. NOTES

6.1 **Intended use.**

6.1.1 *Grade A grit.*—Grade A grit is intended for use in special blast cleaning equipment and for purposes where the absence of excessive fines is required.

6.1.2 *Grade B grit.*—Grade B grit corresponds to standard commercial screen sizes and is suitable for most stationary blast cleaning equipment for foundries and for general blast cleaning purposes.

6.1.3 *Class 1 shot.*—Peening shot corresponds to standard commercial screen sizes and is intended for use in cold working metallic surfaces to remove tensile stresses from these surfaces and to impart fatigue resisting properties.

6.1.4 *Class 2 shot.*—Cleaning shot corresponds to standard commercial screen sizes and is intended for use in the removal of sand scale, dirt, and other extraneous material from metal surfaces, where the cutting action of grit is undesirable.

6.2 **Usage limitations.**—The material covered by this specification should not be used on materials such as aluminum or magnesium alloy in those cases where ferrous residue from the grit or shot may cause harmful galvanic action.

6.3 **Ordering data.**—Requests, requisitions, schedules, and contracts or orders should specify the following:

a. Title, number and date of this specification.

b. Type of grit or shot required. (See 1.2.1.)

c. Grade of grit required. (See 1.2.2.)

d. Class of shot required. (See 1.2.3.)

e. Size of grit or shot required. (See 1.2.4.)

f. Laboratory to which sample is to be submitted, when required. (See 4.2.3.)

g. Whether subject commodity is to be packaged and prepared for overseas or domestic shipment. (See sec. 5.)

h. Marking required for Marine Corps. (See 5.2.)

Notice.—When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodian:

Navy—Bureau of Ships

Other interest:

Army—OT
Navy—AMCOSY
Air Force.

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