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COMMERCIAL ITEM DESCRIPTION

STEEL SHOT

The General Services Administration has authorized the use of this commercial item description in lieu of Military Specification MIL-S-851C.

This commercial item description covers hardened steel shot for general blasting and peening purposes.

Salient characteristics:

1. The steel shot shall be furnished in the following grades as specified:

Grade 1 - For peening.

Grade 2 - For blast cleaning.

Class A - Newly manufactured shot (grade 2).

Class B - New or used shot (grade 2).

All requirements specified in this commercial item description are applicable to grade 1 and grade 2 steel shot unless the requirement is specifically identified as being applicable to only grade 1 or grade 2.

2. Except for Grade 2, class B, the shot shall be newly manufactured from virgin or recovered raw materials. The shot shall be free of dust, grit, oil, grease, corrosion and other contaminants. Corroded or rusted shot shall be considered unacceptable.
3. The shot shall be furnished in sizes S930, S780, S660, S550, S460, S390, S330, S280, S230, S170, S110, and S70 as specified. Shot size shall be determined in accordance with the Society of Automotive Engineers Recommended Practice 'Cast Shot And Grit Size Specifications For Peening And Cleaning - SAE J444'.

4. Shot shall be as nearly spherical as is commercially possible. Physical characteristics and hardness shall conform with and be examined in accordance with Steel Founders' Society Of America 'Standard Specification for Cast Steel Abrasives', SFSA Designation: 20-66, Reprinted 1980 except that the hardness value shall be 40 to 52 on the Rockwell C scale. The applicable portions of SFSA 20-66 are paragraphs 4.3 through 6.3 and 7.3 through 7.5.4.1. Density of the shot shall be not less than 7.0 gm per cc and shall be determined by the displacement method described in the Society of Automotive Engineers Recommended Practice 'Cast Steel Shot - J827'.
5. The chemical composition of the cast steel shot shall conform with the following limitations and shall be determined in accordance with American Society For Testing And Materials 'Standard Methods For Chemical Analysis OF Carbon Steel, Low-alloy Steel, Silicon Electrical Steel, Ingot Iron, And Wrought Iron', ASTM E350:

Grade 1:

CARBON	-	0.85 to 1.20 %
MANGANESE	-	Shot sizes S70 & S110, 0.35% minimum Shot size S170, 0.50% minimum Shot sizes S230 & S280, 0.60% minimum Shot sizes S330 & larger, 0.70% to 1.20%
PHOSPHORUS	-	0.05 %, maximum
SULFUR	-	0.05 %, maximum
SILICON	-	0.40 to 1.50 %

Grade 2:

CARBON	-	1.20 %, maximum
MANGANESE	-	1.20 %, maximum
PHOSPHORUS	-	0.05 %, maximum
SULFUR	-	0.05 %, maximum
SILICON	-	1.50 %, maximum

SILICA SHALL NOT BE PRESENT IN THE FREE FORM AND PRESENT A HEALTH HAZARD DUE TO SILICOSIS.

6. The shot shall conform with the durability and transmitted energy requirements shown in Table I below (transmitted energy is applicable to grade 1 shot only):

TABLE I

Shot Size	Minimum Durability Cycles to Complete Breakdown	Take-out Screen Size	Minimum Arc Height 4/
S930*	2300	40 mesh	9.0A
S780*	2350	40 mesh	9.0A
S660	2450	40 mesh	9.0A
S550	2500	40 mesh	9.5A
S460	2375	40 mesh	9.0A
S390	2300	40 mesh	11.0A
S330	2900	50 mesh	7.0A
S280	3000	50 mesh	9.0A
S230	3000	50 mesh	9.0A
S170	3100	50 mesh	6.5A
S110*	*	*	*
S70*	*	*	*

* see footnote 5/

- 1/ Durability shall be tested in accordance with the Complete Breakdown method of Society Of Automotive Engineers Information Report, 'Metallic Shot And Grit Mechanical Testing', SAE J445.
- 2/ Transmitted energy shall be tested in accordance with Society Of Automotive Engineers Standard, 'Test Strip, Holder And Gage For Shot Peening', SAE J442, using test strip "A". The test strip shall be subjected to 40 passes for one test run using exactly 50.0 grams of shot carefully split from the operating mix remaining from the last 500 pass cycle of the durability test, 1/.
- 3/ Durability and transmitted energy tests shall be performed using an Ervin Industries, Inc. shot/grit test machine (3893 Research Park Drive, P.O. Box 1168, Ann Arbor, MI 48106) or equivalent apparatus properly calibrated in accordance with the manufacturer's instructions.
- 4/ Transmitted energy testing is required for grade 1 shot only.
- 5/ The shot sizes S70 & S110 in Table I above cannot be accurately tested due to limitations of the test apparatus in retaining these sizes. The values for shot sizes S930 and S780 are considered nominal due to lack of historical data and a tolerance of - 30% is permitted.

Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the contractor 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 that supplies and services conform to prescribed requirements.

Sampling. Samples for all product examinations, tests and analysis specified herein shall be selected in accordance with SFSA Designation 20-66 except that the inspection lot for sampling purposes shall be all shot of the same size presented for acceptance at one time. When certification of testing is specified in the contract or purchase order and stated conditions of certification are maintained, the lot size may be the manufacturer's standard production lot size.

Certification of durability, hardness, chemical composition and transmitted energy. When specified in the contract or purchase order, a certificate of conformance may be furnished in lieu of actual testing on a lot by lot basis providing that:

- (1) The manufacturer has objective evidence in the form of end-item test reports, dated not more than twelve (12) months prior to the start of the contract period showing conformance with all test requirements for each shot size to be furnished and records which indicate a continuous process control system. Process control checks shall be accomplished during the manufacturing process and shall be designed to assure that processes and procedures which have proven to produce product conforming with all end-item tests are being maintained. Such process controls shall be ongoing and current with the last production lot of shot produced.
- (2) Tests specified in this document or the specifications or standards referenced herein have been performed by the manufacturer or an independent test facility acceptable to the Government.
- (3) That the product being offered is the same size and quality and has been manufactured using the same material, processes and manufacturing techniques as the product tested.

The Government reserves the right to require complete testing on a lot-by-lot basis if evidence indicates that the product or products supplied during the term of the contract do not conform with stated requirements or if the above conditions do not exist or are not maintained.

The intent of this provision when provided for in the contract or purchase order is to permit the supplier to certify conformance with those product characteristics identified above without end-item testing each inspection lot for conformance with stated characteristics.

Preservation, packaging, packing, labeling, and marking. The preservation, packaging, packing, labeling, and marking shall be as specified in the contract or order.

Packaging (DOD). The packaging shall be in accordance with ASTM Standard D3951, 'Packaging, Commercial'.

Examination for preparation for delivery. A random sample of unit, intermediate and shipping containers (as applicable) shall be selected from each lot and examined for conformance with the preservation, packaging, packing, labeling and marking required in the contract or order. Samples shall be selected in accordance with Military Standard MIL-STD-105, "SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES", Inspection level II, AQL 6.5 expressed in terms of defects per hundred unit. For purposes of this examination, a lot shall be considered all shot presented for inspection at one time.

Regulatory requirements. In accordance with section 23.403 of the Federal Acquisition Regulations, the Government's policy is to acquire items composed of the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used products are allowed under this commercial item description unless otherwise specified.

Notes:

Purchaser should specify grade and class (if grade 2) and shot size and if certification of durability, harness, size, chemical composition and transmitted energy is acceptable in lieu of actual lot-by-lot examination.

The issue or revision of all documents referenced herein in effect on the date of the invitation for bids or request for quotation shall be used to determine compliance with these requirements.

SAE Standards are available from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15906.

Standard Specification for Cast Steel Abrasives, SFSA Designation 20-66 is available from the Steel Founders' Society Of America, Cast Metal Federation Building, 455 State Street, Des Plain, IL 60016.

ASTM standards are available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

Copies of MIL-STD-105 may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402

The commercial item certification clause is not required when this commercial item description is used for procurement.

MILITARY INTEREST:

PREPARING ACTIVITY

Review Activities:

GSA - FSS

Air Force - 84, 71

Navy - SH, OS

Army - MR