

MIL-P-270A**2 FEBRUARY 1959****SUPERSEDING****JAN-P-270****1 OCTOBER 1953**

MILITARY SPECIFICATION

PROPELLANT, ARTILLERY

This specification has been approved by the Department of Defense and is mandatory for use by the Departments of the Army, the Navy, and the Air Force.

1. SCOPE

1.1 Scope. This specification covers the basic requirements for all of the individual classes of smokeless cannon propellants. The requirements for the individual classes of smokeless propellants are covered in the corresponding detail specifications.

1.2 Classification. The propellant shall be of the following types as specified (see 6.2).

Type I Cylindrical multiple-perforated grains.

Type II Cylindrical single-perforated grains.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

MILITARY

MIL-G-2550 — General Specification for Ammunition except Small Arms Ammunition.

STANDARDS

MILITARY

MIL-STD-129 — Marking for shipment and storage.

MIL-STD-286 — Propellants: Sampling, Inspection and Testing.

DRAWINGS

ORDNANCE CORPS

20-4-77 — Marking of Packing Box, Chest for Packing, for Smokeless Powder for Cannon.

76-4-46 — Box, Packing for Metal Liner, for Smokeless Powder, Assembly and Details.

76-4-53 — Box, Steel, M2, for Smokeless Powder, Assembly.

76-4-56 — Box, Packing, Metal-Wood, M-17, for Smokeless Powder.

FSC 1375

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CP-24114 — 134.5°C.—Heat Test.

NAVY BUREAU OF ORDNANCE

138439 — Packing Box Mark VII for Smokeless Powders, General Arrangement.

138440 — Packing Box Mark VII for Smokeless Powders, Body Details.

138441 — Packing Box Mark VII for Smokeless Powders, Cover Details.

PUBLICATIONS**NAVY BUREAU OF ORDNANCE**

OP 400 — General Instructions for the Design, Manufacture and Inspection of Ordnance Material.

OS 666 — Powder, Propellant; U. S. Navy Ballistic Appendix.

(Copies of specifications, standards, drawings, and publications required by contractors 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 document forms a part of this specification. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

CODE OF FEDERAL REGULATIONS

49 CFR 71-90 — Transportation, Interstate Commerce Commission; Explosives and Other Dangerous Articles.

(The Interstate Commerce Commission regulations are now a part of the Code of Federal Regulations (1949 Edition—Revised 1956) available from the

Superintendent of Documents, Government Printing Office, Washington 25, D. C. Orders for the above publication should cite "49 CFR 71-90 (Rev. 1956)".)

3. REQUIREMENTS

3.1 Materials. The raw materials in the manufacture of smokeless propellant purchased under this specification shall conform to the requirements listed in the applicable detail propellant specification.

3.2 Grain dimensional requirements.**3.2.1 Forms of grains.**

3.2.1.1 Type I. The grain shall be cylindrical with 7 longitudinal perforations, 1 in the center of the grain and 6 at the vertices of a symmetrical hexagon.

3.2.1.2 Type II. The grain shall be cylindrical with a single longitudinal perforation through the center of the grain.

3.2.2 Dimensions of grain. The following requirements regarding grain dimensions shall govern unless authorization for departure is given by the procuring activity concerned prior to manufacture of the propellant.

3.2.2.1 Length-diameter ratio.

3.2.2.1.1 Type I. The average grain length (L) shall be from 2.10 to 2.50 times the average grain diameter (D).

3.2.2.1.2 Type II. The average grain length (L) shall be from 3.0 to 6.0 times the average grain diameter (D).

3.2.2.2 Length and diameter uniformity. The length and diameter of grain shall comply with the uniformity requirements shown in Table I.

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TABLE I. Standard deviation of individual dimensions expressed as a percentage of the mean dimension.

Dimensions	Maximum
L.	6.25
D (grains 0.2 inch or more in diameter)	3.125
D (grains less than 0.2 inch in diameter)	6.25

3.2.2.3 Grain diameter-perforation diameter ratio.

3.2.2.3.1 *Type I.* The average grain diameter (D) shall be from 5.0 to 15.0 times the average diameter of the perforations (d).

3.2.2.3.2 *Type II.* The average grain diameter (D) shall be approximately three times the average diameter of the perforation (d).

3.2.2.4 Web measurements.

3.2.2.4.1 *Type I.* The difference between the average outer web thickness (Wo) and the average inner web thickness (Wi) shall not exceed 15 percent of the average web thickness (Wa).

3.2.2.4.2 *Type II.* The standard deviation of the web measurements, expressed as a percent of the average web measurement, shall not be greater than 20 percent.

3.2.3 *Compressibility of grains.* Unless otherwise specified in the detail specification or by the procuring activity, when normal grains of type I propellant are subject to the pressure necessary to crack each grain, the average compression shall be not less than 30 percent.

3.3 *Ballistic requirements.* The propellant manufactured under this specification shall conform to the following ballistic requirements.

3.3.1 *Velocity.* The propellant shall satisfy the requirements for velocity level within the specified pressure limits when fired in the weapon for which it was manufactured,

as specified in table II.

3.3.2 *Velocity uniformity.* The propellant shall satisfy the requirement for velocity uniformity in the weapon for which it was manufactured as specified in table II.

3.3.3 *Pressure.* The average corrected pressure shall be within the range specified in table II.

3.3.4 *Excess charge.* Excess charge is defined as 105 percent of service charge or the charge required to give 100 ft/sec over prescribed velocity. The pressure obtained shall not be more than 120 percent of the pressure at service velocity or in any case more than the proof pressure for the specified gun. If the excess charge exceeds the weapon chamber capacity, the charge fired shall be as close to the above requirements as is practicable.

3.4 General requirements.

3.4.1 *Hygroscopicity.* The maximum hygroscopicity permitted shall be as specified in the applicable detail specification.

Note. Hygroscopicity is a function of composition; therefore tests it will not ordinarily be made as part of the tests under this specification.

3.4.2 Stability.

3.4.2.1 *134.5°C. heat test.* All single-base propellants submitted for acceptance shall be subjected to this test. The requirements may vary with the class of propellant and will be specified in the applicable detail specification.

3.4.2.2 *120°C. heat test.* All double-base propellants submitted for acceptance shall be subjected to this test. The requirements may vary with the class of propellant and will be specified in the applicable detail specification.

3.5 Description sheets. With every lot of

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propellant submitted for acceptance the contractor shall furnish, on official blanks, 8 copies of a description sheet giving a complete history of its manufacture and chemical and physical analysis.

3.6 Workmanship. The best commercial practices shall be used in the manufacture of propellant furnished under this specification, and all other applicable documents. The propellant and its standard ingredients shall be protected from the action of direct sunlight and acid fumes. The propellant shall not contain excessive quantities of cracked, distorted, short and long and otherwise deformed grains.

4. QUALITY ASSURANCE PROVISIONS**4.1 General quality assurance provisions.**

4.1.1 Contractor inspection. Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for Government inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examinations and tests shall be kept complete and available to the Government as specified in the contract or order.

4.1.2 Contractor quality assurance system. The contractor shall provide and maintain an effective quality assurance system acceptable to the Government covering the supplies under the contract. A current written description of the system shall be submitted to the contracting officer prior to initiation of production. The written description will be considered acceptable when, as a minimum, it provides the quality assurance required by the detail specification and other applicable documents referenced in the detail specification. The contractor will not be restricted to the inspection station or to the method of inspection listed provided

that an equivalent control is included in the approved quality assurance procedure. In cases of dispute as to whether or not certain procedures of the system provide equal assurance, the comparable procedure of the detail specification shall be used. The contractor shall notify the Government of and obtain approval for any change to the written procedure that might affect the degree of assurance required by the detail specification or other applicable documents referenced therein.

4.1.3 Government verification. All quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of (a) surveillance of the operations to determine that practices, methods, and procedures of the written inspection plan are being properly applied, and (b) Government product inspection to measure quality of product offered for acceptance. Deviation from the prescribed or agreed-upon procedures, or instances of poor practices which might have an effect upon the quality of the product, will be immediately called to the attention of the contractor. Failure of the contractor to promptly correct deficiencies discovered shall be cause of suspension of acceptance until correction has been made or until conformance of product to prescribed criteria has been demonstrated. To avoid interference with operations, the contractor shall designate a responsible official to whom the Government inspector will report such instances.

4.1.4 Inspection. Inspection shall be in accordance with MIL-G-2550 or Bureau of Ordnance Publication O. P. 400 as appropriate.

4.2 Lot. Unless otherwise specified, the following types of propellant shall be manufactured in lots of the sizes indicated.

4.2.1 Single-base propellant and double-base propellant containing nitro-guanidine.

4.2.1.1 Single-perforated. 50,000 pounds minimum; 550,000 pounds, maximum.

4.2.1.2 Multiperforated. 120,000 pounds, minimum; 550,000 pounds, maximum.

4.2.2 Double-base propellant, except those containing nitro-guanidine. 50,000 pounds, minimum; 165,000 pounds, maximum.

4.3 Sampling. The amount of propellant required to make up the ballistic sample and the chemical and stability sample shall be taken from containers selected so as to be representative of the lot.

4.3.1 Ballistic samples. The weight of the ballistic sample shall be as specified in table II. The method of selecting the sample shall be as specified. The ballistic sample may be taken as soon after packing as desired, except when moisture has been added to the propellant while in the blending tower, in which case the sample shall not be taken sooner than 48 hours after the time of packing.

4.3.2 Chemical and stability samples. From each of the containers sampled for the ballistic tests an equal portion of propellant shall be taken, so as to have a total weight for the chemical and stability tests as specified in table II. Portions of these original samples shall be set aside for the 134.5°C. heat test (see 4.4.3.2.1), or the 120°C. heat test (see 4.4.3.2.2), and the remainder blended thoroughly to form a composite chemical sample. Five pounds of the composite chemical sample shall be taken for the 65.5°C. surveillance tests (see 6.3) and forwarded in the case of Army purchases, to the Commanding Officer, Picatinny Arsenal, or in the case of Navy Department purchases, to the Supply Officer, Naval Propellant Plant, Indian Head, Maryland. The greatest possible cleanliness shall be observed in handling the chemical and stability samples, and touching them with damp or soiled hands shall be avoided.

4.3.3 Packing and marking of the samples. All samples shall be packed in airtight containers, preferably in glass jars if the samples are small, or in propellant boxes which have been tested and found airtight immediately before use. Each sample container shall be marked to show the propellant designation, lot number, manufacturer, contract number, number of pounds in the lot, and the number of the box from which the sample was taken.

4.4 Tests and test procedures. Unless otherwise specified in the contract or order, tests shall be made at a Government Laboratory in accordance with the following test procedures:

4.4.1 Dimensional tests.

4.4.1.1 Form of grain. Determine the form of grain by visual examination.

4.4.1.2 Dimension of grain.

4.4.1.2.1 Length. Thirty normal grains of propellant shall be selected at random and tested as specified in Method No. 504.1 in Military Standard, MIL-STD-286.

4.4.1.2.2 Grain diameter, perforation diameter and web thickness. Thirty normal grains of either single or multi-perforated propellant shall be selected at random and tested as specified in Method No. 504.1 in Military Standard, MIL-STD-286.

4.4.1.2.3 Length-diameter ratio. See Method No. 504.1 Military Standard, MIL-STD-286.

4.4.1.2.4 Length and diameter uniformity. From the measurements of length and grain diameter made as described in 4.4.1.2.1 and 4.4.1.2.2, calculate the standard deviation of the individual dimensions expressed as a percentage of the mean deviation.

4.4.1.2.5 Grain diameter-perforation di-

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ameter ratio. See Method No. 504.1 in Military Standard, MIL-STD-286.

4.4.1.2.6 *Web measurements.*

4.4.1.2.6.1 *Type I.* See method No. 504.1 in Military Standard, MIL-STD-286.

4.4.1.2.6.2 *Type II.* From the measurements made as described in 4.4.1.2.2, calculate the average and the standard deviation of the 60 web thicknesses. Calculate as percentage, the ratio of the standard deviation to the average thickness (Wa).

4.4.1.3 *Compressibility of grains.* See Method No. 505.1 Military Standard, MIL-STD-286.

4.4.2 *Ballistic tests.* Compliance with the specified ballistic requirements (see 3.3) shall be determined by the procedures set forth hereafter.

4.4.2.1 *Velocity.* From charge-velocity and charge-pressure relations representing actual firing data, determine the weight of charge to give the required velocity. Using this weight of charge and the specified projectiles, fire a uniformity series as indicated in table II.

4.4.2.2 *Velocity uniformity.* Calculate the maximum variation in velocity obtained in firing the series specified in 4.4.2.1.

4.4.2.3 *Pressure.* Calculate the mean pressure for the uniformity series specified. Correct this pressure to the corresponding pressure at service velocity.

4.4.2.4 *Excess charge.* Excess charge rounds shall be fired in accordance with applicable proof directives. The method for determining the excess charge weight is specified in 3.3.4.

4.4.3 *General tests.*

4.4.3.1 *Hygroscopicity.* If this is required,

use Method No. 503.2.1 in Military Standard, MIL-STD-286.

4.4.3.2 *Stability.*

4.4.3.2.1 *134.5°C. Heat test.* Make one determination, as follows, on each of 5 of the original samples selected as specified in 4.3. Weigh out 2.5 gm. of sample and place each specimen in a test tube made of heavy glass, preferably pyrex, measuring approximately 15 mm. inside diameter, 18 mm. outside diameter, and 290 mm. in length. Each specimen shall consist of as nearly whole grains as is consistent with a weight of 2.5 gm. of specimen. In sectioning grains to obtain the required weight, split the grains longitudinally. Place a piece of standard normal methyl violet paper, 70 mm. long and 20 mm. wide, vertically in each tube, its lower edge 25 mm. above the propellant. Stopper the tubes with corks through which holes 4 mm. in diameter have been bored. Place the tubes in a constant temperature bath at $134.5^{\circ} + 0.5^{\circ}\text{C}$. (see U. S. Army Ordnance Department Drawing CP-24114) so that no more than 6 or 7 mm. of length projects. Examine each tube by withdrawing about one-half of its length and replacing quickly at 5-minute intervals beginning 5 minutes before the minimum time specified in the detail specification for the appearance of a salmon-pink color. Record as the time of completion of the test, the time of that observation which reveals the test paper in any tube to be completely changed to a salmon-pink color. Continue heating and report whether any sample of propellant explodes in less than 5 hours. (Secure standard normal methyl violet paper from the Army Ordnance Corps, or from the Naval Propellant Plant Indian Head, Maryland.)

4.4.3.2.2 *120°C. Heat test.* Conduct heat tests on double-base propellants in accordance with 4.4.3.2.1, with the exception that the constant temperature bath shall be $120^{\circ}\text{C} + 0.5^{\circ}\text{C}$. instead of $134.5^{\circ}\text{C} + 0.5^{\circ}\text{C}$., and the test is to be discontinued after the

salmon-pink end-point has been obtained.

4.4.4 Other tests. Procedures for conducting other tests for specific classes of propellant shall be as specified in the detail specification.

4.4.5 Acceptance, rejection, and retest. A lot shall be considered acceptable if it satisfied the requirements of the applicable detail specification, and if it satisfied the requirements of section 3 herein when tested in accordance with section 4. If a lot does not satisfy the dimensional requirements (see 3.2), it shall be rejected, but it may be offered for retest provided that the inspector is satisfied that the defective portions of the lot have been screened out. If a lot does not satisfy the ballistic and general requirements (see 3.3 and 3.4), it shall be rejected, but with the approval of the procuring activity, it may be retested only once.

5. PREPARATION FOR DELIVERY

5.1 Packing.

5.1.1 Level A. Propellant procured under this specification shall be packed in boxes conforming to Ordnance Corps Drawings 76-4-46, 76-4-53, or 76-4-56, or to Bureau of Ordnance Drawings 138439, 138440, and 138441, as specified in the contract or order (see 6.2). Immediately prior to packing, all containers shall be tested with compressed air, at an internal pressure of $\frac{1}{2}$ to 1 p.s.i. for containers conforming to Drawing 76-4-56, and of 2 to 3 p.s.i. for all other containers. The containers shall withstand the applicable specified pressure for 15 seconds without leakage.

5.2 Marking. In addition to any special marking required by the contract or order, the boxes shall be marked in accordance with Ordnance Corps Drawings 20-4-77, Standard MIL-STD-129, and ICC Regulations as stipulated in the Code of Federal Regulations 49 CFR 71 90.

6. NOTES

6.1 Intended use. The smokeless propellant, covered by this specification, is intended for use as a propellant charge for cannon.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type of propellant.
- (c) Ballistic requirements applicable (see 3.3).
- (d) Packing requirements.
- (e) Special markings required, if any (see 5.2).

6.3 The 65.5°C. surveillance tests are for information only.

6.4 In case the propellant fails pass the ballistic tests in the weapon for which it was intended, the bureau or activity concerned may, if deemed to its interest, accept the propellant, provided it meets the specification of the bureau or activity concerned for any other weapon.

6.5 Provisions of this specification are the subject of international standardization agreements. 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.

Notice. When Government drawings, specification, 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 other-

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wise 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:

Army—Ordnance Corps

Navy—Bureau of Ordnance

International interest (see section 6)

Preparing activity:

Army—Ordnance Corps

TABLE II PART 1. Ballistic requirements army weapons.

Weapon and model	Drawing Number of Projectile to be used for propellant acceptance firings	Weight of projectile (lbs.)	Prescribed velocity (ft/s)	Maximum permitted velocity variation (percent of prescribed velocity)	Rated maximum pressure (p.s.i.)	Lower acceptable mean pressure	Number of rounds in uniformity series	Number of excess charge rounds	Weight of ballistic sample (lbs.)	Weight of chemical and stability sample (lbs.)
40 mm Gun	75-2-298	1.96	2870	2.0	40000	35000	7	2	10	10
M1, M1A1, M2, & M2A1	75-2-311	1.96	2870	2.0	40000	36000	7	2	10	5
57 mm Rifle M18	75-2-359	2.75	1200	3.0	6500	4000	7	...	21	5
75 mm Gun:										
M3, M6, & M17	P-83219	8.71	2400	2.0	1030000	...	7	2	49	5
Do	75-2-291	14.90	2000	1.5	1036000	33000	7	2	30	5
Do	75-2-269	14.70	950	3.0	36000	9000	7	2	8	5
Do	75-2-269	14.70	1500	2.0	36000	22000	7	2	20	5
Do	75-2-269	14.70	1950	1.5	36000	31000	7	2	80	5
T83E1	75-2-432	12.21	2800	1.5	1040000	36000	7	2	70	5
75 mm Rifle	75-2-365	14.40	990	3.0	9000	5000	7	...	63	5
M20	75-2-366	13.10	1000	3.0	9000	5000	7	...	63	5
	75-2-367	15.10	990	3.0	9000	5000	7	...	63	5
	P-83205	8.60	1400	3.0	9000	5000	7	...	70	5
75 mm Howitzer M1A1:										
M3	75-2-314	13.10	1000	1.5	1024000	18000	7	2	10	5
Do	75-2-269	14.70	1250	1.5	29000	24000	7	2	20	5
76 mm Gun M1A1C:										
M1A2	75-2-292	15.40	2600	1.5	43000	37000	7	2	70	5
Do	75-18-33	12.80	¹² 2700	1.5	43000	30000	7	2	70	5
Do	75-18-33	12.80	¹³ 1550	1.5	43000	30000	7	2	70	5
Do	75-2-367	12.80	2700	1.5	43000	30000	7	2	70	5
Do	75-2-361	9.30	3400	1.5	43000	37000	7	2	70	5
Do	75-2-390	9.30	3400	1.5	43000	37000	7	2	70	5
Do	P-82591	14.60	2700	1.5	43000	37000	7	2	70	10
Do	75-2-434	15.00	2400	1.5	1036000	23500	7	2	70	5
M82	P-82082	8.22	4125	2.0	46000	40000	7	2	136	5
Do	P-81976	14.50	3200	1.5	46000	43000	7	2	100	5
Do	75-2-440	7.00	4135	1.5	46000	43000	7	2	100	5
Do	75-2-566	15.71	2400	1.5	1036000	23500	7	2	70	5

* See footnote at end of table.

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TABLE II PART I. Ballistic requirements army weapons. --Continued

Weapon and model	Drawing Number of Projectile to be used for propellant acceptance firings	Weight of projectile (lbs.)	Prescribed velocity (ft/s)	Maximum permitted velocity variation (percent of prescribed velocity)	Rated maximum pressure (D.S.I.)	Lower acceptable mean pressure	Number of rounds in unit-formity series	Number of excess charge rounds	Weight of ballistic sample (lbs.)	Weight of chemical and stability sample (lbs.)
90 mm Gun:										
M1 Series	75-2-388	24.10	3000	1.5	41500	38500	7	2	120	5
Do	75-2-375	16.75	3350	1.0	41500	38500	7	2	120	5
Do	75-2-408	16.75	3350	1.0	41500	38500	7	2	120	5
Do	75-18-46	24.10	2800	1.5	41500	38500	7	2	150	5
Do	75-2-479	12.44	3825	1.5	41500	36000	7	2	150	5
Do	75-2-572	23.29	2870	2.0	41500	36000	7	2	150	5
Do	P-82710	17.20	2600	1.5	1030000	25000	7	2	120	5
Do	75-18-42	23.40	2700	1.0	38000	34000	7	2	150	5
M36, M41	P-81675	18.50	2400	1.5	1030000	25000	7	2	120	5
Do	P-83398	24.10	3000	2.0	47000	38000	7	2	120	5
Do	75-2-575	14.40	2800	1.5	1030000	21500	7	2	135	5
All Guns	75-2-489	16.00	2600	1.5	1031000	21000	7	2	75	5
105 mm Rifle:										
M27	75-4-174	32.40	1120	3.0	10000	7000	7	...	160	5
Do	75-4-175	29.30	1250	3.0	10000	7000	7	...	160	5
Do	75-4-176	34.50	1120	3.0	10000	7000	7	...	160	5
Do	75-4-189	25.50	1265	3.0	10000	7000	7	...	160	5
Do	75-14-661	17.30	1650	3.0	10000	7000	7	...	160	5
Do	75-14-667	17.54	1690	3.0	10000	7000	7	...	160	5
105 mm Howitzer M2A1:										
M4	75-4-75	33.00	11550	1.5	32500	26000	7	2	975	5
Do	75-4-128	36.55	11550	1.5	32500	26000	7	2	975	5
Do	75-4-106	28.80	1250	1.0	1026000	22000	7	2	80	5
Do	P-82708	23.50	2111	1.5	1026000	27500	7	2	75	5
Do	WB-2501	24.00	1750	1.5	1025000	17500	7	2	90	5
106 mm Rifle:										
M40	75-14-664	17.55	1650	3.0	9300	...	7	...	160	5
Do	75-14-666	17.54	1635	3.0	9300	...	7	...	160	5

* See footnotes at end of table.

TABLE II PART 1. Ballistic requirements army weapons. --Continued

Weapon and model	Drawing Number of Projectile to be used for propellant acceptance firings	Weight of projectile (lbs.)	Prescribed velocity (f/s)	Maximum permitted velocity variation (percent of prescribed velocity)	Rated maximum pressure (p.s.i.)	Lower acceptable mean pressure	Number of rounds in uniformity series	Number of excess charge rounds	¹¹ Weight of ballistic sample (lbs.)	Weight of chemical and stability sample (lbs.)
120 mm Gun:										
M1	75-18-40	50.00	3100	1.5	38000	34000	7	2	350	5
T123	75-4-172	50.40	2500	1.5	1037500	33000	7	2	175	5
M58(T123)	8593614	50.85	3500	2.0	45000	...	7	2	990	10
155 mm Gun:										
M2	75-4-80	95.00	12800	1.5	40000	35000	7	2	350	5
155 mm Howitzer M1:	75-4-99	95.0	41200	1.0	32000	19000	7	2	120	5
Do	75-4-99	95.0	1850	1.5	32000	28000	7	2	275	5
165 mm Gun M57	P-87701	1162.5	850	1.3	40000	34000	5	2	25	10
8-inch Gun M1	75-4-87	240.0	2850	1.0	38000	33000	4	1	1000	5
8-inch Howitzer:										
M2	75-4-76	200.0	21380	1.0	33000	26000	4	1	182	5
Do	75-4-76	200.0	1950	1.0	33000	29000	4	1	329	5
240 mm Howitzer M1 ..	75-4-92	360.0	2300	1.0	36000	31000	4	1	800	5
280 mm Gun T131	P-84805	800	2050	2.0	36000	30000	4	...	1700	5
Do	P-81725	600	2500	1.5	36000	32000	4	...	1600	5

¹ Super Charge.² M1 Charge.³ M2 Charge.⁴ M3 Charge.⁵ M4A1 Charge.⁶ M13 Charge.⁷ Dualgram charges 1 and 2, SP propellant; charges 3 through 7, MP propellant.⁸ Dualgram charges 1 through 3, SP propellant; charges 3 through 7, MP propellant.⁹ Dualgram charges require two granulations.¹⁰ Maximum allowable pressure for projectile.¹¹ Include cartridge case and primer.¹² M6 propellant.¹³ M1 propellant.¹⁴ If the weight of the sample required is less than 7 full containers, a portion equal to one-seventh of the weight of the required ballistic sample shall be removed from each of 7 boxes. These 7 portions shall be packed in individual airtight containers.

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TABLE II, PART 2, Ballistic requirements, naval weapons
(Current List)

Gun Mk Number	Propellant composition type	Projectile Mk Number	Nominal velocity ft./sec.	Charge type	Pressure			Velocity std. dev. ft./sec.	Charge		Ballistic ¹ sample weight lbs.	Chemical and stability sample weight (lbs.)
					Max. psi	Min. psi	Std. dev. psi		Max. lbs.	Min. lbs.		
Case guns												
20 mm Mk 4.	SPDN	3	2770	Full	22.0	19.7	1.8	28	.0631	.0589	48	10
40 mm Mk 1	SPDN	22	2890	Full	19.5	17.5	1.0	21	.690	.630	100	10
3"/50 Mk 21, 22	SPDN, SPDN	M81 27, 33	2890 2700	Special Full	19.5 17.0	17.5 15.0	1.0 .50	21 16	.700 4.30	.640 3.85	100 220	10
3"/70 Mk 26.	SPDF	27, 33	2700	Full	17.0	15.0	.50	16	4.35	3.90	220	10
5"/25 Mk 13, 17.	SPCG	27, 33	2700	Full	17.0	15.0	.50	16	4.45	4.00	220	10
5"/38 Mk 12-1.	SPCG	34	3400	Full	22.5	20.5	.75	15	10.4	10.0	760	10
5"/54 Mk 16, 18.	SPD, SPDN	36	2110	Full	16.7	15.2	.50	14	10.2	9.2	220	10
6"/47 Mk 16.	SPD, SPDN	35	2600	Full	18.0	16.0	.50	16	16.0	14.5	660	10
6"/56 Mk 16.	SPDF	35	2600	Full	18.0	16.0	.50	16	17.0	15.0	660	10
6"/56 Mk 16.	SPDN ^a	35	1200	Reduced	7.0	4.8	.25	8	3.75	3.50	660	10
6"/56 Mk 16.	SPDN ^a	35	1200	Reduced	7.0	4.8	.25	8	3.60	3.40	660	10
6"/56 Mk 16, 18.	SPD, SPDN	41	2650	Full	20.5	18.5	.63	13	19.5	17.5	440	10
6"/47 Mk 16.	SPDF	41	2650	Full	20.5	18.5	.63	13	19.3	17.8	440	10
6"/56 Mk 16.	SPC, SPCF	41	2650	Full	20.5	18.5	.63	13	19.3	17.8	440	10
6"/47 Mk 16.	SPD, SPDN	36	2500	Full	18.5	16.5	.56	15	34.5	31.0	440	10
6"/56 Mk 16.	SPCG	36	2500	Full	18.5	16.5	.56	15	35.5	32.5	440	10
6"/56 Mk 16.	SPDN	34	2225	Reduced	14.0	11.5	.56	14	22.5	20.5	440	10
6"/56 Mk 16.	SPDF	34	2225	Reduced	14.0	11.5	.56	14	23.5	21.5	440	10
8"/55 Mk 16.	SPD, SPDE, SPDN	22	2500	Full	19.0	17.5	.63	10	79.0	73.0	2400	10
8"/56 Mk 16.	SPCG	22	2500	Full	19.0	17.5	.63	10	85.0	79.0	2400	10
8"/56 Mk 16.	SPDF	22	2500	Full	19.0	17.5	.63	10	83.0	75.0	2400	10
8"/56 Mk 16.	SPDN	24	2220	Reduced	17.0	14.5	.63	9	46.0	43.5	2400	10
8"/56 Mk 16.	SPDF	24	2220	Reduced	17.0	14.5	.63	9	48.5	46.0	2400	10

See footnote at end of table.

TABLE II, PART 2, Ballistic requirements, naval weapons—Continued
(Current List)

Gun Mk Number	Propellant composition type	Projectile Mk Number	Nominal velocity ft./sec.	Charge type	Pressure			Velocity std. dev. ft./sec.	Charge Weight		Ballistic ¹ sample weight lbs.	Chemical and ¹ stability sample weight (lbs.)
					Max. psi	Min. psi	Std. dev. psi		Max. lbs.	Min. lbs.		
(Bag guns)												
8"/55 Mk 12, 14 15.	SPD	18	2800	Full	17.0	15.5	.56	18	92	85	7200	10
	SPCG	18	2800	Full	18.2	16.7	.56	18	96	88	7200	10
	SPD	18	2300	Reduced		Note 3					7200	10
	SPCG	18	2300	Reduced		Note 3					7200	10
	SPD	22	2500	Full	18.2	16.7	.56	13	88	81	7200	10
	SPCG	22	2500	Full	18.2	16.7	.56	13	95	87	7200	10
	SPDN	24	2220	Reduced	14.0	11.5	.56	9	56	53	7200	10
	SPDF	24	2220	Reduced	14.0	11.5	.56	9	57	54	7200	10
12"/50 Mk 8.	SPD	24	2220	Reduced	14.0	11.5	.56	9	51.5	48.5	7200	10
	SPD	19	2500	Full	19.0	17.5	.56	10	282	262	7200	20
	SPCG	19	2500	Full	19.0	17.5	.56	10	333	313	7200	20
	SPD	19	2300	Special		Note 3					7200	20
	SPCG	19	2300	Special		Note 3					7200	20
	SPDN	17	1965	Reduced	15.5	13.5	.56	9	136	129	7200	20
	SPDF	17	1965	Reduced	15.5	13.5	.56	9	138.5	131.5	7200	20
	SPD	17	2700	Full	18.0	16.5	.56	11	438	400	8000	20
14"/50 Mk 11.	SPCG	17	2700	Full	18.0	16.5	.56	11	475	435	8000	20
	SPDN	19	2065	Reduced	13.5	11.0	.56	9	198	188	8000	20
	SPCG	19	2065	Reduced	13.5	11.0	.56	9	206	194	8000	20
	SPD	6	2300	Full	18.0	16.5	.56	10	560	515 ⁴	9000	20
	SPCG	6	2300	Full	18.0	16.5	.56	10	600	555 ⁴	9000	20
	SPD, SPDN	13	2075	Reduced	14.5	12.0	.56	9	302	286 ⁴	9000	20
	SPCG	13	2075	Reduced	14.5	12.0	.56	9	325	308 ⁴	9000	20
	SPD	9	2520	Full	18.5	17.0	.56	10	550	505 ⁵	9000	20
16"/45 Mk 6, 8.	SPCG	9	2520	Full	18.5	17.0	.56	10	585	540 ⁵	9000	20
	SPD, SPDN	13	2075	Reduced	14.5	12.0	.56	9	302	286 ⁵	9000	20
	SPCG	13	2075	Reduced	14.5	12.0	.56	9	325	308 ⁵	9000	20
	SPD	9	2500	Full	18.5	17.0	.56	10	690	630	11000	25
	SPCG	9	2500	Full	18.5	17.0	.56	10	770	700	11000	25
	SPD, SPDN	13	2075	Reduced	13.5	11.0	.56	9	312	296	11000	25
	SPCG	13	2075	Reduced	13.5	11.0	.56	9	335	318	11000	25
	16"/50 Mk 7.	SPD	9	2500	Full	18.5	17.0	.56	10	690	630	11000
SPCG		9	2500	Full	18.5	17.0	.56	10	770	700	11000	25
SPD, SPDN		13	2075	Reduced	13.5	11.0	.56	9	312	296	11000	25
SPCG		13	2075	Reduced	13.5	11.0	.56	9	335	318	11000	25

See footnote at end of table.

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TABLE II, PART 2, Ballistic requirements, naval weapons—Continued
(Current List)

Gun Mk Number	Propellant composition type	Projectile Mk Number	Nominal velocity ft./sec.	Charge type	Pressure			Velocity std. dev. ft./sec.	Charge Weight		Ballistic ¹ sample weight lbs.	Chemical and ¹ stability sample weight (lbs.)
					Max. psi	Min. psi	Std. dev. psi		Max. lbs.	Min. lbs.		
Case guns												
1" Mk 1	SPDN	2	2700	Full	18.0	15.5	1.00	34	.273	.251	1.5	10
1 Pdr.	SPD, SPDN	2	2000	Full	12.5	10.0	.50	15	.160	.140	1	10
Mk 5, 8, 13.												
3 Pdr.	SPD, SPDN	2	2200	Full	13.8	12.0	.50	14	.700	.630	4	10
Mk 4, 10.												
6 Pdr.	SPD, SPDN	3	2240	Full	14.0	12.5	.50	14	1.15	1.05	6	10
Mk 8, 11.												
3"/33	SPD, SPDN	26	1650	Full	13.0	11.5	.50	14	1.32	1.19	8	10
Mk 14.												
4"/50	SPD	15, 16	2900	Full	17.0	15.5	.63	18	15.00	13.75	560	10
Mk 9	SPDN	15, 16	2900	Full	17.0	15.5	.63	18	15.75	14.30	560	10
Mods 5	SPDF	15, 16	2900	Full	17.0	15.5	.63	18	15.75	14.30 ^a	560	10
thru 24	SPDF	15, 16	2900	Full	17.0	15.5	.63	18	17.50	15.90 ⁷	560	10
5"/51	SPD, SPDN	15, 14	3150	Full	17.0	15.5	.56	19	26.0	23.0	1080	10
Mk 9	SPDF	15, 14	3150	Full	17.0	15.5	.56	19	28.0	25.0	1080	10
Mod 6, 7, 8	SPD, SPDN	15, 14	2300	Reduced		Note 3					1080	10
	SPDF	15, 14	2300	Reduced		Note 3					1080	10
Bag gun												
5"/50	SPD, SPDN	15, 14	3000	Full	16.5	15.0	.56	19	21.75	20.25	840	10
Mk 5												
Mod 1, 2, 3												
Mk 6												
Mod 0, 2												
5"/51	SPD, SPDN	15, 14	3150	Full	17.0	15.5	.56	19	26	23	1080	10
Mk 15	SPDF	15, 14	3150	Full	17.0	15.5	.56	19	27	24	1080	10
	SPD, SPDN	15, 14	2300	Reduced		Note 3					1080	10
	SPDF	15, 14	2300	Reduced		Note 3					1080	10
6"/47	SPD, SPDN	29	2800	Full	18.5	16.5	.56	18	35	32	1360	10
Mk 17	SPCG	29	2800	Full	18.5	16.5	.56	18	37	34	1360	10
	SPD, SPDN	29	2300	Reduced		Note 3					1360	10
	SPCG	29	2300	Reduced		Note 3					1360	10

See footnote at end of table.

TABLE II, PART 2, *Ballistic requirements, naval weapons*—Continued
(Current List)

Gun Mk Number	Propellant composition type	Projectile Mk Number	Nominal velocity ft./sec.	Charge type	Pressure			Velocity std. dev. ft./sec.	Charge Weight		Ballistic ¹ sample weight lbs.	Chemical and ¹ stability sample weight (lbs.)
					Max. psi	Min. psi	Std. dev. psi		Max. lbs.	Min. lbs.		
(Bag guns)												
6"/50 Mk 8 Mk 8-2	SPD, SPDN	20	2800	Full	17.0	15.5	.56	18	40	36	1560	10
	SPD, SPDN	20	2100	Reduced	Note 3						1560	10
6"/53 Mk 12, 14, 18	SPD, SPDN	29	3000	Full	17.5	16.0	.56	19	45	42	1760	10
	SPCG	29	3000	Full	17.5	16.0	.56	19	48	44.5	1760	10
	SPD, SPDN	29	2300	Reduced	Note 3						1760	10
	SPCG	29	2300	Reduced	Note 3						1760	10
7"/45 Mk 2	SPD	11	2700	Full	17.0	15.5	.56	16	60	55	2320	10
12"/50 Mk 7 Mods 15 thru 18	SPD	15	2900	Full	17.5	16.0	.56	18	345	320	7200	20
	SPD	16	2125	Reduced	8.0	6.5	.50	13	225	210	7200	20
14"/45 Mk 12	SPD	17	2600	Full	18.0	16.5	.56	11	438	400	8000	20
	SPCG	17	2600	Full	18.0	16.5	.56	11	475	435	8000	20
	SPDN	19	2065	Reduced	14.0	11.5	.56	9	209	199	8000	20
	SPCG	19	2065	Reduced	14.0	11.5	.56	9	217	205	8000	20

¹ The weight of the ballistic sample may be changed but will not be more than 40 times the single round charge weight. At least one full box shall be supplied from each section. The surveillance sample shall be taken from the ballistic sample, an equal quantity being taken from each box.

² Mk 11 Tracers are used.

³ Acceptability is based entirely upon acceptability as full charges on preceding lines.

⁴ Five section charge.

⁵ Six section charge.

⁶ Powder, cannon, smokeless, or pyro, with flashless ingredients incorporated.

⁷ Powder, cannon, smokeless, M1 or M6, with flashless ingredients incorporated.

⁸ 40mm granulation.

⁹ 1" granulation.

SPECIFICATION ANALYSIS SHEET			Form Approved Budget Bureau No. 119-R004
<p style="text-align: center;">INSTRUCTIONS</p> <p>This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).</p>			
SPECIFICATION			
ORGANIZATION (Of submitter)		CITY AND STATE	
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$	
MATERIAL PROCURED UNDER A			
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT			
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.			
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.			
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID			
3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?			
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)			
SUBMITTED BY (Printed or typed name and activity)			DATE

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