

MIL-Q-378B

30 AUGUST 1963

SUPERSEDING

MIL-Q-00378A

31 JANUARY 1963

MILITARY SPECIFICATION**QUICKMATCH**

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 Quickmatch for use in igniting flares and signals.

1.2 Classification. Quickmatch shall be of the following types and classes (see 6.2):

- Type I Four—strand.
Class A Mealed.
Class B Unmealed.
- Type II Six—strand.
Class A Mealed.
Class B Unmealed.
- Type III Four—strand intertwined
with annealed copper wire
0.0142 inch diameter.
Class A Mealed.
Class B Unmealed.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS**FEDERAL**

- RR-S-366 —Sieves; Standard, Testing.
- CCC-T-191—Textile Test Methods.

MILITARY

- MIL-P-156—Potassium Nitrate.

JAN-C-178—Charcoal (For Use in Ammunition).

JAN-S-487—Sulfur, Ground (For Use in Ammunition).

STANDARDS**MILITARY**

- MIL-STD-105 —Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-109 —Quality Assurance Terms and Definitions.
- MIL-STD-129 —Marking for Shipment and Storage.
- MIL-STD-1235—Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes.

(Copies of specifications, standards, drawings 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 document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

FSC 1370

MIL-Q-378B**CODE OF FEDERAL REGULATIONS**

**49 CFR 71-90—Interstate Commerce
Commission Rules
and Regulations for
the Transportation of
Explosives and Other
Dangerous Articles.**

(The Interstate Commerce Commission Regulations are now a part of the Code of Federal Regulations (1949 Edition and revisions) available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Orders for the above publication should cite "49 CFR 71-90 (latest revisions)".)

3. REQUIREMENTS**3.1 Material.**

3.1.1 Black powder. The constituent materials shall comply with the requirements of the applicable specifications as follows:

Constituent material	Conforming to specification
Potassium nitrate	MIL-P-156
Charcoal	JAN-C-178
Sulfur	JAN-S-487

3.1.1.1 Composition. The black powder shall be of the following composition (see 6.4):

Ingredient	Percent (approximately)
Potassium nitrate	74.0
Charcoal	15.8
Sulfur	10.4

¹Tolerances on this composition shall be such as to produce Quickmatch conforming to the burning time, straightness and rigidity requirements of this specification.

3.1.1.2 Granulation. The black powder for coating mealed Quickmatch shall pass through a number 140 U.S. Standard sieve conforming to the requirements of Specification RR-S-366.

3.1.2 Cotton wick. The cotton wick shall be two-ply cotton strand cotton wick with a minimum breaking strength of 900 grams and shall weigh a minimum of .352 ounces per 100 linear yard when tested as specified in 4.3.3.

3.2 Straightness and rigidity. The pieces of Quickmatch shall be straight (free from kinks and not bowed more than 0.25 inch per foot) and rigid (deflection not more than 4.0 inches) when determined as specified in 4.3.1.

3.3 Burning time. The entire length of each sample piece of Quickmatch shall burn within the time specified in Table I.

TABLE I. *Burning time.*

Type	Class	Burning time maximum seconds
I	A	8
	B	12
II	A	10
	B	17
III	A	8
	B	12

3.4 Length. The length shall be specified in the contract or purchase order (see 6.2).

4. QUALITY ASSURANCE PROVISIONS

4.1 General quality assurance provisions. 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 or any other inspection facilities and services 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. 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. Reference shall be made to Standard MIL-STD-109 in order to define the terms used herein. Inspection shall be performed in accordance with this specification and any referenced in any of the contractual documents.

4.1.1 Contractor quality assurance system. If the contractor desires to utilize a quality assurance system, which is at variance with the quality assurance provisions of 4.2 and

4.3 and other documents referenced herein, he shall submit a written description of the system to the contracting officer for approval prior to initiation of production. It shall include a description covering controls for lot formation and identification, inspections to be performed, inspection stations, sampling procedures, methods of inspection, (measuring and testing equipment), and provisions for control and disposition of nonconforming material. The written description will be considered acceptable when, as a minimum, it provides the quality assurance provisions required by the provisions of 4.2 and 4.3 and the other documents referenced herein. The contractor shall not be restricted to the inspection station or the method of inspection listed in this specification provided that an equivalent control is included in the approved quality assurance procedure. In cases of dispute as to whether certain procedures of contractor's system provide equal assurance, the comparable procedure of this specification shall apply. The contractor shall notify the Government of, and obtain approval for, any changes to the written procedure that effects the degree of assurance required by this specification or other documents referenced herein.

4.1.2 Submission of product. At the time the completed lot of product is submitted to the Government for acceptance, the contractor shall supply the following information accompanied by a certificate which attests that the information provided is correct and applicable to the product being submitted:

- (a) A statement that the lot complies with all quality assurance provisions of the approved current written description of the system.
- (b) Quality of product submitted.
- (c) Results obtained for all inspection performed.
- (d) Specification number and date, together with an identification and date of changes.
- (e) Certificate of analysis on all ma-

terial procured directly by the contractor when such material is controlled by government specifications.

- (f) Quantity of product in the lot.
- (g) Date submitted.

The certificate shall be signed by a responsible agent of the certifying organization. The initial certificate submitted shall be substantiated by evidence of the agent's authority to bind his principal. Substantiation of the agent's authority will not be required with subsequent certificates unless, during the course of the contract, this authority is vested in another agent of the certifying organization.

4.1.3 Government verification. Using the contractor's written quality assurance procedure (see 4.1.1) this detail specification, and other contractual documents as a guide, the Government shall verify all quality assurance operations performed by the contractor. Verification shall be in accordance with (a) or (b) as applicable, the decision being the responsibility of the procuring activity. In either case, the inspector shall also ascertain prior to acceptance, that all quality provisions of other specifications referenced in any of the contractual documents have been complied with. Deviations from prescribed or agreed upon procedures discovered by the Government inspector shall be brought to the attention of the supplier. Disposition of the product and remedial action shall be as directed by the Government inspector and, depending on the nature of the deviation, may consist of lot rejection, screening, resampling, re-instruction of the supplier's employees, or other appropriate action:

- (a) Verification at the point of manufacture shall be accomplished at unscheduled intervals in accordance with 4.1.3.1 and 4.1.
- (b) Verification at the point of delivery shall be in accordance with 4.1.

4.1.3.1 Surveillance. Surveillance shall include, but is not limited to:

- (a) Observation of procedure concerning lot formation and identification.
- (b) Observation of sampling procedures and application of acceptance criteria.
- (c) Determination that all required examinations and tests are performed in accordance with the prescribed procedures of this specification, or approved equivalent thereto.
- (d) Review of procedures for control and disposition of nonconforming material.

4.2 Inspection provisions.

4.2.1 Lot formation. A lot shall consist of one or more batches of Quickmatch, produced by one manufacturer, in accordance with the same specification, or same specification revision, under one continuous set of operating conditions. Each batch shall consist of that quantity of Quickmatch that has been subjected to the same unit chemical or physical process intended to make the final product homogeneous.

4.2.2 Examination. Sampling plans and procedures for the following classifications of defects shall be in accordance with Standard MIL-STD-105 except that inspection for critical defects, when listed, shall be 100 percent. Continuous sampling plans in accordance with Standard MIL-STD-1235 may be used if approved by the procuring activity. Also, at the option of the procuring activity, AQL's and sampling plans may be applied to the individual characteristics listed using an AQL of 0.25 percent for each major defect and an AQL of 0.40 percent for each minor defect.

4.2.2.1 Quickmatch prior to packing.

Categories	Defects	Method of inspection	Code No. (see 6.3)
Critical: None defined.			
Major: AQL 0.40 percent			
101.	Strand (see 1.2)	Visual	01001
102.	Mealed (see 1.2)	Visual	01002
103.	Wire missing (Type III only) (see 1.2)	Visual	01003
Minor: None defined.			

4.2.2.2 Container prior to sealing.

Categories	Defects	Method of inspection	Code No.
Critical: None defined.			
Major: None defined.			
Minor: AQL 1.00 percent			
201.	Package improperly wrapped and sealed	Visual	02001
202.	Marking misleading or unidentifiable	Visual	02002

4.2.2.3 Container sealed.

Categories	Defects	Method of inspection	Code No.
Critical: None defined.			
Major: None defined.			
Minor: AQL 0.40 percent			
201.	Container damaged so that contents are exposed or liable to become exposed	Visual	03001
202.	Marking misleading or unidentifiable	Visual	03002

4.2.3 Testing.

4.2.3.1 Straightness and rigidity (see 3.2)
Major defect. Forty pieces of Quickmatch shall be selected from the lot for this test. If any pieces fail to comply the lot shall be rejected (Code Nos. 05001 and 06001).

4.2.3.2 Burning time (see 3.3) Major defect. Code No. 07001.

4.2.3.2.1 Beginning with the first lot produced and continuing until three consecutive lots have complied with the acceptance criteria specified, sixty pieces of Quickmatch shall be selected from the lot for this test. If any specimen fails to comply with the requirement, the lot shall be rejected. The test shall be performed as specified in 4.3.2.

4.2.3.2.2 After three consecutive lots have met the criteria of 4.2.3.2.1, twenty pieces of Quickmatch shall be selected from the lot for this test. If any specimen fails to comply with the requirement, the lot shall be rejected. The test shall be performed as specified in 4.3.2.

4.2.3.3 Cotton wick (see 3.1.2). A sample shall be taken from each roll of cotton wick, if the sample fails the roll shall not be used.

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The test shall be performed as specified in 4.3.3.

4.3 Test methods and procedures.

4.3.1 Straightness and rigidity.

4.3.1.1 *Straightness.* The piece of Quickmatch shall be placed on a flat surface and the largest bow measured with a scale.

4.3.1.2 *Rigidity.* The piece of Quickmatch shall be supported at its center and the deflection measured.

4.3.2 *Burning time.* A sample 12 inches long shall be cut from each piece. The specimen shall be placed on a flat open surface and ignited on one end. The burning time of each piece shall be determined and recorded.

4.3.3 *Cotton wick.* The test shall be performed in accordance with the procedure specified in Test Method 4100, of Federal Specification CCC-T-191.

5. PREPARATION FOR DELIVERY

5.1 Packaging.

5.1.1 *Level C.* Unless otherwise specified, the Quickmatch shall be tied in bundles of 200 pieces each in such a manner that the straightness and rigidity of the pieces will be maintained. Each tied bundle shall be wrapped with waterproof paper and sealed.

5.2 Packing.

5.2.1 *Level C.* Unless otherwise specified, the bundles of Quickmatch shall be packed in standard commercial containers so constructed as to insure acceptance by common or other carrier for safe transportation to the point of delivery.

5.3 *Marking.* Each unit package shall be marked to indicate the item and quantity contained therein. The container shall be marked as follows: In addition to any special

marking required by the contract or order, the container shall be marked in accordance with Interstate Commerce Commission rules and regulations and Standard MIL-STD-129.

6. NOTES

6.1 *Intended use.* The Quickmatch covered by this specification is intended for use in igniting flares and signal cartridges.

6.2 *Ordering data.* Procurement documents should specify the following:

- (a) Title, number and date of the specification.
- (b) Type and class of Quickmatch required (see 1.2).
- (c) Length of pieces of Quickmatch required (see 3.4).

6.3 *Inspection code numbers.* The five digit code numbers assigned to the inspection herein are to facilitate future data collection and analysis by the Government.

6.4 *Impregnating mixture.* The following has been found satisfactory: A mixture of water and starch in the proportion of 2 quarts of water to 4 ounces of starch shall be boiled until a jelly is formed. Six pounds of black powder is added to the mixture and stirred until the mass is thoroughly incorporated.

6.4.1 *Unmealed.* The strands of cotton are thoroughly impregnated with the impregnating mixture and allowed to dry until rigid.

6.4.2 *Mealed.* The strands of cotton wick are thoroughly impregnated with the impregnating mixture, coated while wet with black powder and allowed to dry.

6.4.3 Dextrin in an amount not to exceed 1.5 percent of the total weight of black powder may be added.

Custodians:

Army—MU
Navy—Weps

Preparing activity:

Army—MU
Project No. 1370-0112

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