MIL-R-398C
22 AUGUST 1962
SUPERSEDING
MIL-R-00398B (Ord)
29 NOVEMBER 1957
MIL-R-398A
12 JULY 1956

MILITARY SPECIFICATION

RDX

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

1. SCOPE

1.1 Scope. This specification covers two types of RDX for use in explosive compositions as follows: (see 6.1)

Type A — RDX made by the nitric acid process (see 6.6).

Type B — RDX made by the acetic anhydride process (see 6.6).

1.2 Classification. The classification of RDX in accordance with granulation and its related use in explosives shall be advisory only (see 6.1 and 6.2).

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 to the extent specified herein.

SPECIFICATIONS

FEDERAL

RR-S-366 — Sieves; Standard, for Testing Purposes.

STANDARDS

MILITARY

MIL-STD-105 — Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-109 — Inspection Terms and Definitions.

MIL-STD-129 — Marking for Shipment and Storage.

PUBLICATIONS

ORDNANCE CORPS

ORD-M608-11 — Procedures and Tables for Continuous Sampling by Attributes.

(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.)

FSC: 1375

2.2 Other publications. The following documents form a part of this specification. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply to the extent specified herein.

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-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 Chemical requirements. RDX shall conform to the applicable chemical requirements specified in Table I, when tested as specified in the applicable paragraphs. (see 6.8).

TABLE I

Properties	Percent		Applicable paragraphs
Types	A	B	—
Melting Point, degrees Centigrade (°C) Minimum (Min.)	200.0	190.0	4.3.1
Total acetone insoluble material, Maximum (Max.)	0.05	0.05	4.3.2
Inorganic insoluble material, Max.	0.03	0.03	4.3.3
Insoluble particles, retained on U.S. Standard No. 60, number of particles, sieve, Max.	5	5	4.3.4
Acidity, Max.	0.05	0.02	4.3.5

3.2 Granulation. The granulation shall be specified by the procuring activity (see 6.1, 6.2 and 6.3).

4. QUALITY ASSURANCE PROVISIONS

4.1 General quality assurance provisions. The supplier is responsible for the performance of all inspection requirements 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 other specifications 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 non-conforming 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 the 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 submitted:

(a) A statement that the lot complies with all quality assurance provisions of the approved current written description of the system.

(b) Quantity of product inspected.

(c) Results obtained for all inspection performed shall be made available upon request by the Resident Ordnance Inspection.

(d) Specification number and date, together with an identification and date of changes.

(e) Certificates of analysis on all material procured directly by the contractor when such material is controlled by Government specifications listed in any of the contractual documents shall be made available upon request by the Resident Ordnance Inspection.

(f Quantity of product in the lot.

(g) Date submitted.

This 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 specification, and other contractual documents as a guide, the Government inspector 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 assurance 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, re-sampling, 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 4.1.3.2.

(b) Verification at the point of delivery

shall be in accordance with 4.1.3.2.

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

(a) Observation of procedures 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 equivalents thereto.

(d) Review of procedures for control and disposition of non-conforming material.

4.1.3.2 *Product inspection.* Product inspection shall consist of Government inspection of product which has been previously inspected by the contractor and found to meet the quality assurance provisions of this specification. The inspection by the Government shall be performed in order to determine that the product is of the quality required by this specification and that the contractor's records are reliable.

4.2 Inspection provisions.

4.2.1 *Lot formation.* A lot shall consist of RDX, 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 RDX 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. Continuous sampling plans in accordance with Handbook ORD-M608-11 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 *Bag, cotton duck (see 5.1).*

Categories	Defects	Method of inspection (see 6.2)	Code No.
Major	AQL 0.25 percent		
101.	Foreign matter	Visual	01001
102.	Bag pierced or torn	Visual	01002

4.2.2.2 *Sealed rubber bag (see 5.1).*

Categories	Defects	Method of inspection	Code No.
Major	AQL 0.40 percent		
101.	Bag improperly closed	Visual-Manual	02001
102.	Gross weight, max	Balance	02002
103.	Bag damaged	Visual	02003

4.2.2.3 *Sealed keg or drum (see 5.2).*

Categories	Defects	Method of inspection	Code No.
Major	AQL 0.25 percent		
101.	Sealing improper	Visual-Manual	03001
102.	Keg or drum damaged	Visual	03002
Minor	AQL 0.40 percent		
201.	Marking misleading or unidentifiable	Visual	03003

4.2.3 *Testing.*

4.2.3.1 *Sampling by lot.* A random sample of 10 containers shall be selected from each lot. When lots are comprised of 10 containers or less, each container shall be sampled.

4.2.3.1.1 *Preparation of composite.* Approximately one ounce primary sample of RDX shall be removed from each of the 10 containers in order to equal 10 ounces. If there are less than 10 containers, equal primary samples in sufficient quantity to equal 10 ounces, shall be removed from each container. The individual primary samples shall then be combined in order to form a homogeneous composite sample of 10 ounces and subjected to the tests specified in 4.3. If the composite sample fails to comply with any of the requirements specified, the lot shall be rejected.

4.3 Test methods and procedures.

4.3.1 *Determination of melting point.* Code No. 04001.

4.3.1.1 *Apparatus.* A melting point bath equipped with a mechanical stirrer and a source of heat that can be easily regulated shall be set up. A beaker of 1 to 2 liters capacity about ¾ full of clear paraffin oil is suitable. An accurately standardized total immersion Centigrade (C.) thermometer shall be suspended in the bath so that the bulb is not less than 1.5 inches from the bottom of the bath. If the mercury column is not completely immersed at the temperature of the observed melting, a second thermometer shall be suspended about 0.5 inch from the first thermometer with its bulb approximately at the height of the middle of the exposed mercury column of the first thermometer.

4.3.1.2 *Procedure.* A thin-walled capillary tube of uniform diameter, long enough to extend beyond the top of the bath shall be used. The tube shall be filled with a dry portion of the sample to a depth of approximately 4 millimeters (mm), the sample compacted by tapping, and the tube fastened to the standardized thermometer so that the lower end of the tube is in contact with the bulb of the thermometer. The stirrer shall be started and the bath heated rapidly to approximately 180 degrees C., then gradually heated so that the rise in temperature is not less than 1 degree in 3 minutes nor more than 1 degree in 1 minute. Since RDX does not melt sharply or give a definite meniscus, the melting point of the material shall be observed at the point at which the sample first gives evidence of movement in the capillary, exclusive of shriveling. There is an increase in volume caused by decomposition and evolution of gas. This is especially marked with Type B. The beginning of gas evolution causes the sample to rise slowly in the capillary. The temperature at which this occurs shall be taken as the melting point.

4.3.1.3 *Report.* If the mercury column is completely immersed at the melting point temperature, this temperature shall be reported with calibration corrections applied, as the melting point of the sample. If part of the column is exposed, the following correction shall be added to the observed temperature:

$$\text{Correction} = n\ (T\text{-}t)\ 0.000159$$

Where:

n = number of degrees C. in the exposed mercury column.

T = uncorrected melting point in degrees C.

t = average temperature in degrees C. of the exposed mercury column.

4.3.1.4 *Alternate method.* The Fischer John hot stage melting apparatus point shall be used as an alternate method. Code No. 05001.

4.3.2 *Determination of acetone insoluble material.* An accurately weighed portion of

approximately 10 grams (gm) of the dried sample shall be placed in a 400 milliliter (ml) beaker and 200 ml of acetone added. The beaker shall be covered with a watch glass and heated on a steam bath until the RDX is dissolved. The acetone solution shall be filtered through a tared filtering crucible, prepared by washing the filter with acetone, igniting and weighing. Care shall be taken to transfer all the insoluble matter to the crucible. The residue shall be washed 3 times with acetone. The crucible shall be dried for 30 minutes in an oven at 105 degrees plus or minus 5 degrees C., cooled in a desiccator and weighed. The increase in weight shall be calculated as percent insoluble matter in the sample. Code No. 06001.

4.3.3 *Determination of inorganic insoluble material.* At a temperature of approximately 700 degrees C., the material in the crucible, obtained as directed in 4.3.2 shall be ignited, cooled, and reweighed. The increase in weight over the original tare weight shall be calculated as percent inorganic insoluble material. Code No. 07001.

4.3.4 *Determination of insoluble particles.* A 50 gm. portion of the sample shall be weighed in a 400 ml. beaker. One-hundred ml. of acetone shall be added and the beaker and contents heated on a steam bath until all lumps are broken down and all soluble material is dissolved. The mixture shall be poured through a small U. S. Standard No. 60 sieve. Care shall be taken to wash all the insoluble matter from the beaker with acetone. The residue in the sieve shall then be washed with acetone to remove the RDX. The particles retained shall be counted. Sieve shall comply with the requirements of Specification RR–S–366. Code No. 08001.

4.3.5 *Determination of acidity.* A ten gram portion of the sample shall be transferred to a 400 ml. beaker, 100 ml. of acetone added, and heated on a steam bath until the RDX is completely dissolved. One-hundred ml. of distilled water shall be added and the mixture cooled and titrated with 0.05 N. sodium hydroxide using phenolphthalein or methyl red indicator. A blank shall be run and the results of the titration of the sample corrected for acidity of reagents. The acidity shall be calculated on a dry basis to percent nitric acid or acetic acid for Types A or B, respectively. Code No. 09001.

CALCULATIONS FOR ACIDITY

Percent Nitric acid =
6.3 (V-v) N divided by W

Percent Acetic acid =
6.0 (V-v) N divided by W

Where:

V = ml. NaOH used in test determination.
v = ml. NaOH used in blank determination.
N = Normality of NaOH solution used.
W = weight of sample, dry basis.

4.3.6 *Determination of granulations.* If a dry sample is to be tested, the preparation (see 4.3.6.1) shall be disregarded and the granulation determination (see 4.3.6.2) shall be proceeded with directly. Code No. 10001.

4.3.6.1 *Preparation of sample.* The sample of wet RDX shall be mixed to insure uniform distribution of the various size particles and then a portion of the sample containing approximately 70 gm. of RDX (dry basis) shall be transferred to a Buchner funnel previously fitted with a No. 42 Whatman filter paper or equivalent. Air shall be drawn through the funnel and contents for approximately 10 minutes. The RDX shall be transferred to a large sheet of paper and mixed again with a wooden or hard rubber spatula to insure uniform moisture content and uniform distribution of various size particles. Approximately 5 gm. of this material shall be transferred to each of two accurately tared medium porosity glass filtering crucibles having covers (a small Petri dish or watch glass has been found satisfactory).

The remainder of the air-dried sample shall be retained for determination of granulation. The covered crucible and contents shall be weighed quickly and transferred to suction filtering flasks fitted with suitable adapters. Fifteen ml. of anhydrous methanol shall be added to each crucible and the methanol allowed to remain in contact with the RDX for approximately 5 seconds before suction is applied. This washing operation shall be repeated a second time, and then the crucibles and contents shall be aspirated with aid of suction until the odor of methanol is no longer discernible when the vacuum line is turned off. The uncovered crucibles and covers shall be dried in an oven maintained at 105 degrees plus or minus 2 degrees C. for 15 minutes. The crucible shall be covered, transferred to a desiccator, cooled, and weighed. The loss in weight shall be calculated to percent moisture as follows:

Percent Moisture =

A–(B plus 0.05) × 100 divided by W

Where:

A = weight of crucible, cover and contents, gm.

B = weight of crucible, cover and contents after washing and drying.

W = weight of sample, gm.

0.05 = the value in grams, subtracted from the total weight loss to account for loss due to the solubility of RDX in methanol. It is not dependent on the weight of the sample used in conducting the moisture determination. The average of the two determinations shall be used to calculate the dry weight of RDX used in conducting the granulation determination.

4.3.6.2 *Procedure.* An accurately weighed portion of approximately 50 gm. (dry weight) of the sample shall be transferred to a 600 ml. beaker containing approximately 300 ml. of a 2 percent solution of a suitable wetting agent such as dioctyl sodium sulfosuccinate. (see 6.4). With the aid of a rubber policeman attached to a glass stirring rod, the mixture shall be stirred for a few minutes wetting the sample thoroughly and breaking up as many of the aggregates as possible.

(a) A spray nozzle (see 6.5) under tap water pressure, shall be used to quantitatively transfer this mixture to the uppermost sieve of a set of the specified 8-inch U. S. Standard sieves complying with Specification RR-S-366, nested in order of decreasing size, the largest mesh being placed on top. This assembly should be set up near a water tap and drain. Provision should be made to prevent transfer of the explosive to the drain. The pressure of the spray shall be adjusted so that when the spray strikes the sample at an angle approximately perpendicular to the screen from a height of 2 to 3 inches, it is possible to wash the sample back and forth across the sieve without splashing any of the material over the side of the sieve. The spray should be moved about the screen at a rate such that the spray would traverse the diameter of the screen 1 to 2 times per second. The wet agglomerates shall be gently crushed on the top sieve with the aid of a rubber policeman and the washing of the material back and forth across the sieve with the water spray shall be continued until all the agglomerates have been broken and only individual crystals larger than the mesh of the sieve remain on the sieve. The rubber policeman shall be used in

breaking up the agglomerates on only the uppermost sieve. The top sieve shall be removed and a few drops of a 10 percent solution of the wetting agent shall be added to the material on the next sieve and washed with the water spray as before for 5 minutes or until no change is noticed in the amount of crystals remaining. This procedure shall be repeated for each of the sieves.

(b) After the washing has been completed, the portions remaining on each of the screens shall be quantitatively transferred by means of a suitable transfer funnel into a separate previously tared fritted glass filtering crucible of medium porosity as follows: The screen shall be held in an almost vertical position and with a moderate spray of water from the spray nozzle, the material shall be gently washed to the lower part of the screen by drawing the spray back and forth across the screen, beginning at the top and moving slowly down the screen as the crystals move down. When the material has been collected at the lower part of the sieve, it can readily be washed into the crucible with a stream of water from a wash bottle.

(c) The crucible shall be aspirated during the transfer process and the crucible and contents shall be aspirated for approximately 2 minutes after the transfer has been completed. The suction shall be turned off and 15 ml. of anhydrous methanol added to the crucible and contents; the methanol shall be allowed to remain in contact with the explosive for approximately 5 seconds and then removed with the aid of suction. The contents of the crucible shall be washed once more with anhydrous methanol as described above and then the crucible and contents shall be aspirated until the odor of methanol is no longer discernible. The crucible and contents shall be dried in an oven maintained at 105 degrees C plus or minus 2 degrees for 15 minutes, cooled in a desiccator and weighed.

(d) The weight of material retained on each sieve shall be determined and the percentage passing through each sieve calculated on the basis of the dry weight of the RDX sample to determine compliance with 3.2 (Table II).

5. PREPARATION FOR DELIVERY

5.1 Preservation and Packaging.

5.1.1 *Level A.* Unless otherwise specified by the procuring activity, the RDX shall be thoroughly mixed to form a slurry or cake containing not less than 10 percent by weight of a solution made as follows: 40 percent by weight of isopropyl alcohol and 60 percent water. The RDX shall be packed in this wet condition in bags made of double filled, gray cotton duck weighing not less than 12 ounces per square yard or approved substantial equal. The bags shall be large enough to hold a max. of 50 pounds (dry weight) of crystalline RDX. The bags containing the wet RDX shall be securely closed with non-metallic cord and then placed in a rubber bag, rubberized cloth bag, or two bags, placed one inside the other and individually closed, made from .004 inch thick polyethylene film or bags made of suitable watertight material. (see 6.7). Not more than six of the smaller bags shall be placed in the larger bag.

5.2 Packing (see 6.2).

5.2.1 *Level A.* The large bags containing a maximum of 300 pounds dry weight of crystalline RDX shall be placed in a keg or drum complying with Interstate Commerce Commission Specification 5, 5B or 21B as applicable, as required in Code of Federal Regulations 49 CFR 71-90.

5.3 **Marking.** Each container shall be clearly labeled with the lot number and net weight of its contents. When a container has RDX from more than one lot, all lot, all lot numbers shall be shown on the label and each of the small bags inside the container shall be clearly and permanently labeled with the lot number of its contents. Containers shall be marked to insure safe handling as required by Code of Federal Regulations 49 CFR 71-90. In addition, shipments shall be marked in accordance with Standard MIL-STD-129.

5.3.1 When specified, exterior containers for overseas shipment shall be marked with Ordnance Corps symbol and the Supply Manual group of the item.

6. NOTES

6.1 **Use.** The following uses of RDX, based on granulation (TABLE II) are advisory only:

Class A, for use in Composition A-3, Composition B, Composition C-4, and Cyclotol.

Class B, for use in Composition A-3 and Composition C-4.

Class C, for use in preparation of RDX booster and detonator pellets.

Class D, for use in Cyclotols.

Class E, for use in Composition C-4 and Plastic Bonded Explosives.

Class F, for use in Composition B-3.

Class G, for use in Plastic Bonded Explosives.

Class H, for use in Composition C-4.

6.2 **Granulation.** Advisory granulations for RDX are shown in TABLE II when tested as specified in 4.3.6.

TABLE II

Through U.S. Standard Sieve No	A Percent	B Percent	C Percent	D Percent	E Percent	F Percent	G Percent	H Percent
8				100				
12			99 (min)					
20	98 ± 2							100
35		99 ± 1		20 ± 20				98 (min)
50	90 ± 10	95 ± 5	40 ± 10				98 ± 2	
60						99^{+1}_{-8}		
80						97^{+3}_{-6}		
100	60 ± 30	65 ± 15	20 ± 10				90 ± 8	90 (min)
120						83^{+10}_{-16}		
170						65^{+15}_{-22}		
200	25 ± 20	33 ± 13	10 ± 10				46 ± 15	70^{+10}_{-15}
230						36 ± 14		
325					97 (min)	22 ± 14		50 ± 10

6.3 Ordering data. Procurement documents should specify the following:

(a) Title, number and date of this specification.

(b) Type and Class RDX required (see 1.1, 6.1, and 6.2).

6.4 Dioctyl sodium sulfosuccinate is commercially available as Aerosol OT.

6.5 A spray nozzle can be made by fitting a Gooch crucible, (Number 5, Coors porcelain crucible containing about 75 openings approximately 0.07 centimeter (cm) in diameter has been found satisfactory) over a Number 8 one-hole rubber stopper fitted with a short piece of glass tubing to which is attached a length of rubber hose approximately 1 cm. inside diameter. The free end of the hose is connected to the water tap and the Gooch crucible at the other end acts as a spray nozzle.

6.6 RDX Type A consists essentially of cyclotrimethylene-trinitramine and RDX Type B consists of cyclotrimethylene-trinitramine and cyclotetramethylene-tetranitramine.

6.7 **Water-tight material.** The following materials have been found satisfactory: Scotchpak 45AX48, .0045 inch thick or Scotchpak Brand Barrier Material 140A22, .0140 inch thick.

6.8 **International standardization agreement.** Certain provisions, section 3 and 4.3 of this specification, are the subject of international standardization agreement STANAG No. 4022. When amendment, revision, or cancellation of the specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that appropriate action may be taken respecting the international agreement concerned.

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

Custodians:
Army—Ordnance Corps
Navy—Bureau of Naval Weapons
Air Force—OOAMA
Internation Interest (see 6.8)

Preparing activity:
Army—Ordnance Corps

STRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in mitting comments and suggestions for improvements. All users of military standardization documents are invited to provide gestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and iled. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the blems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an nowledgement will be mailed to you within 30 days to let you know that your comments were received and are being sidered.

TE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of cification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization waive any portion of the referenced document*(s)* or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

PARTMENT OF THE NAVY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

ICIAL BUSINESS
ALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12503 WASHINGTON D. C.

POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE NAVY

Commanding Officer
Picatinny Arsenal
Attn: MUPA-DC7
Dover, NJ

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*:

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 1426

MIL-R-398C (AR)
AMENDMENT 4
12 July 1977
SUPERSEDING
AMENDMENT 3
14 August 1973

MILITARY SPECIFICATION

RDX

This Amendment forms a part of Military Specification MIL-R-398C dated 22 August 1962, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

Paragraph 1.1: After "see 6.1", add "and 6.10" Delete "Type A" and "Type B" and substitute "Type I" and "Type II" respectively.

Paragraph 2: Delete in its entirety and substitute:

*"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

CCC-C-461 - Cloth, Twill, Uniform Cotton
PPP-B-26 - Bag, Plastic, Polyethylene
RR-S-366 - Sieves, Standard for Testing Purposes

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes (ABC-STD-105)

FSC: 1376

MIL-STD-109 - Quality Assurance Terms and Definitions
MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-1168 - Lot Numbering of Ammunition
MIL-STD-1235 - Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes

PUBLICATIONS

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM Designation E300 - Recommended Practice for Sampling Industrial Chemicals

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

(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).

PAGES 2 and 3

2.2 Other publications. The following documents form a part of this specification. Unless otherwise indicated, the issue in effect on date of invitations for bids shall apply to the extent specified herein.

CODE OF FEDERAL REGULATIONS

49 CFR 100-199 - Department of Transportation Rules and Regulations for the Transportation of Explosives and Other Dangerous Articles

(The Code of Federal Regulations is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Orders for the above publication should cite, "49 CFR 100-199 (latest revision).")"

Paragraph 3.1: Delete "Table I" in its entirety and substitu

TABLE I

Test	Type I	Type II	Pa
Melting point, Centrigrade (C) min.	200.0	190.0	
Total acetone insoluble material, % maximum, max.	0.05	0.05	
Inorganic insoluble, %, max.	0.03	0.03	
Insoluble particles, retained on U.S. Standard No. 60, Number of particles, sieve	5	5	
Acidity, %, max.	0.05	0.02	

Paragraph 4.1: Delete in its entirety and substitute:

"4.1 Responsibility for inspection. Unless otherwise s in the contract or purchase order, the supplier is responsibl the performance of all inspection requirements as specified h Except as otherwise specified in the contract or order, the s may use his own or any other facilities suitable for the perf of the inspection requirements specified herein, unless disap by the Government. The Government reserves the right to perf any of the inspections set forth in the specification where s inspections are deemed necessary to assure supplies and servi conform to prescribed requirements. Reference shall be made MIL-STD-109 to define terms used herein.

4.1.1 Submission of product. At the time each complete lot of items deliverable under the contract is submitted to th Government for acceptance, the contractor shall supply the fol information accompanied by a certificate which attests that th information provided is correct and applicable to the product being submitted:

a. A statement that the lot complies with all of the quality assurance provisions specified in this specification.

b. Specification number and date, together with ident cation and date of changes thereto.

c. Certificates of analysis on all materials used directly by the contractor when such material is controlled by Government specifications shall be made available upon request by the Contracting Officer.

d. Quantity of RDX in pounds in the lot.

e. 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."

PAGE 4

Paragraph 4.2.1: Delete in its entirety and substitute:

"4.2.1 Lot formation. A lot shall consist of a homogeneous blend of RDX from one or more batches 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 RDX that has been subjected to the same unit chemical or physical process. The lot shall be submitted for inspection in accordance with MIL-STD-105 (or MIL-STD-1235 when applicable). The criteria and procedures for the assignment of lot numbers shall be in accordance with MIL-STD-1168."

*Paragraph 4.2.2: Delete in its entirety and substitute:

"4.2.2 Examination. Sampling plans and procedures for the following classifications of defects shall be in accordance with MIL-STD-105 (ABC-STD-105), except that inspection for critical defects shall be 100 percent. Contractor's sampling plans, if used shall be approved by the Government and shall provide, as a minimum, the protection afforded the Government by the sampling plans in MIL-STD-105. Continuous sampling plans in accordance with 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 0.40 percent for each Major defect and an AQL of 0.65 percent for each Minor defect, except where 100 percent inspection is specified."

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.1	Bag, Cloth				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None Defined.				
Major					
101	Foreign matter		0.40%	—	Visual
102	Bag pierced or torn		0.40%	5.1	Visual
103	Not tied or improperly tied		0.40%	5.1	Visual
Minor	None Defined.				

NOTES:

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.2	Sealed Rubber Bag				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None Defined.				
Major					
101	Bag improperly closed		0.65%	5.1	Visual/Manual
102	Bag damaged		0.65%	5.1	Balance
103	Insufficient solution		0.65%	5.1	Visual
104	Insufficient alcohol in solution		0.65%	5.1	Hydrometer
105	Net weight		0.65%	5.2	Visual
Minor	None Defined.				

NOTES:

SARPA-QA FORM 2567 FEB 74 4810

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.3	Polyethylene Bag				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None Defined.				
Major					
101	Seam splits when manual pressure is applied along entire length of seam		0.65%	5.1	Visual/Manual
102	Bag damaged		0.65%	5.1	Visual
Minor	None Defined.				

NOTES:

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.4	Tied Polyethylene Bag				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None Defined.				
Major					
101	Bag improperly closed		0.65%	5.1	Visual
102	Bag damaged		0.65%	5.1	Visual
103	Insufficient Solution		0.65%	5.1	Visual
104	Insufficient alcohol in solution		0.65%	5.1	Hydrometer
105	Net weight		0.65%	5.2	Visual
Minor	None Defined.				

NOTES:

SARPA-QA FORM 2567 FEB 74 4810

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.5	Sealed Drum				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None Defined.				
Major					
101	Sealing improper		0.65%	5.2	Visual/Manual
102	Drum damaged		0.65%	5.2	Visual
103	Alcohol solution leaking from drum		0.65%	5.2	Visual
Minor					
201	Marking missing, incorrect or illegible		0.65%	5.3	Visual"

NOTES:

PAGE 5

Paragraph 4.2.3: Delete in its entirety and substitute:

"4.2.3 Testing

4.2.3.1 Sampling. The tests depicted in 4.3.1 through 4.3.6 shall be performed on a representative sample from each batch. A representative sample of approximately (12) ounces shall be selected from each batch in accordance with ASTM Procedure E300-70 for solids. The inspection of the samples shall be in accordance with MIL-STD-1235 CSP-1 Plan, Inspection Level II, AQL 4.0%. If any sample fails to meet any test requirement the batch represented by the sample shall be rejected. All batches produced between the time that the last batch was tested and accepted and the batch which failed shall be tested in accordance with the applicable methods given in paragraph 4.3. If any of these batches fail to meet any of the test requirements, that batch shall also, be rejected. In addition, after any failure of a batch the contractor will return to 100% inspection until "i" successive batches are accepted as required by MIL-STD-1235. The classification and code number shall be as given in Table III.

TABLE III

Melting point determination (see 3.1)	Major Defect Code No. 04001
Alternate m.p. determination (see 3.1)	Major Defect Code No. 05001
Acetone insoluble material (see 3.1)	Major Defect Code No. 06001
Inorganic insoluble material (see 3.1)	Major Defect Code No. 07001
Insoluble particles (see 3.1)	Major Defect Code No. 08001
Acidity determination (see 3.1)	Major Defect Code No. 09001
Granulation determination (see 3.2)	Major Defect Code No. 10001"

PAGE 8

*Section 5: Delete in its entirety and substitute:

"5. Preparation for Delivery

5.1 Preservation and Packaging

5.1.1 Level A. Unless otherwise specified by the procuring activity, the RDX shall be thoroughly mixed to form a slurry or cake containing not less than 10 percent by weight of a solution

made as follows: 40 percent by weight of isopropyl alcohol and 60 percent water. Not more than 50 pounds, dry weight, of the wet RDX shall be packed in a cloth bag described in 5.1.1.2. The filled cloth bags shall be placed in a rubber bag, rubberized cloth bag or two polyethylene bags, described in 5.1.1.1, placed one inside the other. Inner and outer bags shall be securely tied with the polyethylene bags individually tied, using non-metallic tape or cord. The tops of the outer bags shall be gathered and formed into a goose-neck when being tied.

5.1.1.1 The polyethylene bags shall comply with Type II, Style 1 of Specification PPP-B-26 except that closure will not be heat sealed. The bag size shall be large enough to prevent strain on the bag when it is placed in the drum and filled; the length shall be sufficient to allow gathering of the top and folding into a gooseneck when tying. The bag seams shall meet the seam strength test with an AQL of 0.65 percent at 50 percent of the breaking strength of the polyethylene film. Seams shall also be examined by separating the bag faces and applying pressure manually along the entire length of the seam. Seams which can be opened at any point in this manner are not acceptable.

5.1.1.2 The cloth bags shall be made from white cotton twill, free of size and brighteners, complying with the general requirements of Specification CCC-C-461 and the following detailed requirements:

Yarn	Carded
Yarn Ply	Warp 12/1 Fill 18/1
Weight:	7.2 $\pm$ .5 oz/sq yd (Greige) 6.2 $\pm$ .5 oz/sq yd (after bleaching)
Yarns per inch (minimum)	Warp 78 Fill 47
Breaking Strength (minimum)	Warp 170 Fill 70
Weave	3 x 1 twill

A suggested bag size is 19 inches wide by 29 inches in depth. The tie tape may be attached to the bag by sewing. Alternatively, double filled gray cotton duck weighing not less than 12 oz. per square yard may be used for the bag.

5.2 Packing

5.2.1 Level A. The outer bag containing a maximum of 300 pounds dry weight of crystalline RDX shall be placed in a drum complying with Department of Transportation specification 5 or 5B of the Code of Federal Regulations 49 CFR 100-199.

5.2.2 Level B. The outer bag containing a maximum of 225 pounds dry weight of crystalline RDX shall be placed in a drum complying with DOT Specification 21C.

5.3 Marking. Containers shall be marked as required by Code of Federal Regulations 49 CFR 100-199. In addition, shipments shall be marked in accordance with Standard MIL-STD-129. Each container shall be clearly labelled with the lot number and net weight of its contents. When a container holds RDX from more than one lot, all lot numbers shall be shown on the label and each of the small bags inside the container shall be clearly and permanently labelled with the lot number of its contents."

PAGE 9

Section 6: Table II: Change "A Percent, B Percent...H Percent" to "1 Percent, 2 Percent....8 Percent"

Paragraph 6.1: Change "Class A, Class B...Class H" to "Class 1 (see 6.10), Class 2.....Class 8"

Paragraph 6.3: Add: "(c) Acceptance and description sheets shall be prepared for each lot in accordance with MIL-STD-1171."

Paragraph 6.6: Change "Type A: and "Type B" to "Type I" and "Type II" respectively.

Paragraph 6.8: After "STANAG No. 4022", Add "and ABC-Army-STD-115"

Add new paragraph:

"6.10 In accordance with the designation of classifications, paragraph 5-222 of Defense Standardization Manual 4120.3-M, the following designation changes are implemented in this amendment:

"Type A and B: as specified in MIL-R-398C is changed to "Type I and II" and "Class A,B,C,D,E,F,G,H" as specified in MIL-R-398C is changed to "Class 1,2,3,4,5,6,7,8". In the next division of the affected specification, these changes will be implemented."

*The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoeve for any inaccuracies in these notations. Bidders and contractors ar cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment."

Custodian:
ARMY-AR
NAVY-OS
AIR FORCE-70

Preparing Activity:
ARMY-AR

Reviewing Activity:
ARMY-AR
NAVY-OS
AIR FORCE-70

Project Number: 1376-0127

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12062 WASHINGTON D C

POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE ARMY

Commander
US Army Armement Research and Development Command
ATTN: DRDAR-TSI-S
Dover, NJ 07801

POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions -- Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 1426 PREVIOUS EDITION IS OBSOLETE