MILITARY SPECIFICATION

CARBON BLACK

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one type of carbon black referred to herein as "the material".

2. APPLICABLE DOCUMENTS

2.1 Issues of documents. 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.

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipping and Storage

(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 documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of the invitation for bids or the request for proposal shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1506-75	Ash Content of Carbon Black
ASTM D 1509-75	Heating Loss of Carbon Black
ASTM D 1512-75	pH Value of Carbon Black

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Ordnance Station, Standardization Division (Code 611), Indian Head, Maryland 20640 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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

CODE OF FEDERAL REGULATIONS

49 CFR 100-199 Transportation

(The Code of Federal Regulations is available from the Superintendent of Docuemnts, U. S. Government Printing Office, Washington, DC 20402. Orders should specify "49 CFR 100-199 (latest revision)").

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT
National Motor Freight Classification

(Application for copies should be addressed to American Trucking Associations, Attn: Tarriff Order Section, 1616 P Street, Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT
Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Material. The material shall be carbon black in fine powder form.

3.2 Chemical and physical properties. The chemical and physical properties of the material shall be in accordance with TABLE I.

TABLE I. Chemical and physical properties.

CHARACTERISTIC	REQUIREMENTS MIN	MAX
Heating loss, Weight %	-	1.0
ASH, Weight %	-	0.1
Ether Extract, Weight %	-	0.1
pH value	2.0	6.0
Iodine Absorption, Volume %	95	-

3.3 Workmanship. The material shall be uniform, free from contaminants, foreign material or any other defect that would prevent its use for the purpose intended.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Inspection conditions. Unless otherwise specified (see 6.2), all inspections shall be performed under the following conditions:

a. Temperature: Room ambient 18 to 35°C (65 to 95°F)
b. Altitude: Normal ground
c. Vibration: None
d. Humidity: Room ambient to 95 percent relative, maximum

4.3 Sampling.

4.3.1 Lot. Unless otherwise specified in the contract (see 6.2), a lot shall consist of all material manufactured in one continuous production run or in one batch, under essentially identical conditions, from the same raw materials, and to be offered for acceptance at one time. Several batches, manufactured from the same raw materials, may be blended to form a uniform larger batch which shall then constitute a lot for inspection purposes.

4.3.2 Sampling. Sampling for quality conformance inspection shall be in accordance with inspection level I of MIL-STD-105. The sample unit shall be one unit package or container of material. Each sample shall consist of sufficient material to perform the quality conformance tests as specified in 4.4.

4.4 Quality conformance inspection. Each sample obtained in accordance with 4.3.2 shall be subjected to the tests of 4.5. The acceptable quality level (AQL) shall be 2.5% defective. When specified in the contract or order (see 6.2). The contractor shall furnish test reports showing quantitative results for all quality conformance tests specified for each lot of material.

4.5 Tests.

4.5.1 Heating loss. The heating loss shall be determined in accordance with ASTM D 1509-75.

4.5.2 Ash content. The ash content shall be determined in accordance with ASTM D 1506-75 with the following exceptions:

a. The sample shall not be dried prior to weighing.
b. The sample shall be ignited at 950°C.
c. The calculation shall be corrected so that
   c = weight of crucible plus the sample, g, and
   d = weight of crucible plus the ash, g.

4.5.3 Ether extract. The ether extract shall be determined in accordance with the following:

a. Weigh a sample of approximately 10 grams (g) of carbon black to the nearest 0.1 mg
b. Transfer the sample to an extraction thimble and extract with ether using a tared extraction flask and a Soxhlet extractor or equivalent. Use a hot-water bath or a steam plate as the source of heat. Adjust the applied heat so that ether drops from the reflux condenser at the rate of 2 to 3 drops per second. Continue the extraction for 8 hours.
c. Remove the extraction flask and evaporate the ether by heating on a steam bath until approximately 25 millilitres (ml) of the ether solution remains.
d. Complete the evaporation to dryness by blowing a slow current of dry air over the solution.
e. Dry the flask to constant weight to the nearest 0.1 mg in a vacuum desiccator containing ACS grade sulfuric acid.
f. Calculate the ether extractable matter as follows:

$$\text{wt\% ether extract} = \frac{(C-B)}{A} \times 100$$

A = weight of sample, g
B = weight of flask, g
C = weight of flask and residue, g

4.5.4 pH value. The pH value shall be determined in accordance with ASTM D 1512-75.

4.5.5 Iodine absorption. Iodine absorption shall be determined in accordance with the following:

a. Reagents:
   (1) Standardized iodine solution, 0.01 normal (N).
   (2) Standardized sodium thiosulfate solution, 0.01 N.
   (3) Starch indicator solution, 1 percent
b. Apparatus: Platinum crucible with cover, 15 ml (type used in coal analysis: 0.1 mm diameter hole should be punched in cover).

c. Procedure: Add sufficient quantity of the sample to fill the crucible to about 6 mm from the top. Place the cover tightly on the crucible and heat in a muffle furnace at 925° ± 20° C for 7 minutes. Remove the crucible from the furnace and cool in a desiccator with the crucible cover still in place. Remove and discard 8 to 12 mm of the top layer of the sample. Transfer the remaining sample to a flask supplied with a glass stopper. Add 100 ml of iodine solution, stopper and transfer to the mechanical shaker. Shake for approximately 30 minutes. Transfer the solution to a centrifuge tube, stopper and centrifuge until the solution is clear. If the solution does not become clear, filter through filter paper in a glass funnel. Using a buret, transfer 40 ml of the centrifuged solution to an iodine flask and titrate with the standardized sodium thiosulfate until nearly all of the free iodine is neutralized. Add 3 or 4 drops of starch solution and complete the titration. Run a blank using 40 ml of the standardized iodine solution. The blank shall be processed through the same procedure as the sample and a blank shall accompany each determination.

d. Calculation:

(1) Iodine absorption, volume % = $\frac{A-B}{A} \times 100$

where: A = volume of sodium thiosulfate solution used in blank, ml
B = volume of sodium thiosulfate solution used in sample, ml

4.6 Packaging inspection. The packaging, packing and marking shall be inspected to verify conformance with the requirements of section 5.

5. PACKAGING

5.1 Packaging and packing. Unless otherwise specified in the contract or order (see 6.2), packaging and packing shall be level C.

5.1.1 Level C. Unless otherwise specified in the contract or order (see 6.2), packaging and packing of carbon black shall be in accordance with standard commercial practice applicable to the type of material. The packaging and packing shall be of such construction and materials that the contents will be adequately protected against loss or contamination. Container size shall be as specified in the contract or order (see 6.2). Containers shall conform to Uniform Freight Classification, National Motor Freight Classification or to rules of other carriers applicable to the mode of transportation and shall be suitable for indoor storage at 32°C (90°F) maximum for a minimum of 2 years.

5.2 Marking. In addition to any special marking required by the contract or order (see 6.2), each container shall be marked in accordance with MIL-STD-129 and Code of Federal Regulations 49 CFR 171-179. Marking shall include, but not be limited to, the following information:

a. Title, number and date of this specification
b. Manufacturer's name and location
c. Material trade name
d. Net weight
e. Lot number, batch number(s), and date of manufacture
f. Storage conditions
g. Contract or purchase order number

6. NOTES

6.1 Intended use. Carbon black in accordance with this specification is intended for use as an ingredient in a liner and adhesive composition for the CKU-5/A rocket catapult assembly and other rocket motor applications.

6.2 Ordering data. Procurement documents should specify the following:

6.2.1 Procurement requirements.

a. Title, number and date of this specification
b. Quantity required
c. Place of delivery
d. Inspection conditions when other than as specified (see 4.2)
e. Lot size if other than as specified (see 4.3.1)
f. Packaging requirements if other than as specified (see 5.1)
g. Size of container required (see 5.1)
h. Any special markings required (see 5.2)

6.2.2 Contract data requirements. Items of deliverable data required by this specification are cited in the following paragraph herein:

Paragraph	Data Requirement	Applicable DID*
4.4	Quality conformance inspection data	-

*DIDs (Data Item Description/DD Form 1664) for the above requirements will be documented in the applicable ADL (Authorized Data List). Such data will be delivered as identified on completed (numbered) DIDs when specified on DD Forms 1423 (Contract Data Requirements Lists) and incorporated into applicable contracts.

6.2 Suggested source of supply. A product that has met the requirements of this specification in past procurement actions is Acetylene Black, 100% compressed, manufactured by Shawinigan Products Corporation, 111 Charlotte Place, Englewood Cliffs, NJ 07632. This information is for the convenience of the procuring activity and is not to be construed as a waiver of any requirement of this specification nor as any limitation of additional potential sources of supply.

Custodian:
Navy - OS

Preparing Activity:
Navy - OS

Project Number:
6810-NA37

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

OMB Approval
No. 22-R255

INSTRUCTIONS: The purpose of this form is to solicit beneficial comments which will help achieve procurement of suitable products at reasonable cost and minimum delay, or will otherwise enhance use of the document. DoD contractors, government activities, or manufacturers/ vendors who are prospective suppliers of the product are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. 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. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity.

DOCUMENT IDENTIFIER AND TITLE

MIL-C-82665(OS) Carbon Black

NAME OF ORGANIZATION AND ADDRESS

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY DOCUMENT REQUIREMENT CONSIDERED TOO RIGID

3. IS THE DOCUMENT RESTRICTIVE?

☐ YES ☐ NO *(If "Yes", in what way?)*

4. REMARKS

SUBMITTED BY *(Printed or typed name and address - Optional)*

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