

[METRIC]  
A-A-59280  
15 July 1998  
SUPERSEDING  
MIL-I-706A  
17 June 1988

## COMMERCIAL ITEM DESCRIPTION

### IRON OXIDE, FERRIC, RED DRY (NATURAL AND SYNTHETIC)

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. **SCOPE.** This commercial item description (CID) covers two types and two classes of red iron (ferric) oxide for use in the manufacture of pyrotechnic mixtures, propellants, and inert fillers. One type has two classes (see 2).
2. **CLASSIFICATION.** Ferric iron oxide covered by this specification shall be of the following types and classes as specified (see 7.3):

Type I - Synthetic

Class 1 - Coarse  
Class 2 - Fine

Type II - Natural

### 3. SALIENT CHARACTERISTICS

- 3.1 First article. When specified (see 7.3), a first article sample shall be submitted for inspection.

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any data which may improve this document should be sent by letter to: Defense Supply Center Richmond (DSCR), ATTN: DSCR-VBD, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610.
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AMSC N/A

FSC 6810

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3.2 Toxic chemicals, hazardous substances, and ozone depleting substances (ODSs). The use of toxic chemicals, hazardous substances, or ODSs shall be avoided whenever feasible.

3.3 Particle size. The particle size of the ferric oxide ( $\text{Fe}_2\text{O}_3$ ) shall conform to requirements of table I.

TABLE I. Ferric oxide particle size.

U.S.S. Sieve designation	Type I		Type II
	Class 1	Class 2	
	Percent pass through minimum	Percent pass through minimum	Percent pass through minimum
425 $\mu\text{m}$ (No. 40)	100	---	---
150 $\mu\text{m}$ (No. 100)	85	---	---
75 $\mu\text{m}$ (No. 200)	---	---	99.9
45 $\mu\text{m}$ (No. 325)	---	99.0	85.0

Note. All percentages shall be by weight using sieves conforming to American Society for Testing and Materials (ASTM) E 11. The powder shall pass through the required sieves readily without balling or the particles clinging together.

3.4 Properties. The iron oxide shall be a homogeneous crystalline composition and shall be free of lumps and any foreign matter. The properties shall be in accordance with table II.

TABLE II. Properties, by type and percent.

Property	Percent		Test requirement
	Type I	Type II	
Water-soluble material, maximum	0.30	---	3.5.1
Acidity (as $\text{H}_2\text{SO}_4$ ), maximum	0.01	---	3.5.2
Volatile matter, maximum	0.50	1.0	3.5.3
Silica, maximum	0.15	---	3.5.4
Purity (as $\text{Fe}_2\text{O}_3$ ), minimum	98.00	50.0	3.5.5
Calcination loss, maximum	1.50	---	3.5.6

3.5 Tests.

3.5.1 Water-soluble material. Test type I as specified in ASTM D 1208; however, calculate the increase in weight as percent water-soluble material.

3.5.2 Acidity (as  $\text{H}_2\text{SO}_4$ ). Add 100 milliliters (mL) of water to 10 grams (g) of type I sample. Boil, filter, and wash filtrate with hot water. Test filtrate with litmus paper, and if acidic, titrate with 0.1N potassium hydroxide using methyl orange as indicator. Calculate the acidity as sulfuric acid ( $\text{H}_2\text{SO}_4$ ) as follows:

$$\text{H}_2\text{SO}_4, \text{ percent} = \frac{4.9VN}{W}$$

Where,

- V = mL of potassium hydroxide solution used,
- N = normality of potassium hydroxide solution,
- W = weight of sample, g.

3.5.3 Volatile matter. Test type I and II samples as specified in ASTM D 280; however, calculate percent volatile matter as follows for type I:

$$\text{Volatile matter, percent} = \frac{(A-B) 100}{(A-C)}$$

Where,

- A = weight of the weighing bottle and sample, g,
- B = weight of the weighing bottle and dried sample, g,
- C = weight of dry weighing bottle, g.

3.5.4 Silica. Weigh a 5 g sample of type I into a beaker. Add 20 mL of HCl (specific gravity 1.18) and heat to dissolve. Cool, add 30 mL HNO<sub>3</sub> (1:1) and 30 mL of 60 percent perchloric acid. Carefully evaporate the solution to fumes, and then boil for 15 minutes. Caution should be observed in the volatilization of perchloric acid. In order to prevent the accumulation of perchloric acid in the flue of the hood, it is suggested that at this point in the procedure, the acid fumes from the beaker be drawn into a water trap by means of a funnel and suction. Cool, dilute with 125 mL of hot water and stir to dissolve all soluble salts. Filter the solution on No. 40 Whatman paper, or equivalent, wash the residue free of perchloric acid and salts with HCl (1:20), and then with several portions of hot water. Transfer paper and residue to a clean platinum crucible, ignite gently until the filter paper is consumed and finally at a bright red heat. Cool in a desiccator and weigh. Add 3 to 4 drops of H<sub>2</sub>SO<sub>4</sub> (specific gravity 1.84) and approximately 5 mL of hydrofluoric acid. Evaporate to dryness on a hot plate, heat again to a bright red heat, cool and weigh. Calculate the loss in weight between weighings as percent silica.

3.5.5 Purity (as Fe<sub>2</sub>O<sub>3</sub>). Test type I and II samples as specified in ASTM D 50; however, calculate the purity for both types as follows:

$$\text{Purity (as percent Fe}_2\text{O}_3) = \frac{7.985 (V-v)N}{W}$$

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Where,

- V = mL of  $\text{KMnO}_4$  used to titrate the sample,
- v = mL of  $\text{KMnO}_4$  used to titrate the blank,
- N = normality of  $\text{KMnO}_4$  solution,
- W = weight of sample, g.

3.5.6 Calcination loss. Test type I as specified in ASTM D 50.

#### 4. REGULATORY REQUIREMENTS

4.1 Marking, packaging, and labeling. Material shall be labeled, packed, and marked in accordance with Title 49, Code of Federal Regulations (CFR), paragraphs 100 to 185.

4.2 Recycled materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practical, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

4.3 Material safety data sheet (MSDS). An MSDS shall be prepared and furnished in accordance with 29 CFR 1910.1200.

#### 5. QUALITY ASSURANCE PROVISIONS

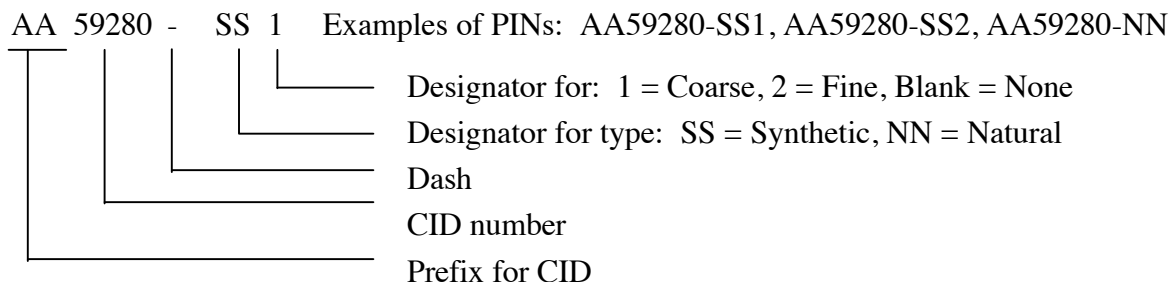
5.1 Product conformance. The product provided shall meet the salient characteristics of this commercial item description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

5.2 Market acceptability. The item offered must have been sold to the government or commercial market.

6. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or order.

7. NOTES. This section contains information of a general or explanatory nature that is helpful, but is not mandatory.

7.1 Part identification number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.



## 7.2 Source of documents.

7.2.1 The CFR and FAR may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.

7.2.2 ASTM standards may be obtained from American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

## 7.3 Ordering data. Acquisition documents must specify the following:

- a. Title, number, and date of this CID.
- b. Type, and class (if appropriate), of red iron oxide required (see 2).
- c. Whether a first article sample is required (see 3.1).
- d. Packaging requirements (see 6).
- e. Unit of issue and quantity.

7.4 National stock number (NSN). The following NSN corresponds to this CID: 6810-00-357-0973. It is for Type II, Natural and may not be indicative of all possible NSNs associated with this document.

7.5 Cross-reference of classification. Table III is a cross-reference of classification changes from MIL-I-706A to this CID.

TABLE III. Cross-reference of classification changes.

MIL-I-706	Amendment 1	A-A-59280
Class 1	Type I, Class 1	Type I, Class 1
Class 2	Type I, Class 2	Type I, Class 2
Class 3	Type II	Type II

### MILITARY INTERESTS:

#### Custodians

Army - AR

Navy - OS

#### Reviewer

Army - EA

### CIVIL AGENCY COORDINATING ACTIVITY:

GSA - 10FTE

Preparing Activity:

DLA - GS

(Project 6810-1487)