

METRIC  
MIL-DTL-382D  
20 January 1998  
SUPERSEDING  
MIL-M-382C(AR)  
10 August 1978

## DETAIL SPECIFICATION

### MAGNESIUM POWDER - FOR USE IN AMMUNITION

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE. This specification covers powdered magnesium suitable for use in ammunition.

#### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any other data which may be of use in improving this document should be addressed to: Defense Supply Center Richmond (DSCR), ATTN: DSCR-VBD, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610 by using Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 6810

Distribution Statement A. Approved for public release; distribution is unlimited.

## MIL-DTL-382

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- B 92M - Standard Specification for Magnesium Ingot and Stick for Remelting [Metric]
- B 329 - Standard Test Method for Apparent Density of Refractory Metals and Compounds by the Scott Volumeter
- E 11 - Standard Specification for Wire-Cloth Sieves for Testing Purposes
- E 300 - Standard Test Method for Sampling Industrial Chemicals

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Classification. The magnesium powder shall be furnished in the following types and granulations (see 6.2):

3.1.1 Types.

Type I - Flaked and/or chipped.

Type II - Oblong chip with rounded edges.

Type III - Granular or spheroidal.

3.1.2 Granulations. The granulations are given in table I.

TABLE I. Granulations.

| Granulation Number | Nominal Mesh Size                     |                     |
|--------------------|---------------------------------------|---------------------|
|                    | Metric                                | U.S.                |
| 1                  | 425 $\mu\text{m}$ - 180 $\mu\text{m}$ | 40 - 80             |
| 2                  | 425 $\mu\text{m}$ - 180 $\mu\text{m}$ | 40 - 80 (alternate) |
| 3                  | 300 $\mu\text{m}$ - 150 $\mu\text{m}$ | 50 - 100            |
| 4                  | 300 $\mu\text{m}$ - 150 $\mu\text{m}$ | 50 - 100 (Army)     |
| 5                  | 300 $\mu\text{m}$ - 125 $\mu\text{m}$ | 50 - 120            |
| 6                  | 180 $\mu\text{m}$ - 125 $\mu\text{m}$ | 80 - 120            |
| 7                  | 150 $\mu\text{m}$                     | 100                 |
| 8                  | 125 $\mu\text{m}$ - 75 $\mu\text{m}$  | 120 - 200           |

## MIL-DTL-382

TABLE 1. Granulations (Continued).

| Granulation Number | Nominal Mesh Size                     |                  |
|--------------------|---------------------------------------|------------------|
|                    | Metric                                | U.S.             |
| 9                  | 106 $\mu\text{m}$                     | 140              |
| 10                 | 75 $\mu\text{m}$                      | 200              |
| 11                 | 180 $\mu\text{m}$ - 75 $\mu\text{m}$  | 80 - 200         |
| 12                 | 125 $\mu\text{m}$ - 75 $\mu\text{m}$  | 120 - 200 (Army) |
| 13                 | 850 $\mu\text{m}$ - 300 $\mu\text{m}$ | 20 - 50          |
| 14                 | 300 $\mu\text{m}$ - 150 $\mu\text{m}$ | 50 - 100         |
| 15                 | 150 $\mu\text{m}$ - 75 $\mu\text{m}$  | 100 - 200        |
| 16                 | 75 $\mu\text{m}$ - 45 $\mu\text{m}$   | 200 - 325        |
| 17                 | 300 $\mu\text{m}$ - 150 $\mu\text{m}$ | 50 - 100         |
| 18                 | 600 $\mu\text{m}$ - 300 $\mu\text{m}$ | 30 - 50          |

3.2 Material. Magnesium powder shall be manufactured from magnesium ingot or stick that meets the requirements of ASTM B 92M, "Standard Specification for Magnesium Ingot and Stick for Remelting [Metric]."

### 3.3 Form.

3.3.1 Type I. Type I magnesium powder shall consist of shavings, turnings, flakes, or any combination of these which meet the necessary granulation requirements shown in table II.

3.3.2 Type II. Type II magnesium powder shall consist of oblong chip-like particles with rounded edges which meet the necessary granulation requirements shown in table II.

3.3.3 Type III. Type III magnesium powder shall consist of granular or spheroidal particles which meet the necessary granulation requirements shown in table II.

3.4 Chemical composition. With the exception of the requirement for the magnesium to be in an ingot or stick form, the magnesium powder shall meet the requirements for grade 9980A of ASTM B 92M.

3.5 First article inspection. This specification contains provisions for first article inspection. Requirements for the submission of first article samples by the contractor shall be as specified in the contract.

## MIL-DTL-382

TABLE II. Granulation requirements<sup>1</sup>.

| Granulation | Max Sieve                | Percent Pass | Min Sieve                | Percent Pass | Density <sup>2</sup><br>(gm/ml) |      |
|-------------|--------------------------|--------------|--------------------------|--------------|---------------------------------|------|
|             |                          |              |                          |              | Max                             | Min  |
| 1           | 600 $\mu$ m<br>(No. 30)  | 100%         | 180 $\mu$ m<br>(No. 80)  | 15%          | 0.65                            | 0.55 |
| 2           | 300 $\mu$ m<br>(No. 50)  | 90%          | 180 $\mu$ m<br>(No. 80)  | 5%           | 0.65                            | 0.55 |
| 3           | 600 $\mu$ m<br>(No. 30)  | 10%          | 150 $\mu$ m<br>(No. 100) | 15%          | 0.75                            | 0.65 |
| 4           | 850 $\mu$ m<br>(No. 20)  | 100%         | 150 $\mu$ m<br>(No. 100) | 12%          | 0.625                           | 0.45 |
| 5           | 425 $\mu$ m<br>(No. 40)  | 100%         | 125 $\mu$ m<br>(No. 120) | 10%          | ---                             | ---  |
| 6           | 212 $\mu$ m<br>(No. 70)  | 100%         | 125 $\mu$ m<br>(No. 120) | 10%          | ---                             | ---  |
| 7           | 150 $\mu$ m<br>(No. 100) | 98%          | ---                      | ---          | ---                             | ---  |
| 8           | 250 $\mu$ m<br>(No. 60)  | 100%         | 75 $\mu$ m<br>(No. 200)  | 10%          | ---                             | ---  |
| 9           | 125 $\mu$ m<br>(No. 120) | 98%          | 75 $\mu$ m<br>(No. 200)  | 0%           | ---                             | ---  |
| 10          | 125 $\mu$ m<br>(No. 120) | 100%         | 75 $\mu$ m<br>(No. 200)  | 90-100%      | ---                             | ---  |
| 11          | 710 $\mu$ m<br>(No. 25)  | 100%         | 75 $\mu$ m<br>(No. 200)  | 25%          | ---                             | ---  |
| 12          | 150 $\mu$ m<br>(No. 100) | 100%         | 75 $\mu$ m<br>(No. 200)  | 85%          | ---                             | 0.45 |
| 13          | 3.35 mm<br>(No. 6)       | 100%         | 300 $\mu$ m<br>(No. 50)  | 5%           | ---                             | 0.45 |
| 14          | 300 $\mu$ m<br>(No. 50)  | 90%          | 150 $\mu$ m<br>(No. 100) | 15%          | ---                             | 0.70 |
| 15          | 300 $\mu$ m<br>(No. 50)  | 100%         | 75 $\mu$ m<br>(No. 200)  | 15%          | 0.75                            | 0.65 |
| 16          | 75 $\mu$ m<br>(No. 200)  | 96%          | 4 $\mu$ m<br>---         | 0%           | ---                             | 0.62 |
| 17          | 600 $\mu$ m<br>(No. 30)  | 100%         | 150 $\mu$ m<br>(No. 100) | 15%          | ---                             | 0.90 |
| 18          | 1.18 mm<br>(No. 16)      | 99%          | 212 $\mu$ m<br>(No. 70)  | 1%           | ---                             | 0.90 |

## MIL-DTL-382

<sup>1</sup>All percentages shall be by weight using sieves conforming to ASTM E 11, "Standard Specification for Wire-Cloth Sieves for Testing Purposes." The powder shall pass through the required sieves readily without balling or the particles clinging together.

<sup>2</sup>Density of the magnesium powder is determined in accordance with ASTM B 329, "Standard Test Method for Apparent Density of Refractory Metals and Compounds by the Scott Volumeter."

#### 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.3).
- b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed on a lot. A lot shall consist of one or more batches of the magnesium powder produced by one manufacturer, in accordance with the same specification, or same specification revision, under one continuous set of operating conditions. Each lot shall consist of that quantity of magnesium powder that has been subjected to the same unit chemical or physical mixing process intended to make the final product homogeneous. In the event the process is a batch operation, each batch shall be a lot.

4.3 First article inspection. The contractor shall submit a first article sample as designated by the contracting officer for evaluation in accordance with the characteristics shown in 3.2, 3.3, and 3.4 when tested in accordance with 4.5. The first article shall consist of 10 kg of the magnesium powder obtained by sampling in accordance with table III. When lots comprise three or less containers, all containers in the lot shall be selected. The samples shall be obtained from a production lot which has been produced by the contractor using the same production processes, procedures and equipment as will be used in fulfilling the contract. All materials, shall be obtained from the same sources of supply as will be used in regular production. Failure of any test, by any sample, shall be cause for rejection of the lot represented.

4.4 Conformance inspection. Conformance inspection shall be performed in accordance with inspection provisions set forth herein. The characteristics shown in 3.2, 3.3 and 3.4 when tested in accordance with 4.5 shall constitute minimum inspections to be performed by the supplier prior to Government acceptance or rejection by lot. Two independent representative samples, approximately two kg, shall be obtained from each lot of magnesium powder using ASTM E 300. Unless otherwise specified, sampling shall be conducted in accordance with table III. When lots comprise three or less containers, all containers in the lot shall be selected. Before sampling, the contents of each container (selected for sampling) shall be thoroughly blended by rolling and turning end for end. Failure of any test, by any sample, shall be cause for rejection of the lot represented. The absence of any inspection requirements in the specification

## MIL-DTL-382

shall not relieve the contractor of the responsibility of assuring that all products or supplies, submitted to the Government for acceptance, comply with all requirements of the contract.

TABLE III. Sampling.

| Number in a Lot |    |        | Number of Samples |
|-----------------|----|--------|-------------------|
| 3               | to | 150    | 3                 |
| 151             | to | 1,200  | 5                 |
| 1,201           | to | 7,000  | 8                 |
| 7,001           | to | 20,000 | 10                |
| 20,001          | to | 35,000 | 15                |
| over 35,000     |    |        | 20                |

4.5 Test methods and procedures.

4.5.1 Component and material inspection. In accordance with 4.3 and 4.4, components and materials shall be inspected in accordance with the “Methods of Analysis” section of ASTM B 92M.

4.5.2 Form. Place a small portion of the sample on a glass slide and examine under a 20 to 30 power microscope.

4.5.3 Granulation. Place a weighed portion of approximately 50 g of the sample on the top sieve of a nest of sieves assembled as specified in table II and provided with a bottom pan. Cover and shake for 30 minutes in a mechanical shaker geared to produce  $300 \pm 15$  gyrations and  $150 \pm 10$  taps of the striker per minute. Weigh the portions retained by each sieve and calculate to a percentage as required.

4.5.4 Apparent density. Determine the apparent density of the magnesium powder, as specified in table II, in accordance with the method described in ASTM B 329.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## MIL-DTL-382

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Magnesium powder covered by this specification is intended for use in the manufacture of tracer, igniter, signal flare and pyrotechnic compositions. Type II material is required for the manufacture of bursting igniters. In general, higher density material will give longer burning times in tracers.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type and granulation required (see 3.1).
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).
- d. Whether a first article sample is required (see 3.5).
- e. Packaging requirements (see 5.1).

6.3 Subject term (key word) listings.

Bursting  
Igniter  
Pyrotechnic  
Signal flare  
Tracer

Custodian:  
Army - GL1

Preparing Activity:  
DLA - GS

(Project No: 6810-1407)

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of 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.

### I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER  
MIL-DTL-382D

2. DOCUMENT DATE (YYMMDD)  
980120

MAGNESIUM POWDER - FOR USE IN AMMUNITION

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

### 5. REASON FOR RECOMMENDATION

### 6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*  
(1) Commercial  
(2) AUTOVON  
*(if applicable)*

7. DATE SUBMITTED  
(YYMMDD)

### 8. PREPARING ACTIVITY

a. NAME  
Defense Supply Center Richmond

b. TELEPHONE *Include Area Code)*  
(1) Commercial (2) AUTOVON  
(804) 279-5019 695-5019

(DSCR) ATTN: DSCR-VBD  
8000 Jefferson Davis Highway  
Richmond, VA 23297-5610