NOTICE: This standard has either been superseded and replaced by a new version or discontinued.
Contact ASTM International (www.astm.org) for the latest information.

Designation: E 753 – 80 (Reapproved 1999)

Standard Specification for Municipal Aluminum Scrap (MAS)[1]

This standard is issued under the fixed designation E 753; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers municipal-refuse originated aluminum alloy scrap (MAS), not source-separated, that is recovered from industrial, commercial, or household wastes destined for disposal facilities.

1.2 Municipal aluminum scrap (MAS) covered by this specification is suitable for use by the following industries:

1.2.1 Secondary aluminum smelters,
1.2.2 Primary aluminum producers,
1.2.3 Aluminum scrap dealers,
1.2.4 Iron and steel industry,
1.2.5 Foundries,
1.2.6 Nonintegrated aluminum producers, and
1.2.7 Independent aluminum fabricators.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* The hazard statement applies only to the test method sections in the annexes of this specification.

2. Referenced Documents

2.1 *ASTM Standards:*

D 2013 Test Method for Preparing Coal Samples for Analysis[2]
E 11 Specification for Wire-Cloth Sieves for Testing Purposes[3]
E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum Alloys[4]
E 101 Test Method for Spectrographic Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique[4]
E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process[3]
E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique[4]
E 276 Test Method for Particle Size or Screen Analysis at No. 4 (4.75-mm) Sieve and Finer for Metal Bearing Ores and Related Materials[4]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *combustible material (organic)*—material that is measured by weight loss of a dried sample input after heating to red heat in an open crucible in a vented furnace. Combustibles include both loose organics and organic coatings.

3.1.2 *loose combustible material (organic)*—loose combustible organics (LCO) that consist of, but are not limited to, nonmetallic materials such as paper, rags, plastic, rubber, wood, food wastes, and yard or lawn wastes, etc., which are not permanently attached to noncombustible objects. The LCOs are defined as material larger than 12 mesh (U.S. Standard Sieve). A determination of LCOs is best done by sampling the material and handpicking, handcleaning, and visually identifying the materials described previously.

3.1.3 *moisture percent*—liquid content, as determined by weight loss when sample material is dried to a constant weight at 110° ± 5°C.

3.1.4 *recovery*—the percent material recovered after an assay using the procedures prescribed in this specification.

4. Classification

4.1 This specification covers two classes based on fines content (7.2) and six grades based on chemical composition of MAS material, as listed in Table 1 (see also 7.2).

5. Ordering Information

5.1 It is recognized that variations in the MAS may occur due to the heterogeneous nature of the solid waste stream. The grades indicated are intended as a means for the purchaser and the seller to establish the value and quality of the MAS.

5.2 MAS shall be considered to be of a particular grade if the value for each element specified, as obtained by the test method agreed upon between the purchaser and seller, does not exceed any of the limits for that grade.

6. Chemical Composition

6.1 The MAS shall conform to the requirements as to

[1] This specification is under the jurisdiction of ASTM Committee D-34 on Waste Disposal and is the direct responsibility of Subcommittee D 34.06 on Recovery and Reuse.

Current edition approved Sept. 2, 1980. Published November 1980.

[2] *Annual Book of ASTM Standards*, Vol 05.05.
[3] *Annual Book of ASTM Standards*, Vol 14.02.
[4] *Annual Book of ASTM Standards*, Vol 03.05.

Copyright © ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, United States.

TABLE 1 Chemical Requirements

Element[A]	Composition, Maximum % Allowable					
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Silicon	0.30	0.30	0.50	1.00	9.00	9.00
Iron	0.60	0.70	1.00	1.00	0.80	1.00
Copper	0.25	0.40	1.00	2.00	3.00	4.00
Manganese	1.25	1.50	1.50	1.50	0.60	0.80
Magnesium	2.00	2.00	2.00	2.00	2.00	2.00
Chromium	0.05	0.10	0.30	0.30	0.30	0.30
Nickel	0.04	0.04	0.30	0.30	0.30	0.30
Zinc	0.25	0.25	1.00	2.00	1.00	3.00
Lead	0.02	0.04	0.30	0.50	0.10	0.25
Tin	0.02	0.04	0.30	0.30	0.10	0.25
Bismuth	0.02	0.04	0.30	0.30	0.10	0.25
Titanium	0.05	0.05	0.05	0.05	0.10	0.25
Others (each)	0.04	0.05	0.05	0.08	0.10	0.10
Others (total)	0.12	0.15	0.15	0.20	0.30	0.30
Aluminum	balance	balance	balance	balance	balance	balance

[A] By agreement between the purchaser and the seller, analysis may be required, and limits established for elements or compounds not specified in this table.

chemical composition prescribed in Table 1 (see Test Methods E 34, E 101, and E 227).

7. Physical Properties

7.1 *Density*—The density for MAS is not specified and shall be agreed upon between the purchaser and the seller.

7.2 *Fineness*—MAS shall contain not more than the amount of minus 12-mesh (U.S. Standard Sieve) (see Specification E 11) material, described in 7.2.1 and 7.2.2.

7.2.1 *Class A* material shall contain not more than 1 weight % fines.

7.2.2 *Class B* material shall contain not more than 3 weight % fines.

7.3 *Loose Combustibles*—MAS shall contain not more than 2.0 weight % of loose combustible material.

7.4 *Moisture*—MAS shall contain not more than 0.5 weight % of moisture.

7.5 *Metal Recovery*— A minimum metal recovery of 85 % is required.

7.6 *Magnetics*—The presence of free magnetic material is not specified and shall be as agreed upon between the purchaser and seller as part of the purchase contract.

8. Sampling

8.1 Sampling shall be in accordance with the procedures described in Annex A1 or Annex A2. Either procedure may be used, as determined by agreement between the purchaser and the seller.

8.1.1 Annex A1 covers sampling at the point of origin.

8.1.2 Annex A2 covers sampling at the point of receipt.

9. Test Methods

9.1 Determine the properties enumerated in this specification in accordance with the following:

9.1.1 *Fineness*—Annex A3.

9.1.2 *Moisture*—Annex A3.

9.1.3 *Metal Recovery*—Annex A3.

10. Rejection and Rehearing

10.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.

11. Shipping

11.1 MAS shall be shipped in rail cars, trailers, or other containers as agreed upon between the purchaser and the seller. The shipping equipment shall be sufficiently watertight to prevent the MAS from becoming wet during shipment.

12. Keywords

12.1 assay; chemical composition; classification system; gross sample; municipal aluminum scrap; physical properties; sampling; test methods; user industries

iTeh Standards
(https://standards.iteh.ai)
Document Preview
ASTM E753-96(1999)
https://standards.iteh.ai/catalog/standards/sist/72e9b0...-4d8a-92e0-553f6c7177f6/astm-e753-801999

ANNEXES

(Mandatory Information)

A1. TEST METHOD FOR COLLECTION OF A SAMPLE OF ALUMINUM SCRAP, RECOVERED FROM MUNICIPAL SOLID WASTE, AND ITS PREPARATION FOR ANALYSIS

A1.1 Scope

A1.1.1 This test method describes procedures for collection of a sample of shredded aluminum metal scrap recovered from municipal refuse, and the shredding, mixing, and secondary sampling of the metal for analysis.

A1.2 Summary of Test Method

A1.2.1 A selected size, gross sample of shredded, nonferrous metal scrap is taken from the metal recovery system conveyor belt in increments. Sample increments are taken at timed intervals from a full cross section of the conveyor while it is stopped or by briefly taking the total flow at the discharge of the conveyor while it is moving.

A1.2.2 The quantity of gross sample may be further reduced by mixing, cone-and-quarter sampling, and riffling.

A1.3 Hazards

A1.3.1 In solids sampling, each step must be designed to eliminate accidental classification by size or gravity. Different sizes usually have different analyses.

A1.3.2 The increments obtained during the sampling period shall be protected from changes in composition due to exposure to the weather.

A1.3.3 Plan the sampling arrangement to avoid contamination of the increments with foreign material.

A1.3.4 A satisfactory sampling arrangement is one that takes an unbiased sample at the desired degree of precision of the constituent for which the sample is to be analyzed. The weight or volume of the collected sample is compared with that of the total lot to assure a constant sampling ratio.

A1.3.5 It is preferable that the nonferrous metal scrap be weighed and sampled at about the same time. If there is a long lapse in time between these two events, both the purchaser and seller should give consideration to changes in moisture during this interval and the consequent shift in relationship of moisture to the true content at the instant when ownership of the nonferrous metal scrap transfers from one to the other.

A1.3.6 Samples and subsamples shall be collected in such a manner that there is no unmeasured loss of moisture of significant amount. The samples shall be weighed before and after drying or other operations to measure all significant weight loss. The material balances shall be adjusted accordingly.

A1.4 Selection of Gross Sample Size

A1.4.1 Choose the gross sample size by methods given in Practice E 122, whenever practicable. The chief difficulty for implementing this practice can be that insufficient information concerning possible variation is available. This information should be gathered with practice. Due to the heterogeneity in size and type of material comprising municipal solid waste, the choice of a large sample is desirable.

A1.5 Taking a Gross Sample

A1.5.1 In order to obtain complete representation of materials in a gross sample, it is desirable that the sample increments be withdrawn from the full cross section of the stream. The best possible increment is either a full cross section removed from a stopped conveyor belt or the total flow at the discharge of the moving conveyor taken during a suitable interval of time.

A1.5.2 The choice of sample size can be estimated using Practice E 122. It is imperative for a given degree of precision that not less than the minimum size and number of sample increments be collected from a lot (see Table A1.1).

A1.5.3 *Number of Gross Samples*—For quantities up to approximately 20 tons (18 000 kg), it is recommended that one gross sample represent the lot. Take this sample in accordance with the requirements prescribed in Table A1.1.

A1.5.4 *Distribution of Increments*—It is essential that the increments be distributed throughout the lot to be sampled. The taking of increments shall be at regularly spaced intervals.

A1.6 Sample Preparation

A1.6.1 Cone and quarter the sample until approximately 2 ft^3 (0.06 m^3) remains. Pile the material to be sampled into a conical heap and then spread out into a circular cake. Divide the cake into quarters, take two of the diagonally opposite quarters as the sample, and reject the two remaining quarters. Collect the two quarters taken as the sample and repeat the procedure of coning and quartering until the desired size is obtained.

A1.6.2 Divide the sample into approximately equal parts. Take one half (1 ft^3) (0.03 m^3) for use in the melt test (see Annex A3). Divide the sample by riffling until the analytical sample is obtained. (Typical riffles can be found in the apparatus section of Test Method D 2013.)

A1.6.3 Store the prepared analytical sample in a covered, labeled, corrosion-resistant metal can or plastic container until needed for chemical analysis.

TABLE A1.1 Number and Weight of Increments for Sampling

	Top Size, in. (mm)		
	⅝ (15)	2 (50)	6 (150)
Minimum number of increments	15	15	15
Minimum weight of increments, lb (kg)	2 (1)	6 (3)	18 (9)

iTeh Standards (https://standards.iteh.ai) Document Preview