



Standard Specification for Municipal Ferrous Scrap¹

This standard is issued under the fixed designation E702; 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 the chemical and physical requirements of municipal ferrous scrap that are intended for use by such industries listed as follows:

- 1.1.1 Copper industry (precipitation process),
- 1.1.2 Iron and steel foundries,
- 1.1.3 Iron and steel production,
- 1.1.4 Detinning industry, and
- 1.1.5 Ferroalloy industry.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 Questions concerning material rejection, downgrading, and retesting based on failure to meet the requirements of this specification shall be dealt with through contractual arrangements between the purchaser and the supplier.

2. Referenced Documents

- 2.1 *ASTM Standards*:²
[E701 Test Methods for Municipal Ferrous Scrap](#)

3. Terminology

- 3.1 *Definitions*:

¹ This specification is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.03 on Treatment, Recovery and Reuse.

Current edition approved Sept. 1, 2015. Published September 2015. Originally approved in 1979. Last previous edition approved in 2010 as E702 – 85 (2010). DOI: 10.1520/E0702-85R15.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.1 *metallic yield*—the weight percent of the municipal ferrous scrap that is generally recoverable as metal or alloy.

3.1.2 *municipal ferrous scrap*—ferrous waste that is collected from industrial, commercial, or household sources and destined for disposal facilities. Typically, municipal ferrous scrap consists of a metal or alloy fraction, a combustible fraction, and an inorganic noncombustible fraction that includes metal oxides.

3.1.3 *total combustibles*—materials that include paints, lacquers, coatings, plastics, etc., associated with the original ferrous product, as well as combustible materials (paper, plastic, textiles, etc.) which become associated with the ferrous product after it is manufactured.

4. Chemical Composition

4.1 Municipal ferrous scrap shall conform to the requirements as to chemical composition for the respective end uses prescribed in [Table 1](#).

4.2 The chemical requirements listed in [Table 1](#) are based on melt analyses except where noted.

5. Physical Properties

5.1 Municipal ferrous scrap shall conform to the physical properties for the respective end uses prescribed in [Table 2](#).

6. Test Methods

6.1 Determine the physical and chemical requirements of municipal ferrous scrap in accordance with Test Methods [E701](#).

7. Keywords

7.1 chemical requirements; copper industry; detinning industry; ferroalloy production; iron and steel foundries; iron and steel production; municipal ferrous scrap; physical requirements

TABLE 1 Chemical Requirements

Element	Composition, %				
	Copper Industry (Precipitation Process)	Iron and Steel Foundries	Iron and Steel Production ^A	Detinning Industry ^B	Ferroalloy Production
Phosphorus, max	...	0.03	0.03	...	0.03
Sulfur, max	...	0.04	0.04	...	...
Nickel, max	...	0.12	0.08	...	...
Chromium, max	...	0.15	0.10	...	0.15
Molybdenum, max	...	0.04	0.025	...	...
Copper, max	...	0.20	0.10	...	0.20
Aluminum, max	...	0.50	0.50	4.00 ^C	0.15
Tin	...	0.30 max ^D	0.30 max	0.15 min ^E	0.30
Lead, max	...	0.03	0.15	...	...
Zinc, max	...	0.06	0.06	...	...
Iron (metallic), min	96.0	...	...	...	...
Silicon, max	0.10	...	...
Manganese, max	0.35
Carbon, max	0.6
Titanium, max	0.025
Total combustibles, max	0.2 ^F	4.0	4.0	...	0.5 ^G
Metallic yield, min	...	90.0	90.0	...	90.0

^A Experience has shown that material which has been incinerated probably will not meet these requirements.

^B A minimum of 95 weight % of the material delivered shall be magnetic. Nonmagnetic material attached to the original magnetic article may be included in the minimum requirement.

^C Not based on melt analyses due to aluminum losses during melting; to be determined by a method mutually agreed upon between the purchaser and supplier.

^D For steel castings, the requirement for tin content is 0.10 max %.

^E Refer to sections on magnetic fraction and chemical analysis of tin in Test Methods E701. Normal separation of white goods and heavy iron yields tin contents equal to or greater than 0.15 weight %. Lesser tin contents would impact severely the value of the scrap to detinners.

^F The scrap shall be appropriately processed (for example, by burning, chemical detinning, etc.) to be virtually free of combustibles.

^G The scrap shall be appropriately processed (for example, by burning, chemical detinning, etc.) to be virtually free of combustibles.

TABLE 2 Physical Requirements

End-Use	Property	
	Bulk Density, lb/ft ³ (kg/m ³)	Form
Copper Industry (Precipitation Process)	30 (480) max	loose, shredded as agreed upon between purchaser and supplier; shall not be baled or baled ^A
Iron and Steel Foundries	50 (800) min	loose, baled, or baled ^B as agreed upon between purchaser and supplier
Iron and Steel Production	75 (1200) min	loose ^C or baled ^B as agreed upon between purchaser and supplier
Detinning Industry	30 (480) max	shredded, 95 weight % shall be - 6, + 1/2 in. (-152, + 12.5 mm); shall not be baled, baled, burned, incinerated, or pyrolyzed
Ferroalloy Production	50 (800) min	loose, as agreed upon between purchaser and supplier

^A Various consumers may establish gage limitations on the material they purchase.

^B Industry practice is to specify a maximum bale size that may vary among users.

^C Experience has shown that if the size range is 95 weight %, - 2, + 1/4 in. (-50, + 6.3 mm), the bulk density requirement can be met and the material will be loose and free flowing.

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; http://www.copyright.com/