Designation: E 702 – 85 (Reapproved 1999)

Standard Specification for Municipal Ferrous Scrap[1]

This standard is issued under the fixed designation E 702; 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 is 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 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:*

E 701 Test Methods for Municipal Ferrous Scrap[2]

3. Terminology

3.1 *Definitions:*

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 E 701.

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

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[1] This specification is under the jurisdiction of ASTM Committee D-34 on Waste Disposal and is the direct responsibility of Subcommittee D34.06 on Recovery and Reuse.

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[2] *Annual Book of ASTM Standards*, Vol 11.04.

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 E 701. 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 balled or baled[A]
Iron and Steel Foundries	50 (800) min	loose, balled, 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, + ½ in. (−152, + 12.5 mm); shall not be balled, 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, + ¼ in. (−50, + 6.3 mm), the bulk density requirement can be met and the material will be loose and free flowing.