

# Standard Specification for Waste Glass as a Raw Material for the Manufacture of Glass Containers<sup>1</sup>

This standard is issued under the fixed designation E708; 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 ( $\varepsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

- 1.1 This specification covers particulate glass (cullet material, recovered from waste destined for disposal, smaller than 6 mm intended for reuse as a raw material in the manufacture of glass containers.
- 1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.
- 1.2.1 *Exception*—The values given in parentheses are for information only.

### 2. Referenced Documents

2.1 ASTM Standards:<sup>2</sup>

C162 Terminology of Glass and Glass Products

C169 Test Methods for Chemical Analysis of Soda-Lime and Borosilicate Glass

E688 Test Methods for Waste Glass as a Raw Material for Glass Manufacturing

# 3. Terminology

- 3.1 Definitions:
- 3.1.1 flint glass cullet—a particulate glass material that contains no more than 0.1 weight %  $Fe_2O_3$ , or 0.0015 weight %  $Cr_2O_3$ , as determined by chemical analysis.
- 3.1.2 For definitions of other terms used in this specification, refer to Terminology C162.

### 4. Representative Sample

4.1 The following requirements qualify the glass lot to be used for direct use in soda-lime glass container manufacturing. Sample should be prepared and examined in accordance with Test Methods E688.

Note 1—A preponderant proportion of glass cullet will be soda-lime bottle glass, the glass cullet having a composition as follows, as determined by Test Methods C169.

Oxide	Composition, Weight %
SiO <sub>2</sub>	66 to 75
$Al_2O_3$	1 to 7
CaO + MgO	9 to 13
Na <sub>2</sub> O	12 to 16

Note 2—All percents referred to in this specification are weight percents.

# 5. General Requirements

- 5.1 The sample shall show no drainage of liquid and be noncaking and free flowing. A moisture content of less than 0.5 weight % is required to meet the free-flowing characteristics of a cullet that is predominantly of smaller particle size, 1.18-mm (No 16) sieve or smaller.
- 5.2 *Screen Size*—No material shall be retained on a 6-mm (¼-in.) screen. Material not exceeding 15 weight % shall pass through a 106-µm (No. 140) screen.
- 5.3 Organic Materials—The total content of organic materials, as measured in accordance with Section 6 shall not exceed 0.2 weight % of dry sample, except for color-mixed glass where the content of organic material may exceed 0.2 weight %. However, a content of organic material greater than 0.2 weight % must be held within a tolerance of  $\pm 0.05$  weight %, with a maximum organic limit of 0.4 weight %.
- 5.4 *Magnetic Materials*—The total magnetic materials shall not exceed 0.05 weight % of dry sample weight for flint glass and 0.14 weight % for colored glass of dry sample weight in accordance with Section 6.
- 5.5 Permissible Color Mix for Color Sorted Glass Cullet by Weight:
  - 5.5.1 Amber Glass Cullet:

90 to 100 % amber 0 to 10 % flint 0 to 10 % green 0 to 5 % other colors

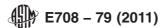
5.5.2 Green Glass Cullet:

50 to 100 % green 0 to 35 % amber 0 to 15 % flint 0 to 4 % other colors

<sup>&</sup>lt;sup>1</sup> 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.

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<sup>&</sup>lt;sup>2</sup> 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.



5.5.3 Flint Glass Cullet:

95 to 100 % flint 0 to 5 % amber 0 to 1 % green 0 to 0.5 % other colors

- 5.5.3.1 Percents above 0.1 weight % of  $Fe_2O_3$  or 0.0015 weight % of  $Cr_2O_3$ , or both, as determined by chemical analysis shall be considered mixed color glass. These limits are consistent with industry experience on raw material.
- 5.5.3.2 Flint glass cullet may contain up to 1 weight % emerald green or 10 weight % Georgia green, or a combination within the limits: 1 % Georgia green = 0.1 % emerald green.
- 5.6 Other Inorganic Material (such as nonmagnetic metals or refractories)—As measured, material larger than 850-μm (No. 20) screen size shall not exceed 0.1 % of the dry sample

weight. Material smaller than 850- $\mu$ m screen size shall not exceed 0.5 % of the dry sample weight.

5.6.1 *Refractories*—Based upon U.S. series screen size and sample weight, the following refractory particle limits shall apply for each screen fraction as stated below.

-40, +60 mesh 20 refractory particles per 450-g (1-lb) sample

5.6.2 Nonmagnetic Metals:—

+20 mesh 1 particle per 18-kg (40-lb) sample

Upon failure to meet the previously stated specification limits, retesting is permissible.

# 6. Sampling and Testing

6.1 Sampling and testing shall be in accordance with Test Methods E688.

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