



Designation: C545 – 97 (Reapproved 2022)

Standard Classification of Zircon Refractories¹

This standard is issued under the fixed designation C545; 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 classification covers fired refractory brick and shapes consisting predominantly of zircon ($ZrO_2 \cdot SiO_2$) and containing, by chemical analysis, not less than 60 % zirconium oxide (ZrO_2) and not less than 30 % silica (SiO_2).

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 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

C20 Test Methods for Apparent Porosity, Water Absorption, Apparent Specific Gravity, and Bulk Density of Burned Refractory Brick and Shapes by Boiling Water

C830 Test Methods for Apparent Porosity, Liquid Absorption, Apparent Specific Gravity, and Bulk Density of Refractory Shapes by Vacuum Pressure

NOTE 1—Chemical analysis of refractory products is determined by a combination of X-ray fluorescence (XRF) and inductively coupled plasma (ICP) using standard reference materials (SRM), including various types

¹ This classification is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.92 on The Joseph E. Kopanda Subcommittee for Editorial, Terminology and Classification.

Current edition approved Sept. 1, 2022. Published September 2022. Originally approved in 1964. Last previous edition approved in 2018 as C545 – 97 (2018). DOI: 10.1520/C0545-97R22.

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.

of minerals and refractory materials which are available from the National Institute of Standards and Technology and other appropriate sources.

3. Significance and Use

3.1 The zircon content and bulk density of a zirconia-silica refractory material have important influences on chemical resistance and its satisfactory use in refractory applications. This classification is considered useful for purchase specifications and quality control.

4. Basis of Classification

4.1 Types:

4.1.1 *Type A (Regular)*—Zircon refractories having a bulk density of less than 240 lb/ft³ (3.84 g/cm³).

4.1.2 *Type B (Dense)*—Zircon refractories having a bulk density of 240 lb/ft³ (3.84 g/cm³) or more.

5. Test Methods

5.1 The properties listed in this classification shall be determined by the following ASTM methods:

5.1.1 *Bulk Density*—Test Methods C20 or C830.

5.1.2 *Chemical Analysis*—XRF and ICP.

6. Retests

6.1 Because of variables resulting from sampling and the lack of satisfactory reproducibility in tests conducted by different laboratories, the material may be resampled and retested when requested by either the manufacturer or the purchaser. This may apply in instances when the first test results do not conform to the requirements prescribed in this classification. The final results to be used shall be the average of at least two sets of results, each of which has been obtained by following in detail the specified testing procedures.

7. Keywords

7.1 classification; refractories; zircon; zirconia-silica

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/>

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ASTM C545-97\(2022\)](#)

<https://standards.itih.ai/catalog/standards/sist/ba96138d-78f0-40fc-9baf-5b8120bb09d9/astm-c545-972022>