



Designation: F109 – 12 (Reapproved 2018)

## Standard Terminology Relating to Surface Imperfections on Ceramics<sup>1</sup>

This standard is issued under the fixed designation F109; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This terminology describes and illustrates imperfections observed on whitewares and related products. For additional definitions of terms relating to whitewares and related products, refer to Terminology C242. To observe these defects, examination shall be performed visually, with or without the aid of a dye penetrant, as described in Test Method C949. Agreement by the manufacturer and the purchaser regarding specific techniques of observation is strongly recommended.

1.2 *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:*<sup>2</sup>

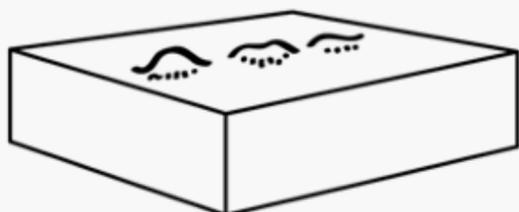
C242 Terminology of Ceramic Whitewares and Related Products

C949 Test Method for Porosity in Vitreous Whitewares by Dye Penetration

E165 Practice for Liquid Penetrant Examination for General Industry

### 3. Terminology

**blemish**—strained or discolored area attributable to normal composition or forming, or both. (See also **inclusion**.)



<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Products and is the direct responsibility of C21.01 Editorial and Terminology on Nomenclature.

Current edition approved Feb. 1, 2018. Published February 2018. Originally approved in 1969. Last previous edition approved 2012 as F109 – 12. DOI: 10.1520/F0109-12R18.

<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.

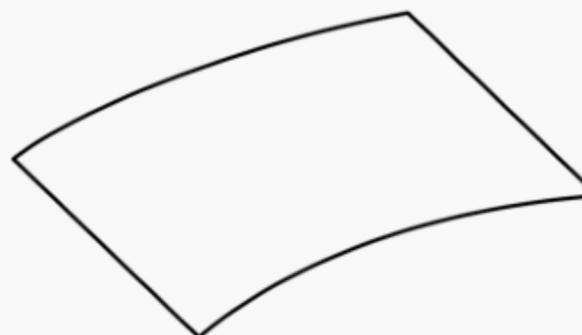
**blister**—bubble or gaseous inclusion at the surface which if broken could form a pit, pock, or hole.



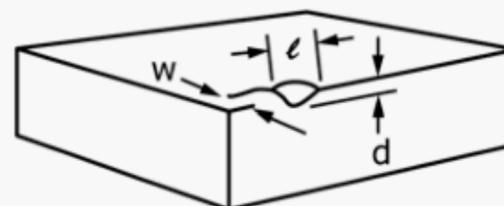
**burr**—fragment of excess material or foreign particle adhering to the surface.



**camber**—a single arch of curvature. (See also **waviness**.)



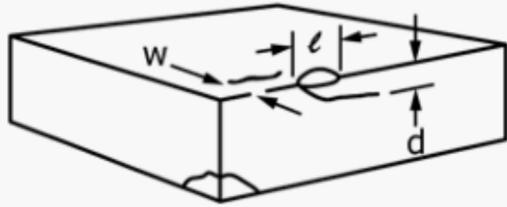
**chip**—area along an edge or corner where the material has broken off.



where:

$w$  = width  
 $l$  = length, and  
 $d$  = depth.

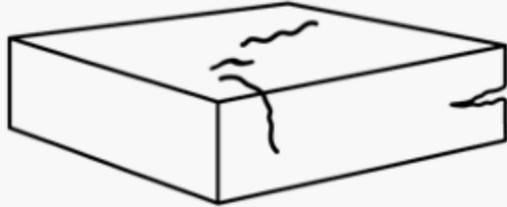
**closed chip**—fractured area on the edge or corner when the material has not broken off (Syn. *potential chip*).



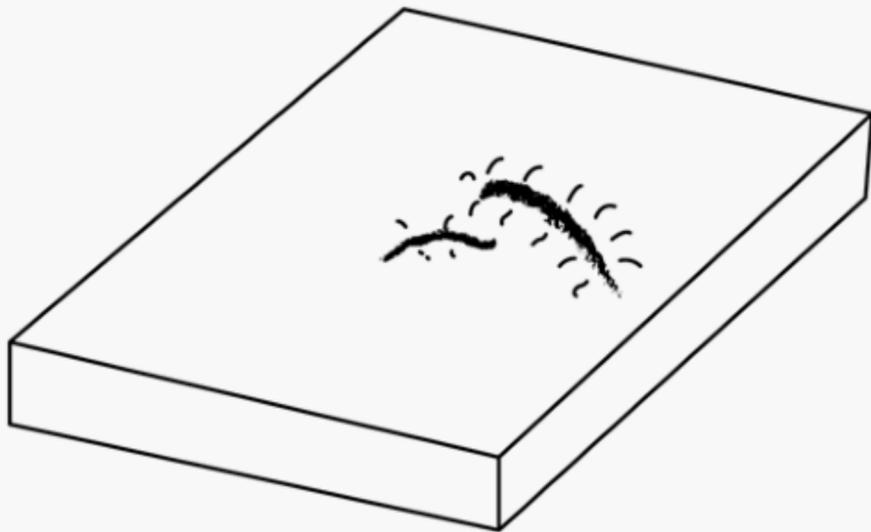
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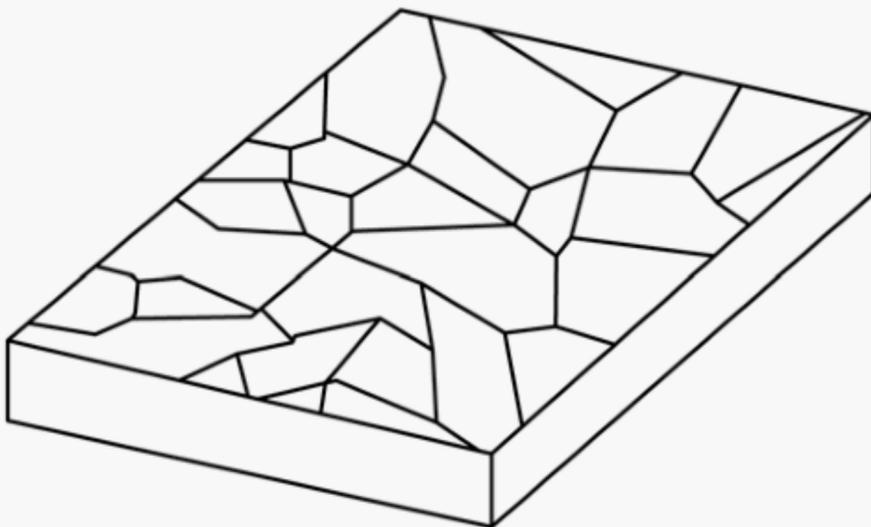
**crack**—line of fracture without complete separation.



**crawling**—a parting and contraction of the glaze on the surface of ceramic ware during drying or firing, resulting in unglazed areas bordered by coalesced glaze.



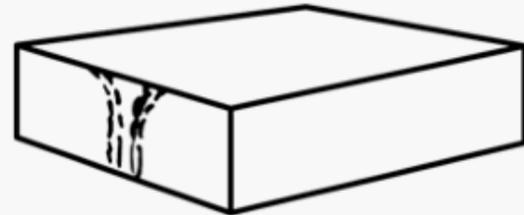
**crazing**—the cracking that occurs in fired glazes or other ceramic coatings as a result of tensile stresses, may also occur in the surface portion of uncoated (unglazed) white-ware bodies.



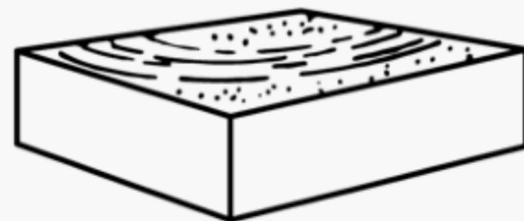
**fin**—fine feather-edge protrusion from the surface (Syn. *flash*).



**flow line**—one or more streaks distinguished by a difference in light reflectance from the surrounding area, characteristic of injection-molded parts. (See also **weld mark**.)



**grinding mark**—a pattern of fine striations or scoring, usually directional, resulting from machining, as distinct from **surface marks**

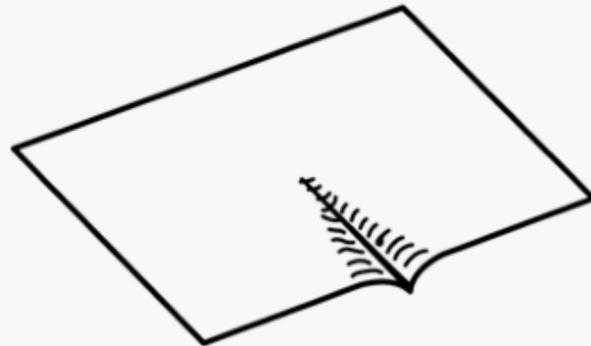


**hole**—a deep depression or void, the bottom of which is not visible by normal (20/20) vision under 200 fc illumination.



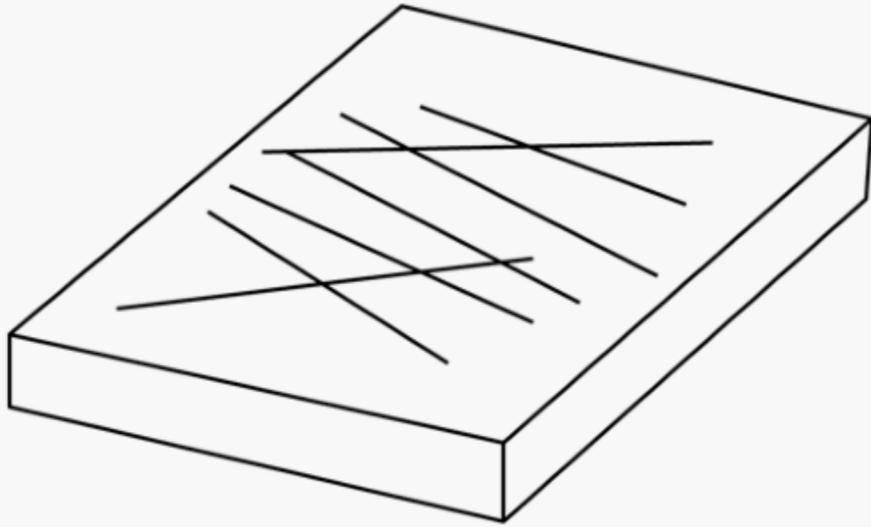
**inclusion**—embedded foreign material or a stain other than from normal composition or forming, or both (see **blemish**).

**kink**—a type of waviness occurring interior to the edges, not to be confused with the more abrupt departures as ridges or surface marks. (See also **waviness**.)

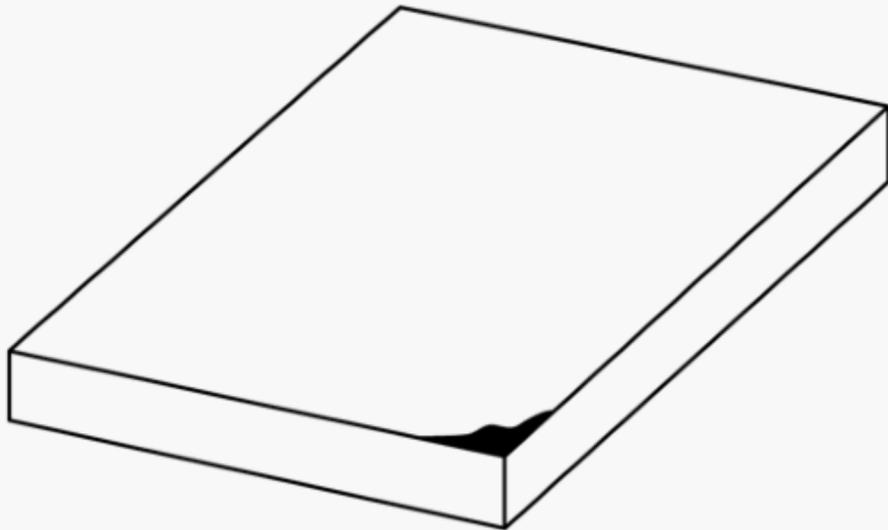


**lump**—a raised area on the surface having the appearance of being solid.

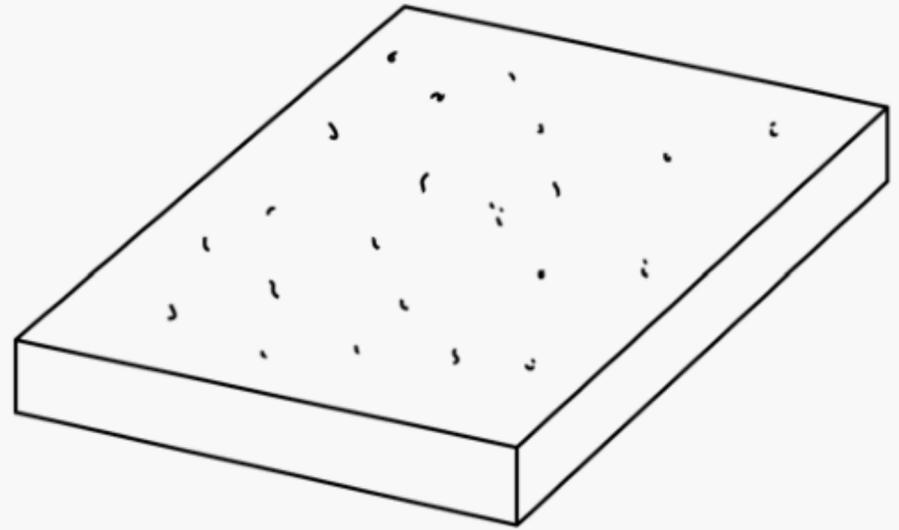
**metal marks**—lines on the surface of a ceramic body or glaze caused by drawing a hard metal, such as a knife, across the surface.



**peeling**—compressive stresses in a fired glaze or other ceramic coating of sufficient magnitude to exceed the strength of adhesion between the glaze and the body.



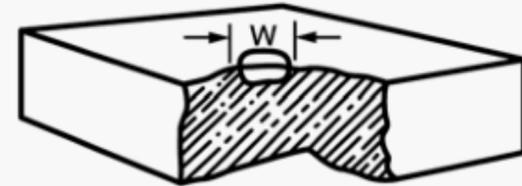
**pinholes**—imperfections in the surface of a ceramic glaze resembling pin pricks.



**pit**—a shallow depression or crater in which all surfaces are visible by normal (20/20) vision under 200 fc of illumination.



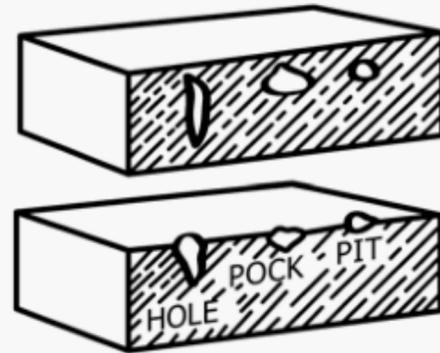
**pock**—a partially closed surface cavity.



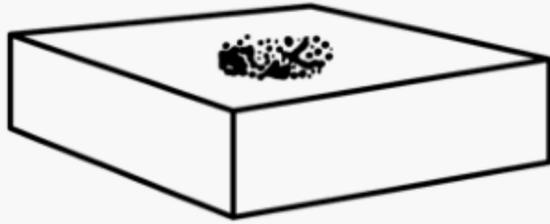
where:

$w$  = width.

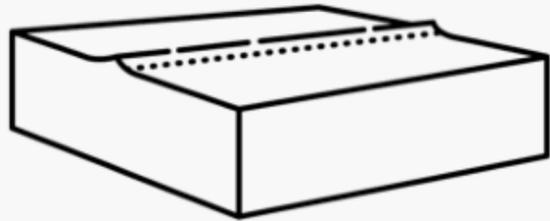
**pore**—an internal cavity which may be exposed by cutting, grinding, or polishing to become a pit, pock, or hole.



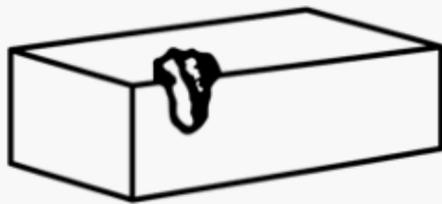
**porous area**—an area that will retain dye when tested in accordance with Practice E165 and, if broken through at the porous area, will show evidence of dye penetration into the body.



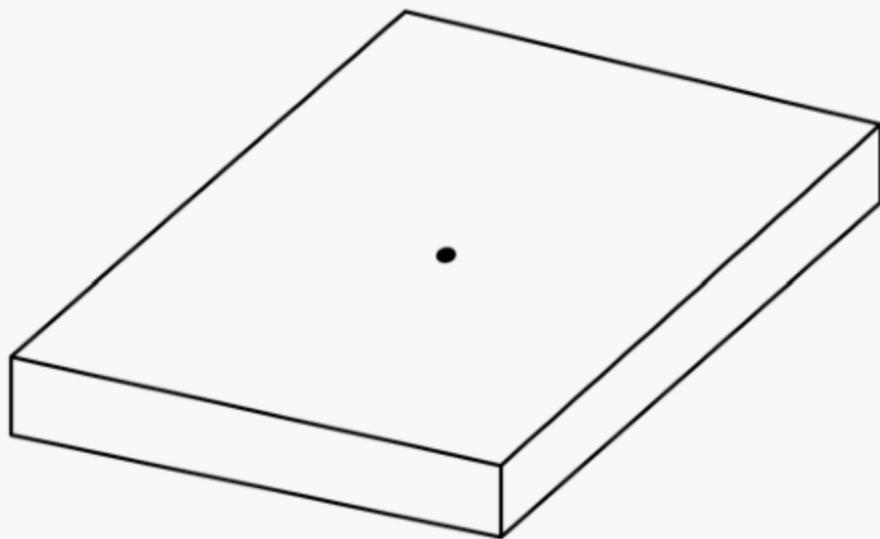
**ridge**—long, narrow protrusion on any surface.



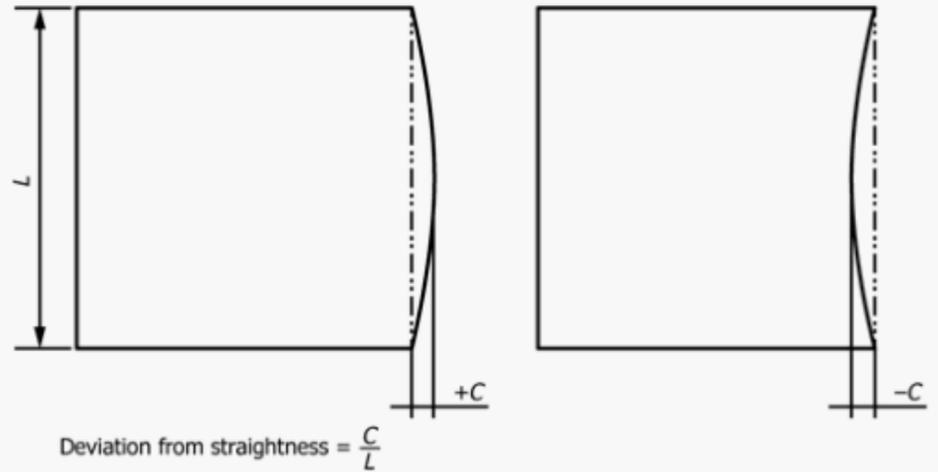
**rim**—a protrusion, usually of base material, bordering either partially or completely a hole, pit, or pock.



**speck**—a discrete particle of unreacted or unwanted material in a ceramic body or glaze.



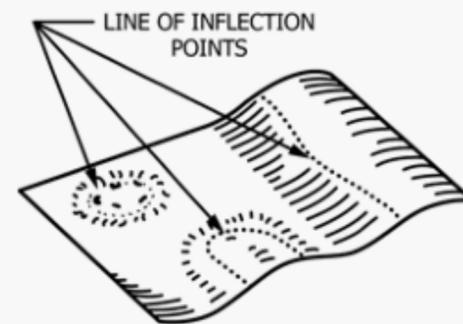
**straightness of sides**—the deviation from straightness of the center of the side in the plane of the tile, as measured by a wedging apparatus (C-502). The measurement is only relevant to the straight sides of tiles.



**surface marks**—relatively long, narrow, shallow grooves or cuts in the surface, such as scratches, score marks, and machining marks. (See also **grinding mark**)



**waviness**—a long-order departure from flatness as opposed to sharp discontinuities. Amplitude is in excess of specified surface finish. In general, waviness will exhibit a number of inflection points that, if connected, would form a line whose path may be open or closed (Syn. *warp*).



**weld mark**—a deep groove or fissure formed by incomplete union of two or more particles or streams of material flowing together.



 **F109 – 12 (2018)**

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