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Standard Terminology Relating to Wear and Erosion[1]

This standard is issued under the fixed designation G40; 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 The terms and their definitions given herein represent terminology relating to wear and erosion of solid bodies due to mechanical interactions such as occur with cavitation, impingement by liquid jets or drops or by solid particles, or relative motion against contacting solid surfaces or fluids. This scope interfaces with but generally excludes those processes where material loss is wholly or principally due to chemical action and other related technical fields as, for instance, lubrication.

1.2 This terminology is not exhaustive; the absence of any particular term from this collection does not necessarily imply that its use within this scope is discouraged. However, the terms given herein are the recommended terms for the concepts they represent unless otherwise noted.

1.3 Certain general terms and definitions may be restricted and interpreted, if necessary, to make them particularly applicable to the scope as defined herein.

1.4 The purpose of this terminology is to encourage uniformity and accuracy in the description of test methods and devices and in the reporting of test results in relation to wear and erosion.

NOTE 1—All terms are listed alphabetically. When a subsidiary term is defined in conjunction with the definition of a more generic term, an alphabetically-listed cross-reference is provided.

1.5 *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 ~~Standard:~~Standards:*[2]

C242 Terminology of Ceramic Whitewares and Related Products

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

3. Terminology

abradant, *n*—a material that is producing, or has produced, abrasive wear.

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[1] This terminology is under the jurisdiction of ASTM Committee G02 on Wear and Erosion and is the direct responsibility of Subcommittee G02.91 on Terminology.

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[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.

abrasion, *n*—in tribology, the process by which relative motion between a surface and hard particles or protuberances on an opposing surface produces abrasive wear of that surface. (See also **abrasive wear**.)

abrasive wear, *n*—wear due to hard particles or hard protuberances forced against and moving along a solid surface.

abrasion-corrosion, *n*—a synergistic process involving both abrasive wear and corrosion in which each of these processes is affected by the simultaneous action of the other and, in many cases, is thereby accelerated.

abrasivity, *n*—the ability of a material or substance to cause abrasive wear.

absolute impact velocity—See **impact velocity**.

acceleration period, *n—in cavitation and liquid impingement erosion*, the stage following the incubation period during which the erosion rate increases from near zero to a maximum value. (See also **erosion rate-time pattern**.)

accumulation period, *n—in cavitation and liquid impingement erosion*, a less-preferred term for **acceleration period**.

adhesive wear, *n*—wear due to localized bonding between contacting solid surfaces leading to material transfer between the two surfaces or loss from either surface.

angle of attack, *n—in impingement erosion*, the angle between the direction of motion of an impinging liquid or solid particle and the tangent to the surface at the point of impact.

angle of incidence, *n—in impingement erosion*, the angle between the direction of motion of an impinging liquid or solid particle and the normal to the surface at the point of impact.

apparent area of contact, *n—in tribology*, the area of contact between two solid surfaces defined by the boundaries of their macroscopic interface. (Contrast with **real area of contact**.)

asperity, *n—in tribology*, a protuberance in the small-scale topographical irregularities of a solid surface.

attenuation period, *n—in cavitation and liquid impingement erosion*, a less-preferred term for **deceleration period**.

average erosion rate, *n*—a less preferred term for **cumulative erosion rate**. (See also **interval erosion rate**.)

Beilby layer, *n*—an altered surface layer of supposedly amorphous material formed on a crystalline solid during mechanical polishing, whose existence was proposed in Sir George Beilby's writings. The existence of such a layer is not supported by recent research, and the use of this term is therefore considered archaic and is strongly discouraged.

bio-tribocorrosion, *n*—in the field of medical devices and dental restoratives, a form of tribocorrosion in which biological substances make up one or more of the triboelements or are present in the contact region between them.

break-in,*n*—See **run-in**.

break in,*v*—See **run in**.

brinelling, *n*—damage to a solid bearing surface characterized by one or more plastically formed indentations caused by static or impulsive overloads, especially as found in rolling contact bearings. (See also **false brinelling**.)