Designation: G 73 – 98

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Practice for Liquid Impingement Erosion Testing[1]

This standard is issued under the fixed designation G 73; 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 practice concerns tests in which solid specimens are eroded or otherwise damaged by repeated discrete impacts of liquid drops or jets. Among the collateral forms of damage considered are degradation of optical properties of window materials, and penetration, separation, or destruction of coatings. The objective of the tests may be to determine the resistance to erosion or other damage of the materials or coatings under test, or to investigate the damage mechanisms and the effect of test variables. Because of the specialized nature of these tests and the desire in many cases to simulate to some degree the expected service environment, the promulgation of a method is not deemed practicable. This practice gives guidance in setting up a test, and specifies test and analysis procedures and reporting requirements that can be followed even with quite widely differing materials, test facilities, and test conditions. It also provides a standardized scale of erosion resistance numbers applicable to metals and other structural materials.

1.2 The values stated in SI units are to be regarded as standard. The inch-pound units in parentheses are provided for information.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 1003 Test Method for Haze and Luminous Transmittance of Transparent Plastics[2]

E 92 Test Method for Vickers Hardness of Metallic Materials[3]

E 140 Hardness Conversion Tables for Metals (Relationship Between Brinell Hardness, Vickers Hardness, Rockwell Hardness, Rockwell Superficial Hardness, and Knoop Hardness)[3]

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods[4]

E 179 Guide for Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials[5]

G 1 Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens[6]

G 32 Test Method for Cavitation Erosion Using Vibratory Apparatus[6]

G 40 Terminology Relating to Wear and Erosion[6]

G 134 Test Method for Erosion of Solid Materials by a Cavitating Liquid Jet[6]

2.2 *Military Standards:*

MIL-C-83231 Coatings, Polyurethane, Rain Erosion Resistance for Exterior Aircraft and Missile Plastic Parts[7]

MIL-P-8184 Plastic Sheet, Acrylic, Modified[7]

3. Terminology

3.1 See Terminology G 40 for definitions of terms relating to erosion by liquids and solids. Important terms used in this practice, or that might be used in a test report following this practice, are defined in either 3.2 or 3.3. Definitions of selected terms quoted from Terminology G 40 are listed in 3.2. Definitions of terms specific to this practice are presented in 3.3.

3.2 *Definitions*—All definitions listed below are quoted from Terminology G 40 – 98.

3.2.1 *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*.)

3.2.2 *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.

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

3.2.4 *catastrophic period, n— in cavitation or liquid impingement erosion*, a stage during which the erosion rate increases so drastically that continued exposure threatens or

[1] This practice is under the jurisdiction of ASTM Committee G-2 on Wear and Erosion and is the direct responsibility of Subcommittee G02.10 on Erosion by Solids and Liquids.

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[2] *Annual Book of ASTM Standards,* Vol 08.01.

[3] *Annual Book of ASTM Standards,* Vol 03.01.

[4] *Annual Book of ASTM Standards,* Vol 14.02.

[5] *Annual Book of ASTM Standards,* Vol 06.01.

[6] *Annual Book of ASTM Standards,* Vol 03.02.

[7] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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