

# ASTM journal of testing and evaluation

## Editorial Objectives

The *Journal of Testing and Evaluation* is published bimonthly by ASTM, a nonprofit technical association that develops and publishes voluntary consensus standards for materials, products, systems, and services. All contributions are peer reviewed prior to publication.

The editorial objectives of this journal are to serve a broad-based audience by:

1. Publishing new technical information derived from the field and laboratory testing, performance, quantitative characterization, and evaluation of these materials, products, systems, and services.
2. Presenting new methods and data and critical evaluations of these methods and data.
3. Reporting the users' experience with test methods and the results of interlaboratory testing and analysis.
4. Providing the scientific basis for both new and improved ASTM standards.
5. Stimulating new ideas in the fields of testing and evaluation.

## Technical Editor

Alan Wolfenden  
Mechanical Engineering Department  
Texas A&M University  
College Station, TX 77843

## Editorial Board

James C. Abbott  
Procter and Gamble Company  
Committee D-6 on Paper and Paper Products

Ben M. Hillberry  
School of Mechanical Engineering  
Purdue University  
Committee E-9 on Fatigue

Theodore J. Louzon  
AT&T Bell Laboratories  
Committee B-5 on Copper and Copper Alloys

George V. Aseff, Sr.  
Law Engineering Testing Company  
Committee E-40 on Technical Aspects of Products Liability Litigation

William H. Hunley  
Naval Architecture Engineering  
CASDE  
Committee F-25 on Shipbuilding

Donald R. Petersen  
The Dow Chemical Company  
Committee D-32 on Catalysts

Ray Bartnikas  
Hydro Quebec Institute of Research  
Materials Science Research  
Committee D-9 on Electrical Insulating Materials

William E. Irwin  
Armstrong World Industries, Inc.  
Committee F-6 on Resilient Floor Coverings

Robert S. Shane  
Shane Associates, Inc.  
Committee F-15 on Consumer Products

Robert J. Goode  
Naval Research Laboratory  
Committee E-24 on Fracture Testing

Larry P. Jackson  
Western Research Institute  
Committee D-34 on Waste Disposal

Everett C. Shuman  
Pennsylvania State University  
Institute for Building Research (retired)  
Committee C-16 on Thermal Insulation

Tibor Z. Harmathy  
Division of Building Research  
National Research Council of Canada  
Committee E-5 on Fire Standards

Morris Loeff  
County College of Morris  
Committee E-6 on Performance of Building Constructions

P. Aarne Vesilind  
Department of Civil Engineering  
Duke University  
Committee E-38 on Resource Recovery

Richard J. Wallace  
Daniel Construction Company  
Committee D-8 on Roofing, Waterproofing, and Bituminous Materials

The American Society for Testing and Materials is not responsible, as a body, for the statements and opinions advanced in this publication.

*Journal of Testing and Evaluation* (ISSN 0090-3973) is published bimonthly by ASTM as part of the Testing and Evaluation Series, which includes the *Geotechnical Testing Journal* (published quarterly) and *Cement, Concrete, and Aggregates* (published semiannually). Publication and editorial office at the Headquarters of the Society, 1916 Race St., Philadelphia, PA 19103.

**Subscriptions:** *United States and Canada* for 1 year \$40.00 (members \$30.00), for 2 years \$70.00 (members \$52.00), and for 3 years \$90.00 (members \$69.00). *Foreign* for 1 year \$45.00 (members \$34.00), for 2 years \$80.00 (members \$60.00), and for 3 years \$105.00 (members \$81.00). Single copies are \$14.00. To subscribe, please send prepaid order to ASTM, Subscription Dept., JTE, 1916 Race St., Philadelphia, PA 19103. *Journal of Testing and Evaluation* is indexed regularly by Engineering Index, Inc., and is available on microfilm from University Microfilms, a Xerox Co., Ann Arbor, MI. Second class postage paid at Philadelphia, PA. Copyright 1986 by the American Society for Testing and Materials.

**Permission to Copy:** The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc., Operations Office, P.O. Box 765, Schenectady, NY 12301, for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. (The per copy fee appears as the last four digits of the code at the bottom of the first page of each article.) This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Further information may be obtained from the Copyright Clearance Center's Administrative Office, 310 Madison Ave., New York, NY 10017 (212/697-2525).

**Postmaster:** Send Form 3579 to Subscription Dept. ASTM Headquarters, 1916 Race St., Philadelphia, PA 19103.

**Change of Address:** Please return entire addressing label on wrapper to ASTM, Subscription Dept., JTE, 1916 Race St., Philadelphia, PA 19103, along with new address.

## Editorial Staff

Allan S. Kleinberg, *Senior Assistant Editor*  
Bette Grugan, *Secretary, Acquisition & Review*  
Kathy Greene, *Manager, Acquisition & Review*  
Bill Benzing, *Manager, Editorial*  
Janet R. Schroeder, *Managing Editor*  
M. Bruce Vieth, *Manager of Production*  
Robert L. Meltzer, *Vice-President, Publications and Marketing*

## ASTM Officers

Gladys B. Berchtold, *Chairman*  
Robert Baboian, *Vice-Chairman*  
W. DeWayne France, Jr., *Vice-Chairman*  
David M. Greason, *Treasurer*  
Joseph G. O'Grady, *President*

### DIRECTORS

Kenneth E. Benson	John F. McLaughlin
John A. Blair	John A. Millane
Jack A. Bono	Thomas D. Moreland
F. Greg Clarke	Donald M. Preiss
Howard I. Forman	Theodore P. Pritsker
John A. Gilligan	Kenneth L. Reifsnider
John A. Heslip	Peter E. Schilling
John W. Lyons	Richard A. Stimson
Robert W. Macdonald	Conrad J. J. Zellweger

### PAST CHAIRMEN

Lendell E. Steele	Robert G. Redelfs
-------------------	-------------------

## Committee on Publications

Robert C. Deen, <i>Chairman</i>	Richard Kimerle
Kenneth L. Reifsnider, <i>Vice-Chairman</i>	Edwin L. Lewis
John M. Barsom	Leonard Mordfin
Edward P. Bartkus, <i>Ex-officio</i>	James S. Perrin
Sheldon W. Dean	Clifford G. Scott
William G. Dukek	Pamela G. Sullivan
	Robert E. White

## Information for Authors

The *Journal of Testing and Evaluation* publishes original articles of the following types:

### Full-Length Papers (3000-5000 words)

- Reports of Original Investigations (research and field applications papers).
- Review Articles (state-of-the-art or literature reviews).
- Interlaboratory Research Reports (including data and statistical analysis).
- New Procedures (currently under development by a committee or authored by an individual).
- Case Studies (reports and analyses of noteworthy events or situations).

### Shorter Technical Communications (500-1500 words)

- Technical Notes (brief papers on specific topics).
- Research Briefs (advance communications that will be followed by full-length papers).
- Conference Reports (extended abstracts).

### Commentary (500-1000 words)

- Discussions of Previously Published Papers.
- Letters to the Editor.
- Invited Editorials.
- Reviews of Books and Standards.

The subject matter must not be of a speculative nature and the contents must not include materials of an advertising nature. The paper must not be seriously defective as to literary form and structure, continuity of thought, and clarity of expression. The substance of the paper should not have been published previously in the open literature.

Authors preparing papers for submittal should observe the conventions of style explained in the ASTM Style Manual. Since the journal does not request page charges, the author is expected to conform to these standard conventions for style. SI units are to be used throughout; if data were not measured in SI units, a note should appear to that effect and the original units should be included in parentheses after the SI units.

The original manuscript and four clear copies, including original illustrations, should be submitted to Kathy Greene, Manager, Acquisitions and Review, ASTM, 1916 Race St., Philadelphia, PA 19103.