EDITOR'S NOTE:

This issue of the World of Composites will again begin with a review of activities in ASTM's Committee D-30 on High-Modulus Fibers and their Composites and Subcommittee C28.07 on Ceramic Matrix Composites. This will be followed by an update from the American Society for Composites. Finally, two new composite material publications will be noted.

ASTM COMPOSITES ACTIVITIES

D-30's Spring Symposium Program and Committee Meetings Outlined; C28.07 Meeting Reviewed

D-30 to Hold 7th Symposium On Composite Materials: Fatigue And Fracture

Committee D-30 will hold the Seventh Symposium on Composite Materials: Fatigue and Fracture on 7 and 8 May 1977 in St. Louis, Missouri. Ronald B. Bucinell of Union College will chair the symposium. The symposium will feature 20 papers. A highlight of the symposium will be the presentation of the annual Wayne W. Stinchcomb Memorial Award and Lecture. A special technical publication (STP) based on the symposium proceedings is anticipated. A preliminary list of papers and authors is included below.

Life Prediction Tool for Ceramic Matrix Composites at Elevated Temperatures—Virginia Polytechnic Institute and State University

Failure Prediction of Impact Damaged Composite Structures by Optical and Acoustical Computer Sensing with Neural Network Techniques—M. D. Lansing, J. L. Walker, and S. S. Ressel

Strength Recovery of Impact Damaged Thermoplastic Composites—T. C. Chu, S. C. Yen, and H. D. Lin

Differences in the Impact Response Mechanisms of Graphite/Epoxy Composite Structures—J. E. Patterson

The Effects of Tensile Preloads on the Impact Response of Carbon/Epoxy Laminates—A. T. Nettles

Impact Response of Sandwich Composites with Foam Core—D. Liu and X. Dang

Impact of Composite Targets by Medium Energy Projectiles—M. H. Triplett, R. W. Helem

Onset of Fatigue Delamination Growth in Woven Fabric Composites under Mixed-Mode Loading—K. Shivakumar, and N. B. Adeyemi


Application of a Stochastic Model for Fatigue Induced Delamination Growth in Graphite/Epoxy Laminates—R. B. Bucinell


Influence of Temperature and Stress Ratio on the Low-Cycle Fatigue Behavior of Trimarc-1/Ti-6Al-2Sn-4Zr-2Mo—D. J. Buchanan, R. John, J. M. Larsen, and K. Goecke

Effect of Stress, Stress Ratio and Temperature on Fatigue Crack Growth Behavior of [0]n SCS-6/Ti-6Al-4V—R. John, J. R. Jira, and J. M. Larsen

Transverse Tension Fatigue Characterization of Composite Materials—A. W. Peck

The Effects of Stress and Temperature on the Open-Hole Tension Fatigue Behavior of a Graphite/Bismaleimide Composite—T. S. Gates, and W. Johnston

Composites Art, and Mural Paintings—J. K. Reilly and L. C. Fries

An Overview of Biaxial Test Results for Carbon Fiber Composites—S. R. Swanson

Compression Strength Reduction in Composite with In-Plane Fiber Waviness—P. J. Joyce and T. J. Moon

Comparison of Two Accelerated Hot-Wet Aging Conditions of Glass Reinforced Epoxy Resin—G. Zaffaroni, C. Cappelletti, M. Rigamonti, L. Fambri, and A. Pegoretti


D-30 Committee Meetings to be Held

In addition to the symposium outlined above, Committee D-30 will conduct a full schedule of subcommittee meetings in St. Louis. A roster of Subcommittees, their chairs, and task groups are listed below.

For further information on Committee activities, please contact the Committee's Staff Manager, Kathie Morgan at ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; Tel. (610) 832-9721.
Roster of Subcommittees and their Chairs

Subcommittee D30.01—Editorial
Chair: Crystal Newton
Material Science Corp.
Suite 250
500 Office Center Drive
Fort Washington, PA 19034
Tel. (215) 542-8400
- Task Group on Data Reporting

Subcommittee D30.02—Research and Mechanics
Chair: Roderick H. Martin
Materials Engineering Research Laboratory Ltd.
Tamworth Road
Hertford SG13 7DG, England
Tel. (0)992 500120
- Task Group on International Standards Harmonization
- Task Group on Long Term Durability
- Task Group on Textile Composites
- Task Group on Round Robin Testing
- Task Group on Impact

Subcommittee D30.03—Constituent Properties
Chair: James R. Ferrel
Hexcel, Corp.
M. S. 8185
P. O. Box 18748
Salt Lake City, UT 84118-0748
Tel. (801) 251-5253
- Task Group on NDE

Subcommittee D30.04—Lamina/Laminate Properties
Chair: Richard E. Fields
Lockheed Martin
P. O. Box 628007
Mail Point 1404
Orlando, Florida 32862-8007
Tel. (407) 356-5842
- D30.04.01 Tension Test Methods
- D30.04.02 Compression Test Methods
- D30.04.03 Shear Test Methods
- D30.04.04 Fatigue
- D30.04.05 Ring/Filament Wound Composites Test Methods
- D30.04.06 Guides
- D30.04.08 Specimen Preparation

Subcommittee D30.05—Structural Properties
Chair: Ronald F. Zabora
Boeing Commercial Airplanes
P. O. Box 3707
Mail Stop 48-02
Seattle, Washington 98124-2207
Tel. (206) 662-2655

Subcommittee D30.06—Interlaminar Properties
Chair: T. Kevin O’Brien
U. S. Army Aeronautical Directorate
NASA Langley Research Center
Mail Stop 188E
Hampton, Virginia 23665-5225
Tel. (804) 864-3465
- D30.06.01 Mode I Testing
- D30.06.02 Mode II Testing
- D30.06.03 Mixed Mode Testing
- D30.06.04 Fatigue
- D30.06.05 Interlaminar Shear Strength
- D30.06.06 Interlaminar Tension Strength

Subcommittee D30.07—Metal Matrix Composites
Chair: W. Steven Johnson
School of Materials Science and Engineering
Georgia Institute of Technology
Atlanta, GA 30332-0245
Tel. (404) 894-3013
- D30.07.01 Tension Testing
- D30.07.02 Fatigue Testing

C28.07 on Ceramic Matrix Composites—Activities Reviewed

The emphasis of Subcommittee C28.07, Ceramic Matrix Composites, is primarily continuous fibre ceramic composites (CFCCs). The Subcommittee held a working meeting on 20 June 1996 at ASTM headquarters in West Conshohocken, Pennsylvania as part of Committee C-28’s (Advanced Ceramics) regular meetings. Formal task group meetings of the subcommittee were held on 19 and 20 June. The following is a summary of those proceedings.

C28.07.01 Tension Task Group
Michael G. Jenkins, University of Washington

Negative ballots of the new standard “Standard Test Method for Monotonic Tensile Strength Testing of Continuous Fibre-Reinforced Advanced Ceramics with Solid Rectangular Cross Section Specimens at Elevated Temperatures” were found persuasive. The item was withdrawn from Spring ’96 ballot, will be revised by the primary author, M. Jenkins, and was resubmitted for ballot in Fall ’96. The draft standard appeared to be basically quite solid and the number of editorial errors has been dropping with successive ballots.

A new effort in this task group has been initiated to develop a test method for throughthickness tensile strength. L. Zawada has completed some experimental work in this area and will be drafting an addendum to C 1275, the current tensile testing standard for CFCCs.

Finally, there was some discussion regarding round-robin testing for the precision and bias statement of C 1275. Several laboratories were identified as possible participants in such a round robin (General Electric, Joint Research Center, NASA-Lewis, ORNL, Pratt and Whitney, Southern Research, University of Michigan, University of Dayton Research Institute, and University of Washington, Wright-Patterson AFB). Several materials systems including those of DuPont/SEP, DuPont/Lanxide, Dow Corning, UTRC, and BF Goodrich were also identified although the question of...
funding for purchase of material was not answered. M. Jenkins was charged with inviting labs to participate and soliciting material.

C28.07.02 Compression Task Group
Michael G. Jenkins, University of Washington

Negative ballots were found persuasive for the new standard "Standard Test Method for Monotonic Compressive Strength Testing of Continuous Fibre-Reinforced Advanced Ceramics with Solid Rectangular Cross Section Specimens at Ambient Temperatures." The item was withdrawn from Spring '96 ballot, will be revised by the primary author, M. Jenkins, and will be resubmitted for ballot in Fall '96. While the majority of the document was quite sound, there were sufficient editorial points raised by affirmative with comment ballots to persuade the subcommittee to withdraw the document for corrections.

C28.07.03 Creep/Creep Rupture Task Group
Edgar Lara-Curzio, Oak Ridge National Laboratory

"Standard Test Method for Creep and Creep Rupture Testing of Continuous Fibre Reinforced Advanced Ceramics," has become the third standard of the subcommittee. The new designation is C 1337-96. The primary author, E. Lara-Curzio, has been nominated for a certificate of appreciation from ASTM for his efforts.

C28.07.04 Flexural Properties Task Group
Steve Gonozy, AlliedSignal Corporation

Negative ballots cast on the Spring '96 ballot of "Standard Test Method for Flexural Properties of Continuous Fibre Ceramic Composites" were resolved at the meeting. This item becomes the fourth new standard after successful society of the subcommittee balloting and has been assigned the number C 1341 by ASTM.

C28.07.05 Shear Properties Task Group
Edgar Lara-Curzio, Oak Ridge National Laboratory

No target date has been set for the introduction of a high-temperature version of ASTM C 1292-95, "Standard Test Method for Shear Strength of Continuous Fibre Ceramic Matrix Composites at Ambient Temperatures." Similar issues were raised regarding round robin testing for C 1292 as were raised for the tensile testing standard. Fewer labs were identified as possible participants although the same materials systems were indicated.

C28.07.06 Tension-Tension Cyclic Task Group
Michael G. Jenkins, University of Washington

The new standard, "Standard Practice for Constant-Amplitude, Axial, Tension-Tension Cyclic Fatigue of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperatures," received two negative ballots and several affirmative with comments ballots in the Spring '96 balloting. The item was withdrawn from ballot, will be revised by the primary author, M. Jenkins, and will be resubmitted for balloting in Fall '96.

C28.07.07 Ceramic Fiber Task Group
John Porter, Rockwell International Science Center

The draft standard "Standard Test Method for Tensile Strength and Young's Modulus for High Modulus Single Filament Materials" is currently on hold. Task group leader, J. Porter, reported in absentia that the task group has reached at least two major conclusions: (1) a new document is required (rather than a revision of another committee's (D30) standard) and (2) a major stumbling block is the measurement and use of fiber diameters/cross-sectional dimensions. A new round-robin on high-temperature fiber testing is proceeding slowly.

C28.07.08 Interfacial Properties Task Group
Edgar Lara-Curzio, Oak Ridge National Laboratory

The task group chair, E. Lara-Curzio, is still working on the draft of an ASTM guide that he is developing from a review report authored by himself at ORNL.

C28.07.09 Thermal Properties Task Group

This new task group is still in need of a chair. S. Gonozy volunteered to participate in such a task group although he declined to chair it. Reasons for forming the new task group include the need for thermal properties in design (now that many of the required mechanical properties have been addressed) and the lack of standardized methods for measuring thermal properties of CFCCs.

ISO TC206 Activities
Michael G. Jenkins, University of Washington

The final piece of old business concerned ASTM's involvement in ISO's activity on advanced ceramics, TC-206 "Fine Ceramics." M. Jenkins requested and received a formal liaison between ASTM C28.07 and the CEN section. In addition, CEN did not discourage ASTM to proceed with the proposal of a new work item in ISO TC206 on tensile testing CFCCs. In April 1996, M. Jenkins submitted a proposal for a new work item on tensile testing CFCCs, "Tensile Behaviour of Continuous Fibre-reinforced Fine (Advanced, Technical) Ceramic Composites at Ambient Temperatures," which will be formally decided at the next TC-206 meeting in Cairns, Australia in July 1996.

Symposium

Final technical and editorial reviews are being completed on papers presented at the C28/E08/American Ceramic Society jointly-sponsored "Symposium on Thermal and Mechanical Test Methods and Behaviour of Continuous Fibre Ceramic Composites (CFCCs)" which was held over the two-day period of 08-09 January. Twenty-four papers will be included in STP 1309, "Thermal and Mechanical Test Methods and Behaviour of Continuous Fibre Ceramic Composites (CFCCs)" co-edited by M. Jenkins, E. Lara-Curzio, and S. Gonozy from C-28 and N. Ashbaugh and L. Zawada from E-8.

The next subcommittee meeting is scheduled for 10-12 June 1997 in Cocoa Beach, Florida.
Call for Papers

Co-sponsored by Wayne State University, the Automotive Composites Consortium (ACC), and the Michigan Materials and Processing Institute (MMPI)
1997 October, 6-8
The Dearborn Inn
Dearborn, Michigan

The purpose of this conference is to provide an interdisciplinary forum for technical presentations and discussions addressing both fundamental and applied research issues and their solutions that advance the science and technology of advanced composites for structural and other applications. Several generic areas are identified for authors interested in participating in the conference and in contributing technical papers.

Unpublished papers are sought in automotive, aerospace, industrial, infrastructure, and other applications for all types of composites in the following focused areas and other related areas:

• Manufacturing and Processing of Composites
• Constitutive Behavior and Modeling of Reinforced Composites
• Deformation and Failure of Composite/Failure Theories
• Dynamic and Viscoelastic Response
• Analysis and Design of Joints
• Impact Response and Damage Tolerance

Prospective authors are encouraged to submit a 300 to 500 word abstract addressed to the conference secretary, Ms. Audra Duffer, Mechanical Engineering Department, Wayne State University, Detroit, MI 48202 by January 31, 1997. Authors will be notified of acceptance by March 31, 1997. A ten-page paper will be due from authors by June 15, 1997 for inclusion in the conference proceedings.

It is anticipated that there will be two panel sessions with focus on Composites Education and Industry Needs and Research Opportunities at the conference. The conference will be co-chaired by Professor Ronald Gibson (tel: 313-577-3702, fax: 313-577-8789, e-mail: gibson@eng.wayne.edu) and Professor Golam Newaz (tel: 313-577-3877, fax: 313-577-8789, e-mail: gnewaz@eng.wayne.edu) of the Mechanical Engineering Department and the Advanced Composites Research Laboratory, WSU.

As part of the conference, tours of the composites laboratories at Ford Motor Company and Wayne State University are planned, along with a visit to the Henry Ford Museum and Greenfield Village.

RECENT COMPOSITES PUBLICATIONS

Two New Composites Publications Noted

Composite Materials: Testing and Design (12th Volume)


Composite Materials: Testing and Design (12th Volume; STP 1274) features the most current test and analysis methods applied to composite materials and structures, as well as this decade's latest technological developments in composites.

Twenty-one papers from the world's leading experts in the field focus on the following four categories:

• Environmental Effects Testing—Five papers address the long-term behavior of composites in higher temperature structures.
• Design Allowables and Damage Tolerance Testing—Innovative techniques for damage tolerance testing are the focus of five papers, featuring two new experimental methods.
• Textile and other Advanced Composites—Five papers examine two widely disparate systems: textile composites and metal matrix composites.
• Design, Analysis and Test Techniques—Test data interpretation using a variety of mechanical test methods are explored in six papers. A broad range of current applications for composite materials as well as potential future use are explored.

This publication is an invaluable resource for materials scientists, structural design engineers, building contractors, and researchers involved in the design and analysis of structures that utilise composite materials systems.

Contents

Environmental Effects Testing
Effects of Physical Aging at Elevated Temperatures on the Viscoelastic Creep of IM7/K3B—T. S. Gates and M. Feldman

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Fiber, Matrix, and Interface Properties


Fiber, Matrix, and Interface Properties (STP 1290) features the latest information on the role of fibers, matrices and their interface/interphase in composite performance.

The country's leading researchers in the field have presented 13 comprehensive, peer-reviewed papers covering innovative approaches to interfacial test methods in composite materials development. Topics explored include:

- Dynamic mechanical evaluation techniques for interfacial properties in high-volume fraction composites
- Fatigue life and damage accumulation of short-fiber reinforced polymer composites
- Alternate approaches for high-performance composite testing
- Fiber matrix adhesion evaluation
- Voltage contrast XPS assessment
- Debonding in fiber pull-out specimens
- An innovative technique for studying interfacial strength and transverse cracking

STP 1290 is an important publication for materials scientists, engineers and researchers involved in composite interfaces between fibers and resins, and professionals concerned with surface treatments evaluation and methods for optimizing composite materials adhesion.

Contents

Nonlinear Elastic Characterization of Carbon Fibers—P. Arsenovic

Methods of Determining the Temperature Dependency of Primary Creep—C. A. Lewinsohn, C. E. Bakis, and R. E. Tressler

Interfacial Measurements and Fracture Characteristics of Single and Multi-Fiber Composites by Remote Laser Raman Microscopy—C. Galiotis, V. Chohan, A. Paitetis, C. Vlattas

The Use of Interfacial Test Methods in Composite Materials Development—M. J. Pitkeithly

Analysis of Stress Transfer from the Matrix to the Fiber Through an Imperfect Interface: Application to Raman Data and the Single-Fiber Fragmentation Test—J. A. Nairn, Y. C. Liu, and C. Galiotis

Modeling the Dynamic Response of the Fiber/Matrix Interphase in Continuous Fiber Composite Materials—J. J. Yuan, J. M. Kennedy, and D. E. Edie

Direct Observation of Debonding in Fiber Pull-Out Specimens—M. R. Piggott and Yu Xiong

Interlaboratory Study of Adhesion Using Voltage Contrast XPS—J. D. Miller, G. W. Zajac, and T. Nguyen


A New Technique to Study the Interfacial Strength and Transverse Cracking Scenario in Composite Materials—C. Wood and W. Bradley
Characteristics of Fatigue Life and Damage Accumulation of Short-Fiber Reinforced Polymer Composites—A. T. Yokobori, Jr., H. Takeda, T. Adachi, J. C. Ha, and T. Yokobori
Fiber/Matrix Interface Studies Using Fragmentation Test—J. P. Armistead and A. W. Snow

Fiber/Matrix Interface Effect on Monotonic and Fatigue Behavior of Unidirectional Carbon/Epoxy Composites—B. Large-Toumi, M. Salvia, and L. Vincent
Calendar on Composites

The following meetings may be of interest to researchers in the field of composite materials.

2--4 January 1997
Fifth Pan American Congress of Applied Mechanics (PACAM V)
San Juan, Puerto Rico
Contact: Prof. Luis E. Suarez or Prof. Marek Rysz, Department of General Engineering, University of Puerto Rico, Mayaguez, P. R. 00681-5000, USA; ph: (809) 831-5224; fax: (809) 265-3816

9-13 March 1997
IUTAM Symposium on Transformation Problems in Composite and Active Materials Cairo, Egypt
Contact: Prof. G. J. Dvorak, Department of Civil Engineering, Rensselaer Polytechnic Institute, Troy, NY 12180-3590, ph: +1 518-276-6940; fax: +1 518-276-8784; e-mail: dvorak@rpi.edu

17-20 March 1997
Fifth International Conference on Computational Plasticity (Complas)
Barcelona
Contact: Prof. D. R. J. Owen, Department of Civil Engineering, University College of Swansea, Singleton Park, SWANSEA SA2 8PP, U.K; ph: 44 1792/20 56 78; fax: 44-1792/29 56 76

7-10 April 1997
12th Annual ESD Advanced Composites Conference and Exposition, Westin Hotel Renaissance Center
Detroit, Michigan
Contact: Wael Berrached, ESD-The Engineering Society, 29355 Northwestern Hwy., Ste. 200, Southfield, MI 48034

5-6 May 1997
Symposium on Effects of Product Quality on Structural Durability
St. Louis, Missouri
Contact: Richard C. Rice, Engineering Mechanics Department, Battelle, 505 King Avenue, Columbus, Ohio 43201-2693; ph: (614) 424-4433; fax: (614) 424-3457; e-mail: ricerich@battelle.org

3-5 June 1997
International Conference on Fatigue of Composites, Eighth International Spring Meeting Paris, France
Contact: Chantal Iannarelli, Congrés Scientifiques Services (C2S), 2, rue des Villarmains, BP 124.92210 Saint Cloud, Cedex (France); ph: 33 (1) 47.71.90.04; fax: 33 (1) 47.71.90.05

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24-26 June 1997
29th National Symposium on Fatigue and Fracture Mechanics
Stanford, California
Contact: Tina L. Panontin, NASA Ames Research Center, MS 213-4, Moffett Field, CA 94035; ph: (415) 604-6757; e-mail: tina.panontin@qgate.arc.nasa.gov
Sheri D. Sheppard, Mechanical Engineering Dept. Stanford University, Stanford, CA 93045; ph: (415) 725-1590; e-mail: sheppard@cdr.stanford.edu

29 June–2 July 1997
The 1997 Joint ASME AMDIASCE EMD Summer Meeting (McNU '97)
Northwestern University
Contact: Wing Kam Liu, Northwestern University, Department of Mechanical Engineering, 2145 Sheridan Road, Evanston, Illinois 60208-3111; ph: (708) 491-7094; fax: (708) 491-3915; e-mail: McNU97@nwu.edu

6–11 July 1997
Fourth International Conference on Composites Engineering (ICCE-4)
Hawaii
Contact: Dr. David Hui, University of New Orleans, Department of Mechanical Engineering, New Orleans, LA 70148; ph: 504-280-6652; fax: 504-280-5539; e-mail: dxhme@uno.edu

14-18 July 1997
Eleventh International Conference on Composite Materials (ICCM-11)
Gold Coast, Australia
Contact: ICCM-11 Conference Office, RMIT Fishermens Bend GPO Box 2476V, Melbourne, Victoria, 3001, Australia; ph: +61 3 9647 3064; fax: +61 3 9647 3099; e-mail: acss@aero.rmit.edu.au; http://www.acss.acro.rmit.edu.au/ICCM-11

14–17 September 1997
The Third International Conference on Progress in Durability Analysis of Composite Systems (DURACOSYS 97)
Virginia Polytechnic Institute and State University
Contact: Ken Reifsnider, General Co-Chairman, Department of Engineering Science and Mechanics, 120 Patton Hall, Virginia Tech, Blacksburg, Virginia, 24061-0219 USA; ph: (540) 231-5316, fax: (540) 231-9187; e-mail: mrl@vtvl.ml.cc.vt.edu
22–24 September 1997
First International Conference on Damage and Failure of Interfaces (DFI-1)
Vienna, Austria
Contact: Doz. Dr. H. P. Rossmanith, Institute of Mechanics, University of Technology Vienna, Wiedner Hauptstraße 8-10/325, A-1040 Vienna, Austria; ph: 0043-1-58801-5514; fax: 0043-1-5875863; e-mail: rossmanith@emch80.una.ac.at

6–8 October 1997
American Society for Composites, 12th Technical Conference on Composite Materials
The Dearborn Inn, Marriot Hotel, Dearborn, MI
Contact: Ronald F. Gibson, Wayne State University, College of Engineering, 5050 Anthony Wayne Dr. Detroit, MI 48202; ph: (313) 577-3861; fax: (313) 577-5300; e-mail: ronald.gibson@eng.wayne.edu

Fall 1998
American Society for Composites, 13th Technical Conference on Composite Materials
Contact: A. Vizzini, University of Maryland, Dept. of Aerospace Engineering, College Park, MD 20742; ph: (301) 405-1123; fax: (301) 314-9775; e-mail: vizzini@eng.umd.edu

Send items for this calendar to:
Prof. M. W. Hyer
Department of Engineering Science and Mechanics Virginia Polytechnic Institute and State University Blacksburg, VA 24061-0219
Telephone (703) 231-5372
Fax: (703) 231-4574
e-mail: hyerm@vt.edu
The Journal of Composites Technology & Research (JCTR) is a quarterly publication sponsored by ASTM technical committee D-30 on High Modulus Fibers and Their Composites, and E-8 on Fatigue and Fracture. Each published paper and technical note has been peer-reviewed. Papers and technical notes are open to brief written comments in the Discussion section of the Journal, which also includes authors' written responses.

The Technical Editor may consider a paper submitted to the Journal as a Technical Note if: it gives a reasonably brief description of ongoing studies with or without providing interim, tentative data, and/or conclusions; it reports phenomena observed in the course of research requiring further study; it provides mathematical procedures for facilitating reduction and analysis of data; or it reports promising new materials prior to undertaking extensive research to determine their properties.

The decision as to whether a manuscript is published as a paper or a technical note resides with the Technical Editor.

The guidelines below describe our manuscript selection, peer review, revision, and publication processes. Following these guidelines will ensure expeditious handling of submitted material.

**Submission**

The name, mailing address, position, affiliation, and telephone and fax number of each author must be supplied in a cover letter. The submitting author is to provide the names, affiliations, addresses, and telephone numbers of five to six individuals who are qualified to review impartially the paper and the research leading to it, and who are not employed at the same institution or company as any of the authors. While these names may or may not be used for the review, we will add them to our pool of potential reviewers. Also, a statement is to be included that the paper has not not been published and is not under consideration for publication elsewhere. All permissions for previously published material used in the paper must be submitted in writing at this time.

The submitting author must also affirm that all those listed as co-authors have agreed (a) to be listed and (b) to submit the manuscript to ASTM for publication.

Five copies of the manuscript with clear copies of each figure are required. Original art work and computer disks should accompany the final revision.

**Manuscript Instructions**

*Word Processing Instructions*

The hard-copy text can be produced on any letter-quality printer. Text is to be printed double-spaced with left and right margins of 1 in. (25.4 mm) using left justification. New paragraphs are to be indented five spaces, and end-of-line returns are not to be used.

The revised manuscript is to be sent on a 5 1/4 in. (133 mm) or 3 1/2 in. (89 mm) disk preferably in WordPerfect 5.1, with the corresponding hard copies. ASTM can convert from other word-processing packages as well.

*For complete manuscript instructions, which include a sample manuscript, call Barbara Stafford, Administrative Assistant, ASTM Journals, 810/832-9621 or FAX 810/832-9635.

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**Abstract and Keywords**

An abstract of 100–150 words and a list of 5–10 keywords that can be used to index the manuscript are required.

**Trademarks**

Commercialism is to be avoided by using generic terms whenever possible. Trademarks and trade names are to be capitalized if their use is unavoidable.

**SI Units**

Society policy requires the use of SI units in all publications (including figures and tables). If in.-lb. units must be used to describe materials and present test results, SI equivalents must follow in parentheses. (See ASTM Standard for Metric Practice E380 for further information on SI units.)

**Figures**

Each figure is to be simple and uncluttered. All illustrations are to be placed together at the end of the manuscript with a separate sheet of figure captions. Consecutive Arabic (not Roman) numerals are required. The size of type in illustrations must be large enough to be legible after reduction. All lettering, lines, symbols, and other marks must be drawn in black India ink on white paper. Computer graphics must be produced by a laser printer. Photographs must be high-contrast black and white. SCALE MARKERS MUST BE SHOWN ON ALL PHOTOMICROGRAPHS AND ALL FIGURES THAT ARE REPRESENTATIONS OF EQUIPMENT OR SPECIMENS.

**Tables**

All tables are to be placed together at the end of the manuscript preceding the illustrations. Tables are to be numbered in Arabic and are cited in numerical order in the text. It is better to use several small simple tables than one large, complex table.

**References**

References shall be cited in the text in numeric order. Type the numerical citation on the line, not as a superscript, and enclose in brackets. References should be listed together at the end of the paper in numeric order. They must contain enough information to allow a reader to consult the cited material with reasonable effort.

**Copyright**

ASTM Requires that the submitting author shall return our "Author Agreement" with the revised paper assigning copyright to ASTM. For U.S. government employees whose manuscript has been prepared as part of their official duties, it is understood that copyright in the United States is not transferrable.

**Manuscript Review**

Each new manuscript is sent to the Technical Editor for consideration. If the Technical Editor finds that the manuscript fits the
scope of the journal, will be of interest to the readership, and is well written, the paper is processed for peer review.

Two or more reviewers, selected by a member of the Editorial Board, review each paper for technical content, originality, logical conclusions, sound data, reproducibility of results, and clarity of presentation; two or more reviewers provide reviews of each technical note. Their comments are compiled and evaluated. The reviewers' anonymous comments and any other comments from the Technical Editor or his designee are then returned to the author for revision.

The author must submit five copies of the revised manuscript with an annotated (highlighted) version of the paper indicating clearly where each revision has been made and identifying the reviewer's comment to which the revision is responding. Changes in the text including all MANDATORY reviewers' comments must be addressed explicitly on the "Authors' Response Form" provided during revision, as well as any explanation why a change was not made.

The Technical Editor will evaluate all revised manuscripts and make the final decision regarding publication in the Journal. The Editor may (1) accept the revised manuscript for publication, (2) require further revision or explanation, or (3) reject the revised manuscript. A revised manuscript may be sent for re-evaluation to a reviewer who has found major flaws in the original manuscript.

Editorial Review by ASTM

Each accepted paper is edited by the ASTM staff for style, organization, and proper English usage. The edited manuscript is returned to the author before typesetting. The typeset page proof is also sent to the author and the Technical Editor for final review prior to printing.

If ASTM does not hear from the author by the time designated for return of the edited paper and/or page proof, ASTM will proceed with the publication process.

Book Reviews

ASTM receives books from other publishers requesting book reviews. The books are available to potential reviewers in exchange for publishable reviews. Book reviews are screened and edited by the Technical Editor and staff without peer review. Anyone interested in acting as a reviewer should contact Barbara Stafford at ASTM. Phone: (610) 832-9621.

Testing Forum and Tips

Anyone having interesting test tips should submit a brief description of such innovations to the Testing Forum. Such contributions are screened and edited by the Technical Editor and staff without peer review.
## 1997 INDIVIDUAL MEMBERSHIP

**APPLICATION IS MADE FOR MEMBERSHIP IN ASTM:**

<table>
<thead>
<tr>
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<td>AFFILIATION</td>
<td>FACILITY</td>
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<td>FAX ( )</td>
<td>E-MAIL</td>
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**NOTE:** If your affiliation is a subsidiary, please identify the parent organization.

**COMMITTEE APPLICATION REQUEST**

This application is for society membership only. A technical committee requires a separate application. Please send applications for the following committee(s):

- [ ]

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