World of Composites

News articles and announcements of interest to the composites technical community

Testing and Design of Composite Materials is Theme of ASTM Spring Symposium

ASTM Committee D-30 on High Modulus Fibers and Their Composites will sponsor Composite Materials Testing and Design: Eighth Symposium. The symposium will be held 29 April to 1 May 1986 at the Sheraton Charleston Hotel, Charleston, SC.

Thirty-three papers will be presented in session on Analysis, Impact and Compression, Materials Characterization, Failure Mechanisms, Nondestructive Evaluation, and Filament Wound and Woven Composites.

The symposium will be held in conjunction with the 28 April 1986 standards development meetings of Committee D-30 at the Sheraton Charleston Hotel. All symposium attendees are welcome to participate in these meetings. There is no fee to attend either the symposium or the meetings, and membership in ASTM is not required.

A Special Technical Publication (STP) based on the symposium is anticipated by ASTM.

Preregistration deadline for this symposium is 10 March 1986. To receive a complete program booklet, including preregistration and hotel information cards, contact ASTM Staff Manager Matthew E. Lieff, ASTM Standards Development Division, 1916 Race Street, Philadelphia, PA 19103, 215/299-5516.

For additional technical information, contact the Symposium Chairman John D. Whitcomb, Materials Division, NASA Langley Research Center, M.S. 188E, Hampton, VA 23665, 804/865-3046.

International Symposium on Fatigue Crack Closure Set for May 1986

ASTM Committees E-24 on Fracture Testing and E-9 on Fatigue will sponsor the International Symposium on Fatigue Crack Closure on 1-2 May 1986 at the Sheraton Charleston Hotel, Charleston, SC.

Since the discovery of the fatigue crack-closure mechanism, some 15 years ago, many advances have been made in conducting fatigue crack growth rate tests and in predicting crack growth life under expected service operating conditions. This symposium will provide a forum for exchanging information and experiences on crack-closure measurement techniques during fatigue crack growth rate tests, on crack-closure analysis methods, and on practical applications of the crack-closure concept.

Forty-four papers will be presented, along with a panel discussion. Keynote speakers are Dr. P. C. Paris of Washington University, St. Louis, MO, and Professor J. Schijve of Delft University of Technology, Delft, The Netherlands.

The symposium will be held in conjunction with the 28 April to 1 May 1986 standards development meetings of Committees E-24 and E-9 at the Sheraton Charleston Hotel. All symposium attendees are welcome to participate in these meetings. There is a $25.00 activities fee to attend the symposium, which will be used to cover travel expenses for the keynote speakers.

A Special Technical Publication (STP) based on the symposium is anticipated by ASTM.

To receive a complete program booklet, contact ASTM Staff Manager Matthew E. Lieff, ASTM Standards Development Division, 1916 Race Street, Philadelphia, PA 19103, 215/299-5516.

For additional technical information, contact the Symposium Chairmen: James C. Newman, Jr. or Wolf Elber, NASA-Langley Research Center, Mail Stop 188E, Hampton, VA 23665, 804/865-3192 or Ext. 3012.

ASTM Symposium on Dynamic Behavior

The symposium, Dynamic Behavior of Composite Materials, Components, and Structures, will be held at the 1986 Spring Meeting of the Society for Experimental Mechanics (SEM) on 8–12 June 1986 at New Orleans, LA. The symposium is being co-sponsored by the SEM Composite Materials Committee and the SEM Modal Analyses/Dynamic Systems Committee.

Twelve invited papers are to be presented on topics such as an overview of recent research, dynamic behavior of composites in machinery, modal analysis of composite structures, damping characteristics of new polymer matrix and metal matrix composites, aeroelastic behavior of composite aircraft wings, delamination of composite laminates under impact, damage characterization with dynamic measurements, and rate sensitivity of energy absorbing composites.

For information on the symposium contact R. F. Gibson, Mechanical Engineering Department, University of Idaho, Moscow, ID 83843, 208/885-7432.

The program for the symposium is as follows:

Session I

Chairman: R. F. Gibson, Mechanical Engineering Dept.
University of Idaho, Moscow, ID 83843
(208) 885-7432

Cochairman: S. K. Chaturvedi, Civil Engineering Dept.
Ohio State University, Columbus, OH 43210
(614) 422-2771
1. Dynamic Behavior of Composites: An Overview
C. W. Bert
AMNE Research Center
University of Oklahoma—North Campus
1928 Goddard
Norman, OK 73069
(405) 325-5011

2. The Dynamic Behavior of Composites in Machinery: An Overview
B. S. Thompson and M. V. Gandhi
Department of Mechanical Engineering
Michigan State University
East Lansing, MI 48824-1226
(517) 355-5131

3. Modal Frequencies and Damping of Stiffened Composite Honeycomb Panels
J. Soovere
Lockheed-California Company
D76-12, B63G, Plant A1
P.O. Box 551
Burbank, CA 91520
(818) 847-2225

4. Measured Effects of Lay-up and Frequency of Vibration on Cycles-to-Failure of Composites at Resonance
R. A. Ely
Vought Aero Products Division
LTV Aerospace and Defense Company
Box 225907, Mail Stop 194-51
Dallas, TX 75265-5907
(214) 266-3959

5. Damping Characteristics of Graphite-Aluminum Composites
M. S. Misra and S. Rawal
Martin Marietta Aerospace
Denver Aerospace
P.O. Box 179
Denver, CO 80201
(303) 977-3000

6. Damping Behavior of Graphite-Magnesium Composites
G. L. Steekel
Aerospace Corporation
2350 East El Segundo Blvd.
El Segundo, CA 90245
(213) 648-7116

Session II

CHAIRMAN: S. W. Welles, Boeing Airplane Co.
3407 38th Avenue S.W.
Seattle, WA 98126
(206) 655-6068 or 937-7242

COCHAIRMAN: C. A. Ross, University of Florida
P.O. Box 1918
Eglin AFB, FL 32542
(904) 882-5674

7. Aeroelastic Characteristics of a Composite Forward Swept Wing
K. Wilkinson
Grumman Aerospace, MS B1635
Bethpage, NY 11714
(516) 575-5175

8. Damping of High Strength Materials
R. L. Sierakowski and W. E. Wolfe
Civil Engineering Department
Ohio State University
Columbus, OH 43210
(614) 422-2771

9. Damping in Aluminum-Filled Epoxy Using Two Different Flexural Testing Techniques
K. G. McConnell and J. D. Rogers
Department of Engineering Science and Mechanics
Iowa State University
Ames, IA 50011
(515) 294-2884

10. Delamination in Central Impact in Graphite-Epoxy Laminates
L. E. Malvern and D. Liu
Department of Engineering Sciences
University of Florida
Gainesville, FL 32611
(904) 392-0961

11. Stress Wave Techniques for Monitoring Damage Development in Composite Laminates
E. G. Henneke and J. C. Duke
Department of Engineering Science and Mechanics
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061
(703) 961-5316

G. L. Farley
Aerostructures Directorate
U.S. Army Aviation Research & Technology Activity
AVSCOM
NASA Langley Research Center
Mail Stop 188B
Hampton, VA 23665-5225
(804) 865-2850

and
S. J. Lubowinski
PRC Kentron, Inc.
3221 N. Armistead Ave.
Hampton, VA 23665-5225
(804) 865-4132
Call for Papers

Symposium on Composite Materials: Fatigue and Fracture

A call for papers is issued for the ASTM Symposium on Composite Materials: Fatigue and Fracture to be held the week of 26 April 1987 at the OMNI Netherland Plaza, Cincinnati, OH. The symposium is sponsored by ASTM Committee D-30 on High Modulus Fibers and Their Composites and coincides with an ASTM Committee Week.

This is the 9th symposium specifically dealing with fatigue and fracture of composites sponsored by ASTM. The last was held in Oct. 1984. The symposium is held to provide an opportunity for the presentation and discussion of recent developments in the areas of fatigue and fracture of composite materials. The symposium chairman is Professor Paul A. Lagace of the Massachusetts Institute of Technology.

Previously unpublished papers are sought describing experimental and analytical research in the areas relating to the fatigue and fracture of composite materials. Papers dealing with newly recognized phenomena as well as novel approaches to long-standing problems are encouraged. Particular topics of interest include:

- failure mechanisms and their interaction (including delamination)
- progressive fracture
- fractography
- effects of flaws and notches
- compressive failure
- control of failure/fracture
- material comparison (including filament-wound and braided)
- longevity characteristics
- damage accumulation
- residual properties
- effects of impact
- time-dependent behavior
- environmental effects (including space)
- statistical/reliability aspects
- "tough" matrix systems

Prospective authors are requested to submit a proposed title and three copies of a 300 to 500 word abstract that may include one or two key figures with an ASTM Paper Submittal Form by 1 June 1986 to Kathy Greene, ASTM, 1916 Race St., Philadelphia, PA 19103, 215/299-5414. Paper submittal forms are available from Kathy Greene.

Authors will be notified of acceptance of their papers for the program on or about 1 Aug. 1986. Final manuscripts are due 1 Feb. 1987. A Special Technical Publication (STP) based on the symposium is anticipated by ASTM. Composite Materials: Fatigue and Fracture: 8th Symposium, STP 907 is based on the 1984 symposium of the same title.

Additional information is available from symposium chairman, Professor Paul A. Lagace, Massachusetts Institute of Technology, Room 33-313, Cambridge, MA 02139, 617/253-3628. ASTM may print and distribute accepted abstracts of the symposium with the approval of the symposium chairman.

New Task Groups and Workshops Are Part of ASTM D-30

At the Nov. 1985 meeting of ASTM Committee D-30 on High Modulus Fibers and Their Composites a number of special task groups were formed and several workshops were planned to focus attention on particular issues of importance in the composite materials community. Two symposia were also held: Fractography of Modern Engineering Materials (cosponsored with Committee E-24 on Fracture) and Testing Technology of Metal Matrix Composites.

Papers presented in the latter symposia pointed to an immediate need for standard test methods for these materials. In response to this need, five metal matrix composite material task groups were formed to develop standard test methods. The following are the new groups and their chairman: Tension Testing—Peter R. Di-Giovanni, Raytheon Co. (617/633-7442); Compression Testing—Golam Newaz, Battelle Columbus Labs. (614/424-4670); Shear Testing—John Kennedy, Clemson University (803-656-5632); Fracture Toughness Testing—Golam Newaz, Battelle Columbus Labs. (614/424-4670); and Fatigue Testing of Metal Matrix Composites—W. S. Johnson, NASA Langley Research Center (804/865-2715).

The Metal Matrix Composite Materials task groups will meet on 28 April during the Spring meeting of D-30, 28 April through 2 May in Charleston, SC. The D-30 technical subcommittees on Research and Mechanics, Automotive/Industrial Composites, and High Performance Fibers and Composites, and the task group on Interlaminar Fracture Toughness will also meet during the week.

Composite materials workshops are also planned for 28 April during the Charleston meeting. The topics to be covered are compression testing of laminated composites, shear test methods, specimen preparation techniques, and fractography methods (Fig. 1). Workshop information may be obtained from the workshop coordinators: compression—N. R. Adsit, Rohr Industries (619/691-6453); shear—Dale Wilson, University of Delaware (302/451-8960); specimen preparation—Paul Lockwood, Owens Corning (614/587-0610); and fractography—John Masters, American Cyanamid Co. (203/348-7331).

![FIG. 1—Compression test fixture for composite material specimens.](image-url)
A feature of the Spring meeting will be the Eighth Symposium on Composite Materials: Testing and Design. Information on the symposium can be obtained from symposium chairman John Whitcomb, MS188E, NASA Langley Research Center, Hampton, VA 23665 (804/865-3046) or Kathy Greene, ASTM (215/299-5414).

For more information on the activities of D-30, contact committee chairman, Wayne E. Stinchcomb, Department of Civil Engineering, University of Arizona, Tucson, AZ 85721 (602/621-2091) or Matthew Lieff, ASTM (215/299-5516).

Kenneth L. Reifsnider, VPI Professor, Elected to ASTM Board of Directors

Kenneth L. Reifsnider, Reynolds Metals Professor of Engineering Science and Mechanics at Virginia Polytechnic Institute and State University (VPI) in Blacksburg, Virginia, has been elected to a three-year term on the ASTM Board of Directors, effective 1 Jan. 1986 (Fig. 2).

Reifsnider, of Woodland Hills Drive in Blacksburg, has been an active ASTM member since 1974. He became a Fellow of the Society and received the Award of Merit in 1982. Reifsnider's primary contributions have been through ASTM Committee E-9 on Fatigue. He also serves on ASTM's Committee on Publications and is coeditor of Journal of Composites Technology & Research.

A native of Baltimore, MD, Reifsnider received a B.A. degree in mathematics from Western Maryland College, 1963, B.E.S. and M.S.E. degrees in mechanics from Johns Hopkins University, 1963 and 1965, respectively, and a Ph.D. degree in mechanics and metallurgy from Johns Hopkins University, 1968.

Reifsnider came to VPI in 1968, and has served as assistant professor, associate professor, and professor. He obtained his current title in 1984. During his stay at VPI, he has developed seven new courses, directed 18 graduate student programs, directed research under some 26 projects funded by 19 different agencies, published over 75 papers in journals, written several book chapters, and edited four books.

In addition, Reifsnider is a member of the American Society for Metals, the American Institute of Mining, Metallurgical and Petroleum Engineers, the Society for Experimental Stress Analysis, the American Society for Composite Materials, and the American Society for Mechanical Engineers.

All-Composite Aircraft from Finland

Starhawk, a new all-composite airplane, has recently been introduced in the United States by Condor Enterprises, Inc. The Starhawk is a design refinement of the PIK-23, designed by engineers at the University of Helsinki and built by Valmet, Inc., of Finland. It is an R&D aircraft, not yet certified.

The only metal components on the Starhawk are the engine, nose gear, instruments, and tail hook. The remainder of the low-wing (monoque) monoplane is molded composite fiber construction with additions of kevlar and carbon reinforcement added in critical areas. There are no ribs or bulkheads in the monoque design. Valmet claims that a three-man crew can build the aircraft in four days with painting and roll-out on day five. Cruise speed of the dual-stick, two-seat plane fitted with a 180-hp Lycoming A4M engine is about 130 knots. The empty Starhawk weighs 1298 lb (589 kg) and carries 309 lb (140 kg) of fuel. If not towing, it will carry a useful load of 659 lb (299 kg). The airplane is fully aerobatic.

The Starhawk has some very unusual flight characteristics including an 88° dive capability and a "mush up" stall behavior that is very stable. It is also quite difficult to locate with radar. The aircraft has been flown to a number of airfields in the United States and has been demonstrated for a variety of groups. Valmet and Condor will produce the Starhawk in the United States with all rights residing in the production company. Further information can be obtained from M. Stampolis, Condor Enterprise, Inc., Aurora Municipal Airport, Air Aurora Building, Box 433R, Route 1, Sugar Grove, IL 60554, U.S.A.
Calendar on Composites

17-18 April 1986
XII-th Southeastern Conference on Theoretical and Applied Mechanics
Columbia, SC
Contact: Sectam III, Office of Continuing Engineering Education, College of Engineering, University of South Carolina, Columbia, SC 29208

27-31 April 1986
Composite Materials Testing and Design: 8th Symposium
Charleston, SC
Contact: John D. Whitcomb, MS 188E, NASA Langley Research Center, Hampton, VA 23665; Telephone: 804-865-3012

19-21 May 1986
27th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics and Materials Conference
San Antonio, TX
Contact: AIAA, 1633 Broadway, New York, NY 10019

25-29 May 1986
International Conference on Computational Mechanics
Tokyo, Japan
Contact: Prof. G. Yagawa, Department of Nuclear Engineering, University of Tokyo 7-3-1, Hongo, Bunkyo-ku, Tokyo 133, Japan

27-30 May 1986
International Conference on Composite Interfaces
Cleveland, OH
Contact: H. Ishida, Macromolecular Science, Case-Western Reserve University, Cleveland, OH 44106

8-12 June 1986
SESA Spring Conference on Experimental Mechanics and Exhibit
New Orleans, LA
Contact: SESA, 14 Fairfield Dr., Brookfield Center, CT 06805; Telephone: 203-775-6373

10-13 June 1986
International Symposium on Composite Materials and Structures
Beijing, China
Contact: C. T. Sun, School of Aeronautics and Astronautics, Purdue University, West Lafayette, IN 47906; Telephone: 317-494-5130

16-20 June 1986
Austin, TX
10th U.S. National Congress of Applied Mechanics
Austin, TX
Contact: Prof. E. B. Becker, Dept. of Aerospace and Mechanical Engineering, The University of Texas, Austin, TX 78712

23-25 June 1986
The Third Japan-U.S. Conference On Composite Materials
Tokyo, Japan
Contact: J. R. Vinson and M. Taya, University of Delaware (302-451-2246) or Prof. K. Kawata and A. Kobayashi, Institute of Interdisciplinary Research, University of Tokyo, 4-6-1, Komaba, Meguro-ku Tokyo 153, Japan

30 June–2 July 1986
National Symposium on Fracture Mechanics
San Antonio, TX
Contact: Dr. T. A. Cruse, Southwest Research Institute, P.O. Drawer 28410, San Antonio, TX 78284

21–25 July, 1986
SIAM Meeting
Boston, MA
Contact: SIAM Meeting Dept., 117 S. 17th St., Philadelphia, PA 19103
Telephone: 215-564-2929

25–27 Aug. 1986
23rd Annual Technical Meeting of the Society of Engineering Science
Buffalo, NY
Contact: Prof. D. H. Inman, Dept. of Mechanical and Aerospace Engineering, Sun at Buffalo, 1013 Furnal Hall, Buffalo, NY 14260
Telephone: 717-636-2733

2–5 Sept. 1986
3rd International Conference on Computational Methods and Experimental Measurements
Porto Caras, Greece
Contact: Dr. G. A. Keramidas, Naval Research Laboratory, Code 5841, Washington, DC 20375; Telephone: 202-767-3389

10-11 Sept. 1986
Joining and Repair of Fibre-Reinforced Plastics
London, United Kingdom
Contact: Mr. F. L. Matthews, Aeronautics Dept., Imperial College, Prince Consort Rd., London S27 2BY, United Kingdom; Telephone: 91 589-5111 X 4003

16–19 Sept. 1986
EUROMECH 214: The Mechanical Behavior of Composites and Laminates
Dubrovnik, Yugoslavia
Contact: Prof. M. Micunovic, Faculty of Mechanical Engineering, University "Svetozar Markovic," 34000 Kragujevac, Yugoslavia

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22-25 Sept. 1986
1st World Congress on Computational Mechanics
Austin, TX
WCCM/TICOM Continuing Engineering Studies,
Cockrell Hall 10.324, University of Texas,
Austin, TX 78712;
Telephone: 512-471-3506

7-9 Oct. 1986
First Conference on Composite Materials—
American Society for Composites
Dayton, OH
Contact: Dr. Charles Browning,
Materials Laboratory, Wright-Patterson
Air Force Base, OH 45433

7-9 Oct. 1986
18th International SAMPE Technical Conference
Seattle, WA
Contact: Marge Smith, SAMPE, P.O. Box 2459,
Covina, CA 91722
Telephone: 818-331-0616

8-10 Oct. 1986
12th Polish Symposium on Experimental Research in Mechanics of Solids
Jadwisin near Warsaw, Poland
Contact: Prof. Jacek Stupnicki, Warsaw
Technical University, Nowowiejska 24, 00-665 Warsaw, Poland
Telephone 215463

2-5 Nov. 1986
SEM Fall Conference and Exhibit: Optical Methods in Composites
Keystone, CO
Society of Experimental Mechanics, 14 Fairfield Dr.,
Brookfield Center, CT 06805;
Telephone: 201-775-7373

2-7 Nov. 1986
2nd Symposium on Test Methods and Design Allowables
for Fiber Composites
Phoenix, AZ
Contact: M. E. Lieff, ASTM, 1916 Race St.,
Philadelphia, PA 19103
Telephone: 215-299-5516

7-12 Dec. 1986
ASME Winter Annual Meeting
Anaheim, CA
Contact: ASME, United Engineering Center,
345 E. 45th St., New York, NY 10017

5-10 Jan. 1987
2nd International Conference on Constitutive Laws for Engineering Materials
Tucson, AZ
Contact: C. S. Desai, University of Arizona,
Department of Civil Engineering and Engineering Mechanics,
Tucson, AZ 85721;
Telephone: 602-621-6569

20-25 July 1987
ICCM-VI, 6th International Conference on Composite Materials
London, England
Contact: Mr. F. L. Matthews, Director, Centre for Composite Materials, Imperial College,
Prince Consort Rd., London SW7, 2BY, England
Telephone: 441-589-511 X4003

27-30 July 1987
ECCM 2, Second European Conference on Composites Materials
London, England
Contact: European Association for Composite Materials, 2,
Place De La Bourse, 33076 Bordeaux,
Cedex, France
Telephone: 33 56 52 65 47

27-30 July 1987
4th International Conference on Composite Structures
Paisley, Scotland
Contact: Dr. I. H. Marshall, Dept. of Mechanical and Production Technology, Paisley College of Technology,
Paisley, Renfrewshire, Scotland
Telephone: 441-887-1241

Sept. 1987
Second Conference on Composite Materials—
American Society for Composites
Newark, DE
Contact: Dr. Charles Browning, Materials Laboratory,
Wright-Patterson Air Force Base, OH 45433

13-15 Oct. 1987
19th International SAMPE Technical Conference
Washington, DC
Contact: Marge Smith, SAMPE, P.O. Box 2459,
Covina, CA 91722
Telephone: 818-331-0616

15-20 Nov. 1987
ASME Winter Annual Meeting
New York, NY
Contact: ASME, United Engineering Center, 345 E. 45th St.,
New York, NY 10017

21-27 Aug. 1988
17th International Congress of Theoretical and Applied Mechanics
Grenoble, France
Contact: Prof. Germaine, Ecole Polytechnic, Paris, France

27-30 Sept. 1988
20th International SAMPE Technical Conference
Minneapolis, MN
Contact: Marge Smith, SAMPE, P.O. Box 2459,
Covina, CA 91722
Telephone: 818-331-0616

Calendar prepared by Prof. Michael W. Hyer,
Department of Mechanical Engineering,
The University of Maryland,
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BENEFITS AND FEES FOR 1986

- MEMBER - ANNUAL FEE $50.00 1 JANUARY - 31 DECEMBER
- ORGANIZATIONAL - ANNUAL FEE $350.00 1 JANUARY - 31 DECEMBER

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