Composites Contents

Listing of current literature of interest to the composites community as a service to our readers.

Introduction

In this section, the relevant portions of the tables of contents of current journals that publish composites articles are reproduced. The entire tables of contents are reproduced for dedicated composites journals, but only the composites-related articles of non-dedicated journals are shown. At this time, permission to reproduce the tables of contents has been granted by the following journals:

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- Cement and Concrete Composites
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- Composites Engineering
- Composites Science and Technology
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- Computers and Structures
- Engineering Fracture Mechanics
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- Journal of Testing and Evaluation
- Mechanics of Composite Materials
- Modal Analysis: The International Journal of Analytical and Experimental Modal Analysis
- Polymer Composites
- Polymers and Polymer Composites
- SAMPE Journal
- The Shock and Vibration Digest

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World of Composites

EDITOR'S NOTE:

This issue of the World of Composites will feature a review of activities in ASTM's Committee D-30 on Composite Materials. This will be followed by a brief summary of MIL-HDBK-17 activities. The announcement of a recent composite materials publication will complete this issue.

AMERICAN SOCIETY FOR TESTING AND MATERIALS

D-30's Fall '96 Meeting Reviewed

Committee D-30 on Composite Materials held its annual Fall Meeting in Nov. 1996 in New Orleans, Louisiana. The meeting featured a symposium plus a full schedule of subcommittee meetings. Summaries of all the committee activities follow.

Symposium on High Temperature and Environmental Effects on Polymeric Composites

Committee D-30 held a Symposium on Composite Materials in Non-Aerospace Applications on 19 Nov. 1996. Dr. Rod Martin of Materials Engineering Research Laboratory Ltd. and Prof. Abdul-Hamid Zureick of Georgia Tech served as the symposium co-chairmen. The symposium, which featured 12 papers, reviewed emerging uses of composite materials in infrastructure and marine applications. A special technical publication (STP) based on the symposium proceedings is anticipated.

Summaries of Subcommittee Activities

Subcommittee D30.01—Editorial

Chaired by Crystal Newton, Materials Science Corporation

The scope of Subcommittee D30.01 on Editorial and Reference Standards has been revised to include editorial review, terminology, and data recording. The subcommittee is balloting approximately 25 terms in the areas of fibers, damage, and specimen preparation. On-going activities include coordination of terminology with MIL-HDBK-17 and an overall review of terminology in all D-30 standards. Three documents will be ballots, revisions to the guides for the identification of composite materials and of fibers, fillers, and core materials. A new guide for material orientation codes will be drafted with plans for the inclusion of lay-up codes and braiding codes.

Subcommittee D30.02—Research and Mechanics

Chaired by Rod Martin, Materials Engineering Research Laboratory

The subcommittee's task groups addressed a variety of issues. Highlights are as follows.

The D30.02.01 Task Group on Energy Absorption, chaired by Karen Jackson of the U.S. Army, met to discuss the flat-plate crush test fixture that is being considered for a standard test method. The task group planned to prepare a preliminary test method document. It will be discussed in more detail following a workshop that is planned for the Spring ASTM meeting to be held in St. Louis, MO, in 1997. A strategic plan for the task group will also be prepared for the next meeting.

The D30.02.02 Task Group on Composites in Civil Engineering Applications met immediately after the Symposium and was Chaired by Abdul Zureick of Georgia Institute of Technology. Prof. Zureick stated that the uses of polymer composites in civil engineering applications would be in stand-alone structural shapes and as an external or internal reinforcement. The objective of the Task Group is to develop a Standard Guide for Testing Civil Engineering Polymer Composites. This guide would reference many existing D-30 standards and give recommendations on certain parameters that should be used with these grades of composites. It was the consensus from the meeting that this approach was more realistic than adding clauses in individual standards to allow them to be used. The guide would take the same approach as the Guide for Automotive Composites. A draft standard will be prepared for comment at the next meeting.

The main activity within D30.02.03 Task Group on International Standards Harmonization remains the progress of the tension testing round robin. This is reported in the D30.04 minutes. The continued existence of the Task Group was considered necessary to act as a focal point within D-30 for harmonization activities such as on the ASTM web site. Gene Camponeschi is the current
D-30 liaison to ISO and it was decided that he would be a more appropriate focal point for this Task Group.

A NASA Contractor Report (CR 4751, Sept. 1996) entitled Standard Test Methods for Textile Composites was distributed at the D30.02.04 Task Group meeting on Textile Composites, chaired by John Masters, Lockheed Martin Engineering and Sciences Company. This report will form the backbone of the ASTM guide on test parameters for textile composites. A draft will be written for the next meeting.

The Task Group on D30.02.05 on Round Robin Planning, Chaired by Ron Zabora of Boeing is currently evaluating the tension round robin for D30.04, a bearing round robin for D30.05, and interlaminar fracture round robins for D30.06. Their objective is to ensure that the tests are run correctly to achieve the aims of the round robins. The task group chairman expressed the importance of understanding the aim and objectives of the round robin, that is, is it for research purposes or generation of design allowables. He also emphasized the importance of beginning with a uniform set of test specimens.

Finally, the program for forthcoming symposia was discussed. The program is in flux because of the proposed joint meetings with MIL-HDBK-17.

Subcommittee D30.03—Constituent Properties

Chaired by James Ferrel, Hexcell Inc.

The subcommittee completed several key activities regarding its existing standards. The Chair reported that D 3544 (Guide for Reporting Test Methods and Results on High Modulus Fibers) passed main committee ballot. Several comments made by voters were addressed and the method was sent to society ballot. The chair also indicated that four other methods had completed subcommittee ballot. Method C 613 (Test Method for Resin Content of Carbon and Graphite Prepregs by Solvent Extraction) passed subcommittee ballot and will be sent to main committee ballot. However, negative votes were found persuasive on D 3171 (Test Method for Fiber Content of Resin-Matrix Composites by Matrix Digestion), D 3529 (Test Method for Resin Solids Content of Epoxy-Matrix Prepreg by Matrix Dissolution), and D 3530 (Test Method for Volatile Content of Epoxy Matrix Prepreg). They will be reballed at the subcommittee level pending modifications.

The subcommittee also discussed possible revisions to D 3800 (Test Method for Density of High Modulus Fibers). Minor changes were discussed for this method. It will be sent to subcommittee ballot in the Spring of 1997.

Finally, the subcommittee recommended that ownership of D 3379 (Test Method for Tensile Strength and Young's Modulus for High-Modulus Single-Filament Materials) be offered to Committee C-28's Subcommittee C28.07 on Ceramic Matrix Composites. A poll on the D30.03 membership indicated that none of the members used the standard in their work. (This recommendation was approved in the D-30 main committee meeting.)

Subcommittee D30.04—Lamina/Laminate Properties

Chaired by Richard E. Fields, Lockheed-Martin

Rich Fields announced his resignation as chair of D 30.04, after eight years of service. He expects to continue to be active in the committee. A successor has not yet been named; Rich will continue to act as chair in the interim while a search is being conducted.

A variety of standard test method actions were taken in the subcommittee's section meetings. A brief synopsis of key items is as follows. The actions are grouped by test type.

Tension—Testing and initial data reduction for the ASTM portion of the ASTM D 3039/ISO 527-5 tensile test round-robin has been completed. ASTM is awaiting test data from ISO and is, in the interim, evaluating test method performance based on the U.S. data and tracking down remaining anomalies in the data. A data review task group has been assigned, and final results should be available for the Spring D-30 meeting.

Compression—The first subcommittee draft of the revision to the sandwich beam test method, D 5467, was conducted. Several technical comments were received and deemed persuasive. They affect data reduction, and will be worked off-line before a second subcommittee draft.

Shear—Diane Hoyns will take over as technical lead for revision to the D 4255 rail shear test method. Peter Grant will become chair of the D30.04.03 shear section, replacing Sotiris Kellas, who can no longer participate.

Specimen preparation—Impressions of the existing specimen preparation guide from a new user were discussed, as well as the content for a new revision of the guide. Other plans were also discussed, including the proposed test methods for cured ply thickness of laminates and glass transition temperature, and a revision to the moisture absorption test method.

Flexure—The ISO draft flexure test method document will be reviewed by a D30.04 task group coordinated by Gene Camoneschi.

Subcommittee D30.05—Structural Properties

Chaired by Ron Zabora, Boeing Commercial Airplanes Company

The subcommittee discussed a variety of test method activities at its last meeting. Summaries of the key points are as follows.

Bearing Tests—The subcommittee held preliminary discussions with regard to future round robin testing in support of its bolt bearing test method development effort.

Plate Flexure—The chairman reported that development of a sandwich plate flexure test standard is progressing well. Investigators are resolving differences in plate shear and beam flexure methods of computing modulus. He also reported that the effort has gained a sponsor from automotive industry to supplement its marine industrial sponsorship.

Open Hole Compression and Compression After Impact Tests—Volunteers have been found to prepare drawings of fixtures for the open hole compression and the compression after impact test fixtures. The standards will be revised and reballed once the drawings have been received.

Subcommittee D30.06—Interlaminar Properties

Chaired by Rod Martin, Materials Engineering Research Laboratory for T. Kevin O'Brien, U. S. Army Research Lab

The subcommittee addressed a variety of standard test method issues in its meetings. A brief synopsis of key items is as follows.
Double Cantilever Beam Fatigue Standard—Rod Martin led a discussion regarding the latest ballot for the DCB fatigue standard. Technical changes were discussed to resolve three negative votes regarding the description of the delamination geometry, the loading frequency, and the compliance calibration.

Mode II Testing—James Reeder reviewed the status of the Mode II Round Robin test program being organized by VAMAS. Two action items were identified. The round robin’s objectives will be documented and disseminated to the committee. This documentation will then be reviewed to identify potential technical variables between labs and between specimens.

Mixed Mode II/Mode II Testing—Current standardization activities for Mixed Mode I/Mode II Bending (MMB) test methods were also reviewed. The scatter in the MMB test data was reviewed and observed to increase as the Mode II component increased. It was suggested that more replicate tests may be required to address the scatter. James Reeder will review the data to determine if a research round robin is required or if the committee can move forward with its standard development efforts using the data currently available.

Mode III Testing—The status of the Mode III Edge Crack Torsion test method development effort was also reviewed. The subcommittee is preparing to conduct investigative round robin testing.

Short Beam Shear Test—Peter Grant reported that he is more than half way through a new draft of the short beam shear standard. This new draft will include a change in the title to more accurately reflect the data generated by this test.

Interlaminar Tension—Wade Jackson reported on the task group’s activities and reviewed the curved beam test. Three laboratories have expressed an interest in supporting an investigative round robin. The task group is evaluating both four-point bend and flanged-bend tests.

Subcommittee D30.07—Metal Matrix Composites
Chaired by W. Steven Johnson, Georgia Institute of Technology

The Subcommittee is working closely with VAMAS to develop round robin test data that can be used to write standards. Two round robins are planned. The first is based upon continuous alumina fibers in an aluminum matrix supplied by 3-M. This material is currently being inspected at the University of Dayton Research Institute. It will then be cut into specimens at the National Physical Laboratory (NPL) in England. The test matrix will be composed of both room and elevated temperature tensile and fatigue tests. The effects of specimen geometry and heating sources on material response will be investigated in these tests. The second round robin is based upon titanium matrix composites purchased from Textron. These unidirectional composites will be inspected by NPL then machined by the Japanese at the NRIM. This round robin will also feature room and elevated temperature tensile and fatigue tests. However, the elevated temperature tests will be conducted at higher temperatures. The two studies will provide data for an elevated temperature fatigue test standard for metal matrix composites.

Committee D-30 will next meet on 5–8 May 1997 in St. Louis, MO. The Seventh Symposium on Composite Materials: Fatigue and Fracture will be held then. A full schedule of committee meetings will also be held. Please contact Katharine Morgan for further information. Her address at ASTM Headquarters is 100 Barr Harbor Drive, West Conshohocken PA 19428-2959 USA. Her telephone number is (610) 832-9721. She may also be reached at kmorgan@local.astm.org.

MIL-HDBK-17
Fall ’96 Meeting Reviewed

The MIL-HDBK-17 Coordination Groups met in September in Chicago, IL. Seven new committees/task groups were started in the Polymer Matrix Composites Coordination Group, four in the Composites for Spacecraft working group and three in the Guidelines working group with topics of damage tolerance, sandwich construction, and the building block approach for a range of applications.

The Metal Matrix and Ceramic Matrix Composite Coordination Groups continue to move forward toward the first release of their respective volumes. An additional highlight of the meeting was the Statistics Workshop on Regression Analysis by Dr. Mark Vangel.

Revisions of all three polymer matrix composite volumes, including a major reorganization of the guidelines volume, were released in Dec. 1997. The latest version of the handbook can be downloaded from the handbook homepage.

The next MMC meeting is scheduled for the week of 17 March 1997 in Dayton, OH. The next PMC/CMC meeting will be in Tucson, AZ, 14–17 April 1997. All three coordination groups will meet in conjunction with ASTM Committee D-30 in Williamsburg, VA, 7–12 Sept. 1997.

Additional information on the handbook and related activities can be found at http://www.udel.edu/army/.
RECENT COMPOSITES PUBLICATIONS

American Society for Composites Proceedings Published

Proceedings of the American Society for Composites: Eleventh Technical Conference


Now published, Proceedings of the American Society for Composites, 11th Technical Conference, contains over 1,100 pages of original information by composites materials specialists from the United States, Japan, Canada, and other countries. Advances in all types of composite materials were reported: polymer-matrix, metal-matrix (including titanium-matrix), and ceramic-matrix composites.

Edited by Dr. W. Steve Johnson, Georgia Institute of Technology, these 100 reports provide coverage on the materials, processes, performance, and applications of composite materials.

Topics in this collection include:

• Design & Analysis
• Damage Mechanics & Tolerance
• PMC Durability
• Micromechanics
• Compressive Behavior
• Polymers & Fibers
• Functionally Graded Composites
• Textile Composites
• Joints
• Constituent Materials
• Manufacturing Processes
• Applications.

Calendar on Composites

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

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

6–8 May 1997
ASTM Committee D-30 Seventh Symposium on Composite Materials—Fatigue and Fracture
St. Louis, Missouri
Contact: Barbara Stafford, ASTM 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; ph: 610-832-9621; fax: 610-832-9623; e-mail: bstaffor@local.astm.org

3–5 June 1997
International Conference on Fatigue of Composites, Eighth International Spring Meeting
Paris, France
Contact: Chantal Iannarelli, Congrès 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

8–11 June 1997
Thermal Stresses ’97. The Second International Symposium on Thermal Stresses and Related Topics
Rochester, New York.
Contact: Dr. R. B. Hetnarski, James E. Gleason Professor of Mechanical Engineering, Rochester Institute of Technology, 76 Lomb Memorial Drive, Rochester, NY 14623-5604, USA; ph: 716-475-5788; fax: 716-475-7710; e-mail: TS97@rit.edu; or Prof. N. Noda, Department of Mechanical Engineering, Shizuoka University, 5-1 Johokochi 3 chome, Hamamatsu, 432, Japan; ph: 81-53-478-1026; fax: 81-53-474-7499; e-mail: tmnoda@eng.shizuoka.ac.jp

24–26 June 1997
29th National Symposium on Fatigue and Fracture Mechanics
Stanford, California
Contacts: Tina L. Panontin, NASA Ames Research Center, MS 2134, Moffett Field, CA 94035; ph: 415-604-6757; e-mail: tina.panontin@hq.nasa.gov; Sheri D. Sheppard, Mechanical Engineering Department, Stanford University, Stanford, CA 94305; ph: 415-725-1590; e-mail: sheppard@cdr.stanford.edu
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29 June–2 July 1997
The 1997 Joint ASME AMD/ASCE EMD Summer Meeting (McNU ’97)
Northwestern University
Contact: Wing Kam Liu, Northwestern University, Department of Mechanical Engineering, 2145 Sheridan Road, Evanston, IL 60208-3111; ph: 708-491-7094; fax: 708-491-3915; e-mail: McNU91@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@acro.rmit.edu.au; http://www.acss.aero.rmit.edu.au/ICCM-11

7–12 September 1997
ASTM Committee D-30 on High Modulus Fibers and Their Composites Meeting
St. Louis, Missouri
Contact: Katharine Morgan, ASTM, 100 Barr Harbor Dr., West Conshohocken, PA 19428; ph: (610) 832-9721; fax: (610) 832-9666; e-mail: kmorgan@local.astm.org

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, VA 24061-0219 USA; ph: 540-231-5316; fax: 540-231-9187; e-mail: mrl@vtvmr.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: 0043-1-58758 63; e-mail: rossmanith@emch80.una.ac.at

6–8 October 1997
American Society for Composites, 12th Technical Conference on Composite Materials
Dearborn, Michigan
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: gibson@eng.wayne.edu

28–31 October 1997
5th Japan International SAMPE Symposium and Exhibition (JISSE-5)
Tokyo, Japan
Contact: Prof. M. Yamabe, Materials System Research Laboratory, Kanazawa Institute of Technology, 7-1 Ohgigaoka Nonoichi Ishikawa 921, Japan; ph: +81 762 94 6703; fax: +81 762 94 0183; e-mail: yamabe @neptune.cisp.kanazawa-it.ac.jp

4–7 May 1998
ASTM Committee D-30 on High Modulus Fibers and Their Composites Meeting
Atlanta, Georgia
Contact: Katharine Morgan, ASTM, 100 Barr Harbor Dr., West Conshohocken, PA 19428; ph: (610) 832-9721; fax: (610) 832-9666; e-mail: kmorgan@local.astm.org

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

2–4 November 1998
ASTM Committee D-30 on High Modulus Fibers and Their Composites Meeting
Norfolk, Virginia
Contact: Katharine Morgan, ASTM, 100 Barr Harbor Dr., West Conshohocken, PA 19428; ph: (610) 832-9721; fax: (610) 832-9666; e-mail: kmorgan@local.astm.org

Send items for this calendar to:
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