

World of Composites

News articles and announcements of interest to the composites technical community

Composite Materials

A call for papers is issued for the third ASTM symposium on Composite Materials: Fatigue and Fracture, sponsored by Committee D-30 on High Modulus Fibers and Their Composites. The symposium is scheduled for the week of 6-9 Nov. 1989, in Orlando, FL. Papers are solicited that cover all aspects of composite fatigue, fracture, impact, damage tolerance, and failure processes. Emphasis will be placed on continuous fiber reinforced composites used for structural applications. Specific topics of interest include: failure mechanics, fatigue behavior, environmental effects, delamination, damage tolerance, damage thresholds, durability, long-term behavior, nondestructive testing, damage mechanics, test methods, fracture toughness, impact, fail safety, damage growth models, design and analysis, thermomechanical behavior, and cumulative damage.

Prospective authors are requested to submit a title, a 500 to 1000 word abstract with key figures, and an ASTM paper submittal form by December 1, to Dorothy Savini, ASTM (215/299-5413). Additional information is available from the symposium chairman, T. Kevin O'Brien, U.S. Army Aerostructures Directorate ARTA AVSCOM, Mail Stop 188E, NASA Langley Research Ctr., Hampton, VA 23665 (804/865-2093).

A *Special Technical Publication* (STP) based on the symposium proceedings is anticipated by ASTM. Main authors will receive a complimentary copy of the volume(s) containing their papers. The main author is the author corresponding with the ASTM publication staff. All published authors may purchase reprints of the papers at cost.

Final manuscripts for the anticipated STP based on this symposium are due by 1 Aug. 1989. This deadline will be rigidly enforced. If a paper is submitted after the deadline, it may be forwarded to the appropriate ASTM journal to be considered for publication. No presentation will be allowed for any manuscript not received by the day of the symposium.

Composites in Medical Devices

Papers are solicited for a symposium on Composites as Materials of Construction for Medical Devices to be held in Nov. 1989, in Orlando, FL. The symposium is sponsored by Committee F-4 on Medical and Surgical Materials and Devices.

The symposium will broadly consider the use of composites as materials of construction for medical devices. For purposes of this symposium, a composite may be defined as "a material containing two or more substances, each existing in the composite as a separate chemical entity, and each contributing specific properties to

enhance, in some way, the performance of the composite when compared to the performance of the components considered separately."

Both research and applications oriented papers are invited. Topics of interest include:

- Performance characteristics including strength, fatigue, and modulus;
- Biocompatibility and biodegradability;
- Biodegradable or partly biodegradable composites;
- Laboratory and clinical performance; and
- Abrasion resistance.

Composites of interest are metal-metal, carbon-carbon, polymer-filler or fiber, polymer-polymer, and others.

Devices of interest are implants, orthopedic, cardiovascular, plastic surgery, neurosurgery, urology, and ophthalmology.

Applicable nonimplant devices include contact lenses; wound dressings; catheters; respiratory-assist devices; prosthetic devices including maxillofacial extraoral; dental; and others.

The symposium chairman is Eldon E. Frisch, Dow Corning Corp., 12334 Geddes Rd., Hemlock, MI 48626 (517/642-5201 ext. 2256).

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Final manuscripts for the anticipated STP based on this symposium are due by 1 July 1989. This deadline will be rigidly enforced. All papers not submitted to ASTM by the deadline will not be accepted for the STP. If a paper is submitted after the deadline, it may be forwarded to the appropriate ASTM journal to be considered for publication. Please contact D. Savini or the symposium chairman with deadline concerns.

Cryogenic Support Strap Assemblies to be Supplied by SCI for Superfluid Helium on Orbit Transfer (SHOOT) Flight Demonstration

Structural Composites Industries (SCI) of the Harsco Corporation has been selected by NASA/Goddard Space Flight Center to qualify and manufacture the composite thermal isolation support straps required for the Superfluid Helium On Orbit Transfer (SHOOT) Flight Experiment. The experiment is a joint effort between GSFC and ARC with support from JSC. The payload is scheduled for shuttle flight in mid-1991.

The purpose of SHOOT is to demonstrate the technology and critical operations required for liquid helium transfer in space. Many space operations require liquid helium for cooling detectors, instruments, and entire facilities to temperatures down to -454°F (-270°C). The depletion of the liquid helium dictates the lifetime of these operations. There are three methods of resupply: return the payload with dewar to earth for refill, replace the helium dewar in space, or transfer helium to the dewar from a supply dewar in space. Of these, the liquid helium transfer in orbit is believed the most cost effective.

The SHOOT supply dewars consist of two identical vacuum vessels mounted side by side. Each of these vessels enclose a 55-gal (7.4 ft^3 , 208 L) liquid helium tank that is suspended from the outer shell with six of SCIs filament wound S-2 glass/epoxy thermal isolation support straps. The tanks are also surrounded by two thermal shields cooled by the helium boiling off from the dewars. The straps and shields are necessary to maximize the liquid helium hold time.

The thermal isolation straps, which support the 216-lb (98-kg) helium tanks during flight operations, have dimensions of 0.800-in. (20.32-mm) width, 0.045-in. (1.143-mm) thickness, 1.000-in. (25.4-mm) pin-diameter, and 6.250-in. (158.75-mm) total inside length. SCI has already qualified the straps with a minimum spring rate of 58 000 lb/in. (10 156 kN/m) when exposed to loads from 0 to 6000 lb (0 to 2722 kg), an average tensile strength of

246 000 psi (1 695 924 MPa) and over 250 000 fatigue cycles when loaded between 200 and 4060 lb (91 and 1842 kg).

SHOOT is the precursor to the Superfluid Helium Tanker to be developed by JSC for the replenishment of payloads from the Space Shuttle and the Space Station. The requirements to be met by the user payloads to ensure they are serviceable will be defined from the developments of SHOOT. Thus, the objectives to the SHOOT experiment are to (1) demonstrate the containment, management and transfer of liquid helium through the various conditions and environments to be encountered during the servicing of payload in space, (2) validate and establish EVA hardware design, procedure, and performance criteria required for on orbit replenishment of payloads, and (3) demonstrate remote and autonomous servicing operations with ground or aft deck control, or both.

Some of the major projects that have used or plan to use liquid helium are the Infrared Astronomy Satellite (IRAS), the Cosmic Background Explorer (COBE), the Advanced X-Ray Astrophysics Facility (AXAF), the Space Infrared Telescope Facility (SIRTF), the Particular Astrophysics Magnet Facility (ASTROMAG), the Large Deployable Reflector (LDR), Gravity Probe-B (GP-B), the Lambda Point Experiment, and the Space Station Materials Processing Facility.

SCI provides advanced composite structures for many of these cryogenic systems. For further information contact: Vicki Lynn (714) 594-7777.

Calendar on Composites

6-9 Nov. 1988

Society for Experimental Mechanics Fall Conference

Indianapolis, IN

Contact: Kathy Ramsay, Society for Experimental Mechanics,
7 School St., Bethel, CT 06801

Telephone: 203-790-6373

22 Nov.-2 Dec. 1988

ASME Winter Annual Meeting

Chicago, IL

Contact: American Society of Mechanical Engineers, United Engineering Center, 345 E. 47th St., New York, NY 10017

20-24 March 1989

7th International Conference on Fracture

Houston, TX

Contact: Dr. Kamel Salama, Mechanical Engineering Dept., University of Houston-University Park, Houston, TX 77004

Telephone: 713-749-2244

28 May-2 June 1989

Society for Experimental Mechanics Spring Conference

Cambridge, MA

Contact: Kathy Ramsay, Society for Experimental Mechanics,
7 School St., Bethel, CT 06801

Telephone: 203-790-6373

25-28 Aug. 1989

7th International Conference on Composite Materials

Beijing, China

Contact: Tu Dezhang, China Society of Aeronautics and Astronautics, 67 South St., Jiao Daokou, Beijing, China

*Calendar prepared by Prof. Michael W. Hyer,
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