NIST Continues to Develop Consortium Style Materials Research

The National Institute of Standards and Technology continues to develop innovative working relationships and processes to advance materials.

Computer Modeling of Polymer Processing

NIST and the three major U.S. automakers, operating through the Automotive Composites Consortium, are working together to improve the processing of structural polymer composite materials to make them more reliable and cost effective. According to the agency, the project will focus on composites made by resin transfer molding and structural reaction injection molding.

NIST researchers will develop and use computer models to predict flow patterns and pressures during processing for both molding methods. The models will simulate the fabrication of a complex demonstration part made by the consortium using state-of-the-art processing and performance technologies.

Detecting Paint Defects

NIST is also looking into developing another government-industry consortium to develop an automated, nondestructive process to detect and evaluate defects in paints on metal products such as automobiles.

An automated detection system using computed image processing and robotics, together with techniques to "map" the surface of a product, would be faster and more precise than current detection systems, according to Jonathan Martin, a materials research engineer at NIST.

Research on coating defects, robotics, and nondestructive evaluation techniques could provide the basis for the new inspection technique, according to NIST. The work is being conducted by researchers in the NIST Building and the Fire Research and Manufacturing Engineering Laboratories.

The agency is sponsoring a workshop at its Gaithersburg, Maryland headquarters on May 9-10 to gauge industry reaction to the consortium idea.

Mixing Polymers and Superconductors

NIST scientists say that by mixing powdered ceramic superconducting materials with a polymer they have come up with a way to fabricate a new generation of materials with the magnetic levitation properties of superconductors—even though they do not conduct electric current.

Laboratory work has demonstrated that a ceramic superconductor placed in a matrix of polyvinylidene fluoride displays maglev properties, the researchers say. When a magnetic field is applied to the composite at superconducting temperatures, an electric current flows around the surface of each particle, creating a countermagnetic field that gives the composite its levitating properties.

The researchers have tried other polymers, but found polyvinylidene fluoride to possess the characteristics they were looking for most. The polymer acts as a binder and shields the particles from exposure to moisture and other chemically active substances that can destroy superconductivity. The three researchers, who have received a patent for the process, are Aime DeReggi, Chwan-Kang Chihang, and George Davis.

DOE Notes

Super Collider Cost Estimate Delivered to Congress

In early February, the Department of Energy released a report to Congress on the cost and schedule for the Superconducting Super Collider (SSC). The report documents a total project cost estimate of $8.249 billion in as-spent or inflated dollars with a completion date of Fiscal Year 1999.

DOE's initial SSC construction proposal to Congress in FY 1988 was for $5.3 billion, and was known to contain uncertainties affecting the estimate by ±10%. The estimate was raised to $5.9 billion in FY 1990 due to later starting and completion dates. The new $8.25 billion estimate for the total project is based on a detailed, site-specific conceptual design and includes costs associated with design and schedule changes made since the original conceptual design was prepared in 1986.

Primary changes include a doubling of the energy level of the injector accelerator and an increase of the inner diameter of superconducting magnets from 40 to 50 mm to provide improved uniformity of the magnetic field to guide proton beams. The technical changes were recommended unanimously by a blue ribbon subcommittee of the High Energy Physics Advisory Panel.

Copies of the report, *Report on the Superconducting Super Collider Cost and Schedule Baseline (DOE/ER-0468P,* are available from the DOE Public Inquiries Branch, Room 1E-206, Washington, DC, 20585; telephone (202) 586-5575.

https://doi.org/10.1557/S0883769400056840 Published online by Cambridge University Press

Technology Awards Announced for Cleanup and Waste Management

The DOE recently selected seven projects for funding under the Innovative Technology Development Program, which is designed to identify new technologies or applications of technologies with the potential to solve any of DOE's environmental cleanup or waste management problems. The seven research projects will share a total of $1.5 million, set aside for the first round of awards.

Current remediation technologies, based largely on moving and processing large volumes of contaminated soils and groundwater, are costly and time consuming. The DOE hopes to find innovative technologies that degrade, concentrate, or stabilize the contaminants and so improve the ability to meet schedules and reduce total cleanup costs. The selected proposals include:

A concept to extract and separate actinides and lanathanides from waste streams and soils (University of Idaho);

Using synthetic membranes to remove volatile organics from water (Membrane Technology and Research);

Using fiber-optic thermoluminescent dosimeters to monitor soil or waste storage (International Sensor Technology);

A way to isolate contaminated areas of aquifers through the placement of subsurface barriers (Research Triangle Institute);

Testing an improved method of using ultraviolet light, ultrasonic energy, and a catalyst to destroy organic contaminants (SRI International);

Using neural networks to simulate the flow of hazardous materials for characterization of specific sites (SAIC); and

Biologically treating trichloroethylene in contaminated airstreams (ABB Environmental Services).

For information on future solicitations, which will follow as money is made available, contact: Laura Shikashio, Innovative Technology Development Program, 785 DOE Place, Idaho Falls, ID 83403; telephone (208) 526-6789. □

https://doi.org/10.1557/S0883769400056840 Published online by Cambridge University Press