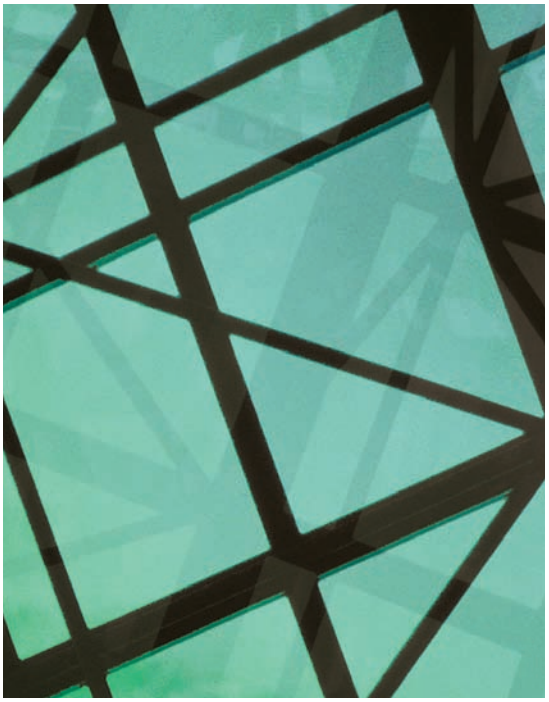
National Institute of BUILDING SCIENCES

Security & Disaster Preparedness

Advanced and High Performance Materials Council



Just as animals consist of organs that perform specific functions highly efficiently, buildings are constructed out of materials (such as cement, wood and glass) that should ideally perform at optimal levels. The challenge for the building industry is identifying which of these materials will best operate in certain capacities. When the optimal materials are specified (for reasons beyond cost) and installed correctly during construction, a building can be made more secure, energy-efficient and higher performing over its lifetime. The purpose of the Advanced and High Performance Materials Council (AMC) is to encourage the understanding and use of high-performance and advanced materials for construction by coordinating the research efforts of public and private institutions.

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Advanced and High Performance Materials Council

Over the last decade, research institutions, universities, national laboratories and industry have developed a large variety of materials for construction that address such attributes as resilience, durability and security—some of the hallmarks of a high-performing building—in order to respond to natural and manmade threats. However, the resulting materials are not always manufactured nor are the research findings necessarily shared effectively among the producers and end users of the materials. The AMC was established to foster and promote the design and adoption of new, innovative materials that meet a range of high-performance requirements, including dramatically reduced energy use and enhanced protection against natural and manmade disasters.

In 2009, the Department of Homeland Security (DHS) sponsored a Security, Energy and Environmental (SEE) Summit, which convened more than 50 government, environmental and industry leaders. Out of the Summit came two concerns: first, that the challenges brought on by climate change, the energy crisis and international security threats imposed great demands on infrastructure and construction, and second, that currently available construction materials were not efficient enough to meet these demands in a cost-effective manner. It was thought that one of the ways building efficiency could be improved was to encourage the development of newer, more advanced construction materials that could perform at a higher standard. DHS and the National Institute of Building Sciences resolved to form the AMC to address these concerns. The first meeting of the AMC convened in January of 2010.

With the uncertain global factors, DHS and the AMC are particularly interested in security. By identifying and incorporating the most suitable high-performance materials during construction (especially those that are resistant to natural and man-made phenomenon such as seismic activity, blasts, fire and weather), the resulting buildings will have greater longevity and security. With the availability of high-performance materials, DHS hopes to exceed current safety standards in a cost-effective manner.

Advanced Materials Database

One of the primary roles of the AMC is to oversee the establishment and maintenance of an Advanced Materials Database. This Institute-managed, publically available listing of high-performing materials is currently being compiled. The resulting Database provides detailed statistics and information on the properties of submitted materials, as well as briefs on potential applications and case studies on researched materials. A digital, standardized format will allow engineers, architects and scientists to readily compare different materials to aid in the selection process. It is hoped that such information will promote understanding and use of advanced materials in infrastructure and construction. The secondary role of the Database is to provide a forum of communication between member organizations and to prevent the duplication of effort. Beginning January 2011 the Database will accept submissions of new materials drawn from the DHS Infrastructure Protection and Disaster Management Division as well as contributing institutions from across the globe.

The Database can be publicly viewed at www.advancedmaterialscouncil.org or www.advmat.org. ■

Staff Contact: Drew N. Rouland, Project Manager
Email: drouland@nibs.org
Website: www.advmat.org

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