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Executive Summary Of the Advanced Desiccant Cooling And Dehumidification Program

DOE works with industry to develop desiccant cooling systems for broad space-conditioning markets to realize the potential of desiccant systems for reducing energy consumption and improving indoor air quality and comfort.

Desiccant cooling systems are energy efficient, cost effective, and environmentally safe. They are used as stand-alone systems or with conventional air-conditioning. In these systems, a desiccant removes moisture from the air. The dry air is cooled using either evaporative cooling or the cooling coils of a conventional air conditioner.

Commercially available desiccants include silica gel, activated alumina, natural and synthetic zeolites, titanium silicate, lithium chloride, and synthetic polymers. Currently, desiccant cooling and dehumidification systems are being used successfully in industrial and some commercial applications.

Desiccant technologies are being used to great advantage, although thus far only in small numbers, in various markets throughout the United States. They are the best choice in many applications. Supermarkets use them to reduce frost buildup on refrigerated cases and frozen products, extending product shelf life, as well as the intervals between expensive, energy-consuming defrost cycles. Desiccants contribute to a drier, cleaner, more comfortable environment in stores of all kinds.

Saving Energy and the Environment

Desiccant cooling systems are energy efficient and environmentally benign. According to one estimate, desiccant dehumidification could reduce total residential electricity demand by as much as 25% in humid regions, providing a drier, more comfortable, and cleaner indoor environment with a lower energy bill.

Desiccant systems also displace chlorofluorocarbon-based cooling equipment, the emissions from which contribute to the depletion of the Earth's ozone layer.

Partnering with Industry

Collaboration between government and industry is necessary to develop cost-effective, marketable systems that are energy efficient and environmentally safe.

The information and data generated through this collaboration will be disseminated to the HVAC industry, the desiccant community, architects, engineers, builders, utilities, and other end users through industry and professional society meetings, publications, conferences, and workshops.

AGCC has initiated a training program to educate design, engineering, and architectural firms and natural gas end users about the desiccant technology and its benefits.