

# ADMA PRODUCTS

## MEMBRANE DEHUMIDIFIER

<b>PROJECT TITLE:</b>	High-Efficiency, On-Line Membrane Air Dehumidifier Enabling Sensible Cooling for Warm and Humid Climates		
<b>ORGANIZATION:</b>	ADMA Products	<b>LOCATION:</b>	Hudson, OH
<b>PROGRAM:</b>	BREETIT	<b>ARPA-E AWARD:</b>	\$3,380,389
<b>TECH TOPIC:</b>	Building Efficiency	<b>PROJECT TERM:</b>	9/1/10 – 9/31/13
<b>WEBSITE:</b>	www.admaproducts.com		

### CRITICAL NEED

In hot and humid climates, air conditioners are less efficient because they require more energy to remove water from the moisture-rich air. More efficient cooling methods are necessary to reduce building energy consumption and environmental impact. Buildings currently account for 72% of the nation’s electricity use and 40% of our carbon dioxide (CO<sub>2</sub>) emissions each year, 5% of which comes directly from air conditioning. The refrigerants typically used in air conditioners are potent greenhouse gases (GHG) that may contribute to global climate change. Because the majority of cooling systems run on electricity, and most U.S. electricity comes from coal-fired power plants which produce CO<sub>2</sub>, there is a pressing need to support improvements that increase the efficiency of these technologies and reduce the use of GHG refrigerants.

### PROJECT INNOVATION + ADVANTAGES

ADMA Products is developing a foil-like membrane for air conditioners that efficiently removes moisture from humid air. ADMA Products’s metal foil-like membrane consists of a paper thin, porous metal sheet coated with a layer of water-loving molecules. This new membrane allows water vapor to permeate across the membrane at high fluxes and at the same time, blocks air penetration efficiently resulting in high selectivity. The high selectivity of the membrane translates to less energy use, while the high permeation fluxes result in a more compact device. The new materials and the flat foil-like nature of the membrane facilitate the mass production of a low-cost compact dehumidification device.



### IMPACT

If successful, ADMA Products’ membrane technology would be 50% more energy efficient for dehumidification and/or cooling of hot humid air than traditional air conditioners.

- **SECURITY:** Increased energy efficiency would decrease U.S. energy demand and reduce reliance on fossil fuels—strengthening U.S. energy security.
- **ENVIRONMENT:** Improved humidity control in buildings lowers energy use in air conditioning and reduces the production of mold and other irritants caused by high humidity, leading to healthier indoor environments.
- **ECONOMY:** Widespread adoption of this technology could reduce energy consumption for air conditioning of buildings—providing consumers with cost savings on energy bills.
- **JOBS:** As new technologies develop, there will be new job opportunities in the design, installation, testing, and maintenance of efficient heating and cooling systems.

### CONTACTS

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