THE PENNSYLVANIA STATE UNIVERSITY:
Reducing Drywall Waste by Utilizing Recycled Gypsum in Concrete

Impact: Every one ton of cement produced leads to 0.9 tons of CO_2 emissions. A small reduction in the amount of cement, which constitutes about 10% cement by weight, initiates a large environmental incentive for the concrete industry. Additionally, drywall accounts for 20-25% of construction waste. The chemical makeup also makes disposal of the product into landfills difficult. Wet gypsum contributes contaminating leachate to groundwater and is identified as a source of odorous gas production at landfill sites. Verified technology in recycled gypsum use eliminates the environmental concerns associated with disposal of recycled gypsum in landfill and at the same time address the CO_2 emission concerns associated with the cement manufacture. Due to growing interest in sustainable development, engineers and architects are often looking for new materials that are sustainable. Recycled gypsum will be a strong contender for such sustainable development.

Project Overview: Current investigations on the use of recycled gypsum are still in its infant stage. Working with USA Gypsum, research at The Pennsylvania State University will evaluate the performance characteristics of a series of Portland cement mix rations replaced with up to 20% gypsum by weight. Tests will be conducted to ASTM standards. Once suitable mixtures are identified, the study will then identify suitable markets (such as precast and cast-in-place concrete) for manufactured products. The proposed project fills the gap, both economic and research, towards large-scale commercialization.

GBA Product Innovation Grant Amount: $10,000

Leadership Team: The Pennsylvania State University's research team is lead by Dr. Shashi Marikunte; *Assistant Professor*. The industry partner is Terry Weaver; *President of USA Gypsum*. USA Gypsum was formed in 1998 to meet the need for gypsum drywall recycling and for agricultural gypsum products.

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Awarded May 2011