Scrap tires used to boost masonry blocks

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Dr. Mohamed A. ElGawady, associate professor of civil, architectural and environmental engineering (right) with graduate student Ahmed Gheni.

(Phys.org) —Scrap tires could gain a new purpose as ingredients for construction materials, thanks to research at Missouri University of Science and Technology.

Discarded tires are a big problem. Landfills are teeming with them and they can harbor disease-carrying mosquitoes and rodents. Stockpiles of old tires also burn easily—creating fires that can quickly get out of

control and may burn for months or even years.

But the longevity and resilience of scrap tires also makes them ideal for other uses.

Dr. Mohamed A. ElGawady, a researcher at Missouri S&T, is currently testing new masonry blocks made with ground tires.

"Rubber has a lot of benefits in addition to its sustainability," says ElGawady, associate professor of civil, architectural and environmental engineering. "It's very durable and provides good insulation. Among their many potential benefits, these new blocks could cut heating bills by 50 percent."

ElGawady has been working with Midwest Block and Brick, a Jefferson City, Mo.-based company, to create the blocks, which are made from sand and scrap tires ground to fine particles.

These rubber-added blocks, called rubberized blocks, were constructed with a variety of ratios of sand to rubber particles before coming up with the right balance.

"The rubber makes the blocks a bit weaker, so after testing various percentages, we now only replace about 20 percent of the sand with rubber, so the blocks retain their strength," ElGawady says.

He and his students use a compression machine to test and compare the strength of prisms built with the rubberized blocks to conventional concrete masonry blocks.

Both rubberized and conventional blocks are being tested in an environmental chamber at Missouri S&T. In the chamber, the blocks undergo cycles of extreme temperatures and humidity levels, simulating

different weather conditions. The rubberized blocks are also tested under cyclic compression loads simulating earthquake loads.

"Construction with these new blocks could improve a building's resiliency during an earthquake by acting as shock absorbers," says ElGawady.

Provided by Missouri University of Science and Technology