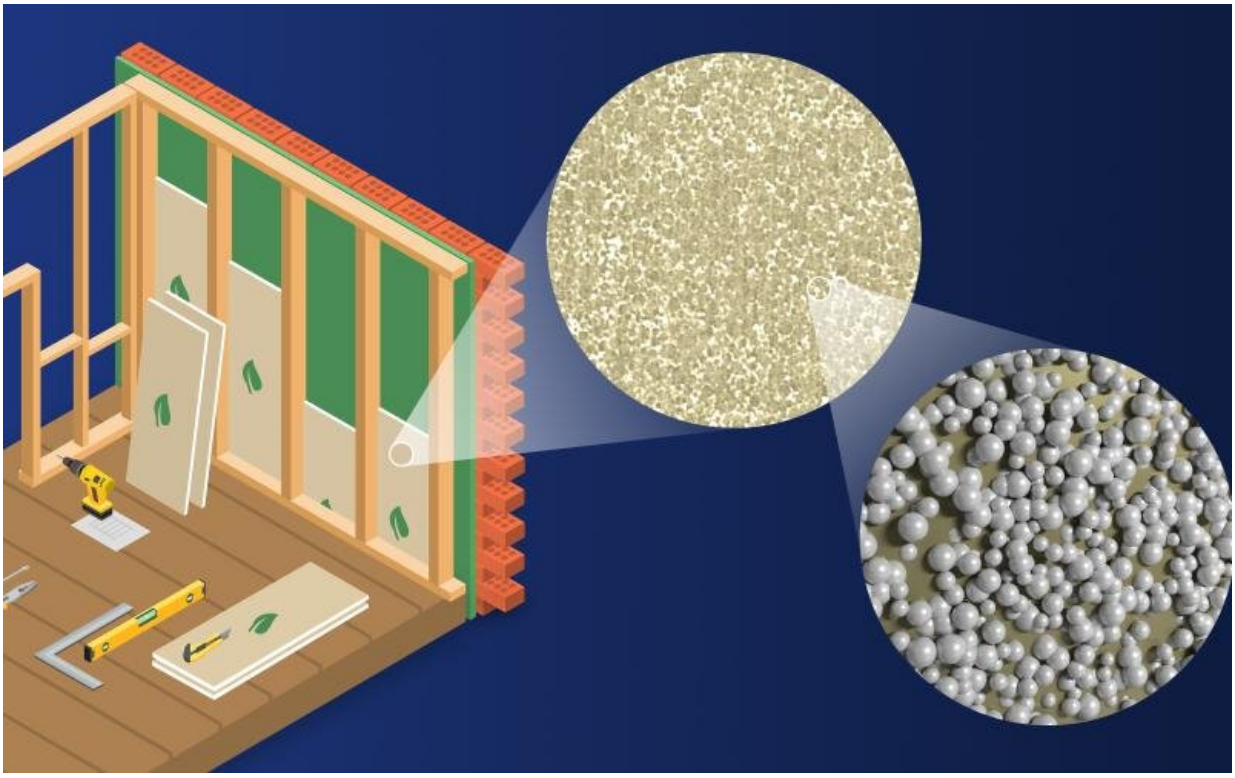
Eco-friendly foam can insulate buildings without warming the globe

March 23 2023



Researchers at Oak Ridge National Laboratory developed an eco-friendly foam insulation for improved building efficiency. Credit: Chad Malone/ORNL, U.S. Dept. of Energy

Rigid foam boards used to insulate buildings can prevent energy loss, making homes more efficient at keeping warm or cool. The advantages

in energy efficiency, however, are undercut by environmental concerns over polystyrene products. Blowing agents used in foam production, such as hydrocarbons and hydrofluoroolefins, end up in the atmosphere and contribute to global warming.

Scientists at Oak Ridge National Laboratory developed a competitive, eco-friendly alternative made without harmful blowing agents. The nontoxic thermoplastic foam is made using hollow glass spheres and expandable polymer microspheres.

"The combination of these two sources allows us to tailor formulations to maintain the material's thermal performance across a limited range of densities" said ORNL's Meghan Lamm. "We are also working with thermoset materials, which offer high-temperature stability, for improved flame resistance."

"The technology is readily adoptable by industry and opens avenues to develop safer composite foams for a variety of insulation systems," said ORNL's Tolga Aytug.

The paper is published in the journal *Polymer*.

More information: Meghan E. Lamm et al, Tailorable thermoplastic insulation foam composites enabled by porous-shell hollow glass spheres and expandable thermoplastic microspheres, *Polymer* (2022). DOI: 10.1016/j.polymer.2022.125652

Provided by Oak Ridge National Laboratory

https://phys.org/news/2023-03-eco-friendly-foam-insulate-globe.html