



# Application of Smoothed Particle Hydrodynamics to the Resonant Acoustic Mixing of Complex, Highly-Filled Composites

Lewtas Science & Technologies are improving the safety and speed of mixing energetic materials together with the help of computational models, through support from the Hartree Centre and STFC's Bridging for Innovators programme.

## Challenge

Traditional methods of mixing energetic liquid and solid materials together consist of a vessel with moving blades. Such mixing can be dangerous and take many hours for the materials to combine. Existing technology often results in wastage, and a significant loss of time and money.

A new technology using a Resonant Acoustic Mixer (RAM) has no internal moving parts and promises to make the process much safer and more efficient. However, the science is not yet understood on how this technology works and it is difficult to predict the outcome of mixing both liquid and solid components.

## Solution

Funding through the Bridging for Innovators Programme enabled Lewtas Science & Technologies to apply computational methods to simulate the movement of particles and fluid in this new mixing technology to improve the outcomes. Working with scientists at the Hartree Centre, Lewtas was able to control all the variables in a fast and

systematic way. The results from this predicted work will be compared with experimental data to ensure accurate models are created, offering an opportunity to pave way for other simulations in the future.

## Benefits

The initial project with the Hartree Centre demonstrated the potential to improve the mixing process by using computational models. Predicting the outcomes using this simulation model makes products that are more consistent and saves time and money by improving the chance of successful mixing in real life experiments. Lewtas plans to continue the exploratory work to develop simulations for different types of materials.

"The opportunity to work with the scientists at the Hartree Centre with the support of the Bridging for Innovators programme has enabled ground-breaking work to progress, which has the potential to change research in this area. Without the funding and expertise, Lewtas would not have had the opportunity to carry out this important research."

**Ken Lewtas**  
Lewtas Science  
& Technologies

## About us

Science and Technology Facilities Council offers entrepreneurs, start-ups, SMEs and corporates the facilities, environment and people needed to de-risk innovation and accelerate business growth.

Through access to large-scale science facilities, complementary technologies and IP, and a flourishing network of science and industry experts, companies can create and transform products.

Bridging for Innovators provides funding for companies to utilise STFC facilities and expertise to fast-track solutions to industrial challenges and boost productivity.

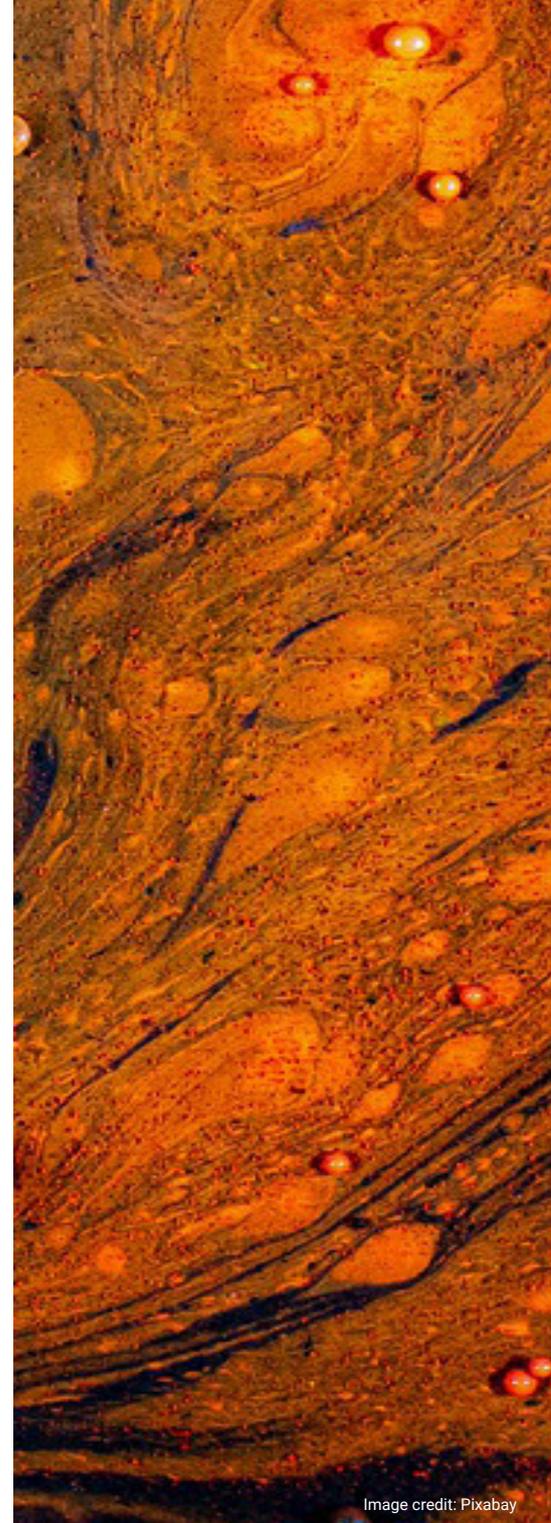


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