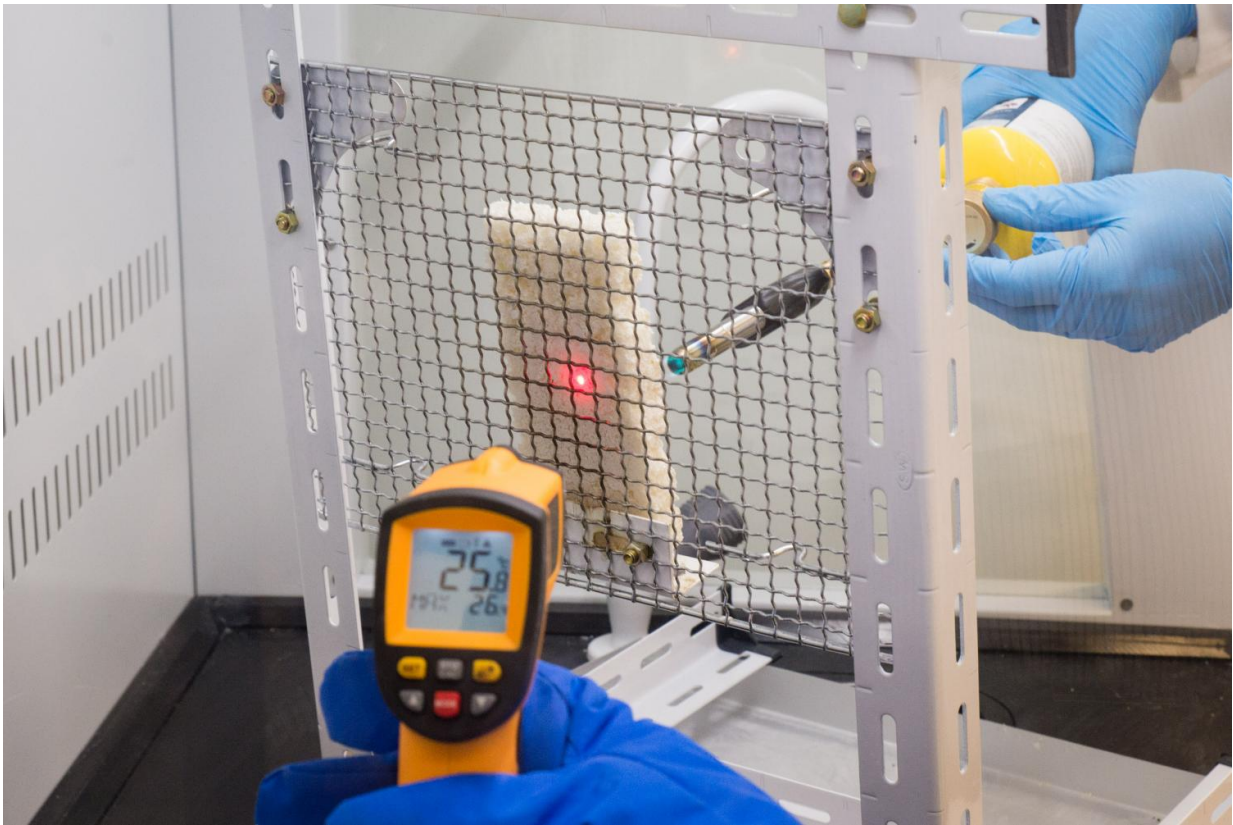


# Team develops thin foam that keeps vehicles and buildings cooler and quieter

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NTU thin foam is subjected to 1,100 degrees Celsius flame from a blowtorch. Its rear remains cool at 26 degrees, demonstrating its effectiveness as a heat insulator and its non-flammable properties. Credit: NTU Singapore

Nanyang Technological University, Singapore (NTU Singapore) has

developed a new material that will make vehicles and buildings cooler and quieter compared to current insulation materials in the market.

Known as aerogel composites, this new [foam](#) insulates against heat 2.6 times better than conventional insulation foam.

When compared to traditional materials used in soundproofing, it can block out 80 per cent of outside noise, 30 per cent more than the usual ones.

Made from silica aerogels with a few other additives, this new material is now ready for commercialisation and is expected to hit the market early next year. The promising product has the potential to be used in a wide range of applications, including in building and construction, oil and gas and the automotive industry.

The aerogel composites took NTU Assoc Prof Sunil Chandrankant Joshi and his then-PhD student, Dr Mahesh Sachithanadam, four years to develop. The technology had been published in peer-reviewed scientific journals and a patent has been filed by NTU's innovation and enterprise arm NTUitive.

A local company, Bronx Creative & Design Center Pte Ltd (BDC), has licensed this aerogel composites technology with a joint venture of S\$7 million (USD\$5.2 million), and a production plant that will be operational by 2017.

It will produce the aerogel composites in various forms such as sheets or panels, in line with current industry sizes.

Assoc Prof Sunil said the foam will be easy to install and use as it is thinner than conventional foam yet has better performance.

"Our NTU thin foam is also greener to manufacture, as it does not require high heat treatment or toxic materials in its production. It is therefore a lot more eco-friendly and less hazardous to the environment," explained Prof Sunil who is from NTU's School of Mechanical and Aerospace Engineering.

Mr Thomas Ng, R&D Director of BDC, said this new material could address a real market need for high-performance heat insulation and better sound proofing.

"With the global industries moving towards green manufacturing and a lowered carbon footprint, the new foam we produce will help address their needs and yet give a better performance," Mr Ng said.

"Moving forward, we hope to show the current market that going green doesn't mean that performance has to be compromised. We will be working with industry partners and certified testing labs to achieve the relevant standards and certifications.

"BDC has plans to have a footprint locally as we are now in talks with a few local parties to make this happen, in line with Singapore's vision of being a global leader in the Advanced Manufacturing and Engineering sector," he added.

BDC has various negotiations underway with other companies to expand the production to India and various Southeast Asia countries within the next three years.

## **High Performance Foam**

The new aerogel composite has been branded "Bronx AeroSil" by BDC and is being developed for various applications by Dr Mahesh, now the Chief Technology Officer at BDC.

For example, to reduce the noise generated by a truck driving by to that of a normal conversation, only 15mm of the new material would be needed. On the other hand, common insulation foam requires a thickness of 25mm.

The aerogel composite can reduce noise by as much as 80 per cent whereas normal foam only reduces sound by 50 per cent, explained Dr Mahesh.

Against heat, Bronx AeroSil which is 50 per cent thinner than conventional foam will still out-perform it by 37 per cent.

"For both heat insulation and sound-proofing, we can now use less material to achieve the same effect, which will also lower the overall material and logistic costs," Dr Mahesh said.

Apart from being a good thermal and acoustic insulator, it is also non-flammable - a crucial factor for materials used in high heat environments common in the oil and gas industries.

It is also resilient and can withstand high compression or heavy loads. A small 10cm by 10cm piece of the aerogel composite material weighing just 15 grams can take up to 300 kilogrammes of weight, maintaining its shape without being flattened.

In the first quarter of next year, BDC will begin mass producing the aerogel composites for their clients, which include companies from the automotive, electronics, and oil and gas sectors.

Further research and optimisation would be carried out to improve the performance of the aerogel composite material to ensure it maintains its competitiveness edge against other technologies, said Dr Mahesh.

Provided by Nanyang Technological University

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