Scientists in Singapore have developed a stick-on wrap that can make walls bomb-resistant

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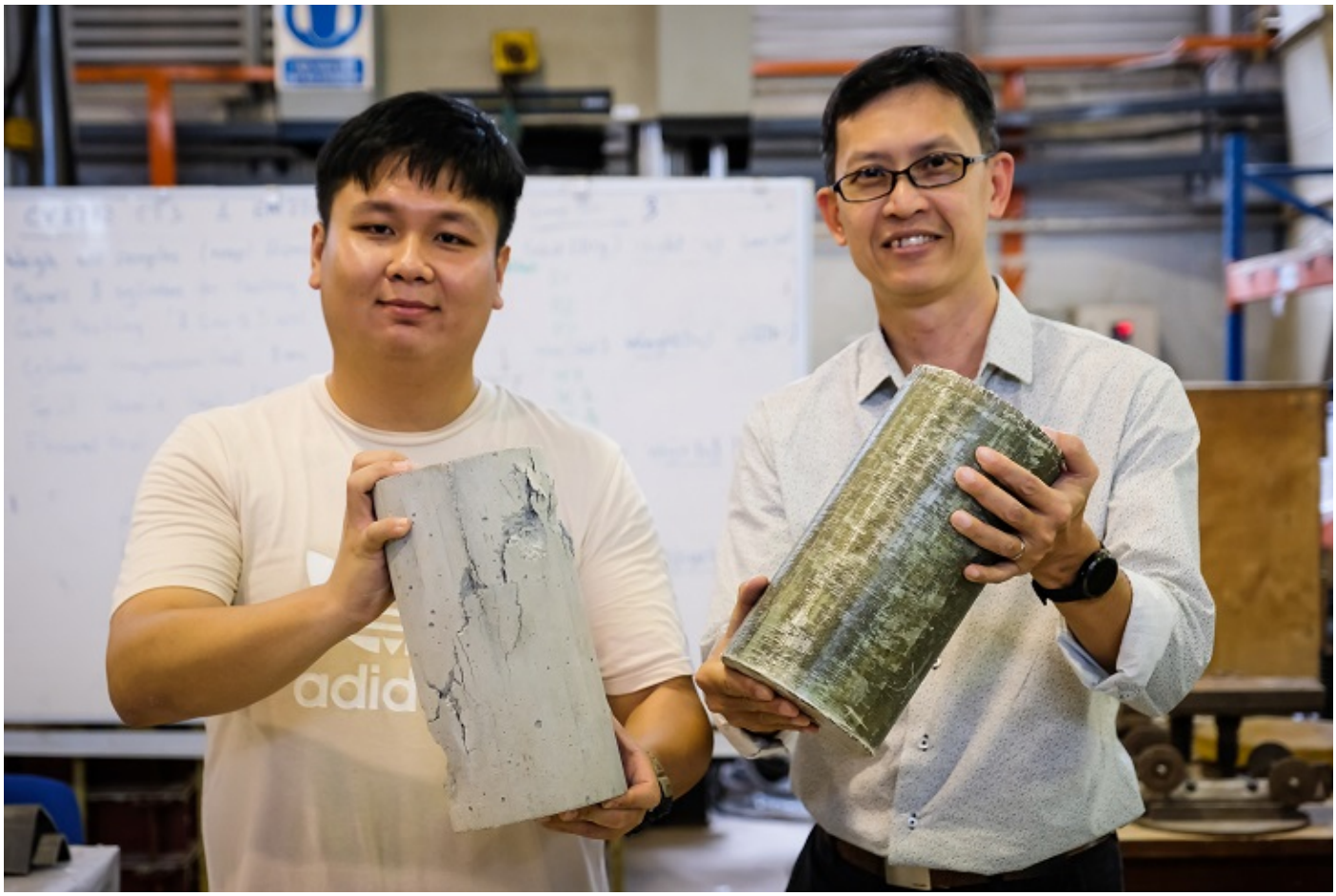

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A ready-to-stick wrap is not something you'd expect to help buildings and infrastructure withstand extreme loads and bomb blasts.

A team of scientists in Singapore have created a new type of material that has been tested to strengthen buildings – and even make them bomb-resistant.

In a media release published on Monday (April 8), Nanyang Technological University (NTU) said that this new technology would be able to rehabilitate ageing

infrastructure that have developed issues such as cracks and delamination of concrete.

How the wrap works

The FasRaP – short for Fast Wrapping Fibre Reinforced Polymer (FRP) – is created using commercially available glass fibres.

FasRaP contains a proprietary glue-like resin which acts as an adhesive for the wrap developed by NTU materials scientists, NTU said.

The team added that the resin will only harden when exposed to light, so the FasRap can pre-applied in the factory and packaged into a ready roll of sticky wrap, similar to double-sided tape.

Prefabricating FasRaP with resin glue in the factory ensures consistency in quality because of better controlled conditions and monitoring processes, the team explained.

At the work site, FasRaP is applied directly onto the wall or pillar, then left to harden, NTU said. According to the press release, only three workers are required to complete the job.

The team claims that other fibre reinforced polymers currently available in the market typically require a team of up to six workers to install. Additionally,

conventional resins need to be manually applied on site.

Signs of bomb-resistance

An industry-standard blast test conducted by NTU revealed that FasRaP could potentially make walls of buildings bomb-resistant.

Nanyang Technological University

According to NTU, the blast tests were conducted at two and four bars above atmospheric pressure. In both tests, the walls with reinforced FasRaP were left largely undamaged.

In a load test, NTU found that FasRaP was proven to be as strong, if not stronger than conventional fibre reinforced polymer.

According to NTU, demo tests on Monday, showed that a bare concrete cylinder fractures at 52,000 kgs of loading.

Nanyang Technological University

In comparison, FasRaP-reinforced concrete cylinder surpassed 120,000kgs before fracturing.

Currently, the research team – consisting of scientists and engineers from NTU and JTC corporation – is working to commercialise FasRaP by identifying suitable infrastructure projects where they can deploy this new technology.