


GROUND BREAKING STRUCTURAL TECHNOLOGY • GROUND BREAKING STRUCTURAL TECHNOLOGY • GROUND BREAKING STRUCTURAL TECHNOLOGY • GROUND BREAKING STRUCTURAL TECHNOLOGY

LIQUID GRANITE

CHANGING THE WAY PROFESSIONALS T

What is **LIQUID GRANITE**?

Liquid Granite is a new material developed by Sheffield Hallam University. It utilises groundbreaking technology which will change the way professionals think about structural concrete, engineered stone and all the associated fields within these sectors of the construction industry.

In today's construction industry, there is a requirement for technology-based advances that will yield robust building materials coupled with a demand for improved resistance to fire and heat. There is also a need for greater versatility from the materials that make up the fabric of our buildings and surroundings. Liquid Granite meets these requirements and has a reduced environmental impact compared to conventional materials.

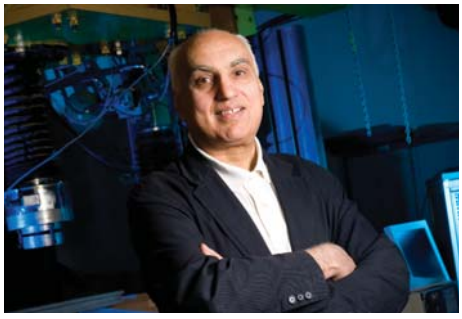
THINK ABOUT STRUCTURAL CONCRETE

Sheffield Hallam University

Following many years of research at Sheffield Hallam University, Liquid Granite comes as a real breakthrough in reducing fire risk in building construction. Using the University's extensive knowledge, coupled with its first class research facilities, Sheffield Hallam University has developed a material to compete with the best in the business.

Sheffield Hallam University

Pal Mangat - Professor Pal Mangat (picture right) is the Director of the Centre for Infrastructure Management at Sheffield Hallam University (www.shu.ac.uk/cim). He has an extensive track record of research and innovation in the construction materials field which has been funded over many years by the European Commission, UK research councils, Government bodies and industry. Liquid Granite is the culmination of his R&D effort of over ten years.



www.liquidgranite.co.uk

Testing **LIQUID** GRANITE

As a revolutionary new construction material, Liquid Granite has been the subject of many testing procedures which have all produced favourable results. So new is the material that tests are ongoing with results being made available on request.

IMPROVED QUALITIES AND VERSATILIT

Heat

Bodycote Warrington Fire offers a comprehensive range of fire safety services to an International market. They are the largest independent fire testing, consultancy, research and certification organisation in the UK and have a significant presence in Europe, Asia, Australia and the Middle East. Companies from all over the world work with their scientists and engineers to address a wide range of fire safety problems. With their impressive reputation and undoubted skills we have turned to Bodycote Warrington to conduct the fire testing required to ensure Liquid Granite delivers when it matters most.

Strength

Liquid Granite can be manufactured to comply with the toughest standards. Compressive strengths of up to 80N/mm^2 have been achieved. A recent cold load test of a 2.7 metre long lintel made from Liquid Granite was conducted at Sheffield Hallam University and gave results above the designed failure load.

The beam was tested under 4-point bending over a span of 2.7m. Load was applied through a hydraulic system at a constant displacement rate of 0.5mm/min. A load deflection plot was recorded.

During the test the load deflection plot remains practically linear up to an applied load W of 26.2KN at each of the two load points. The corresponding serviceability load required in the Warrington Fire Research test is approximately 18KN.
The beam deflection at this loading was 11.5mm and the crack width was less than 3mm. The ultimate failure load of the lintel was 64.6KN (each point load W being 32.3KN).

Y FOR THE CONSTRUCTION INDUSTRY

Reinforcement

Liquid Granite will accept the same levels, types and procedure for reinforcement as concrete, which can be determined by the structural engineer for the specific project.

Moisture

Liquid Granite has excellent moisture resisting properties. Absorption values were determined following the drying and soaking procedures given in the standard absorption test methods for concrete, BS 1881:Part 122:1983 and ASTM C642-90. The water absorption value of Liquid Granite was tested and found to be as low as 5.18%. In comparison the absorption value of standard concrete ranged between 9.39% and 12.41%.

This means that with its low capillary action it is an ideal material for use in wet or damp environments such as basements, sea defences, etc.

Eco Benefits

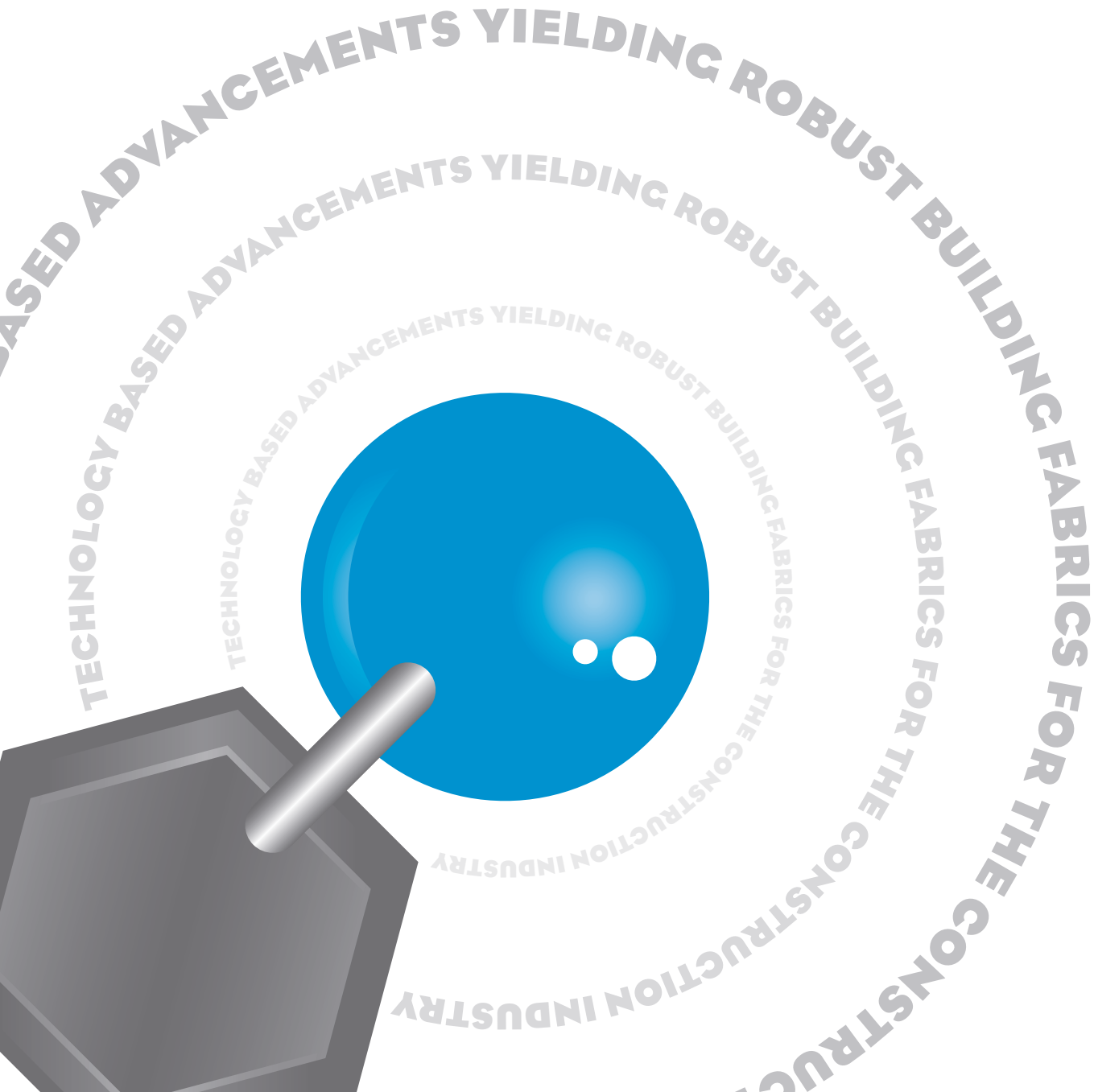
Cement production is one of the highest energy intensive CO2 producing industries in the world. Liquid Granite uses less than 5% cement with the potential to reduce this content even further. This is over 60% less than most traditional concrete products.

It takes the science of cement replacement to a whole new level, meaning the end user can confidently make a significant step forward by reducing the environmental impact of any project using Liquid Granite.

LIQUID GRANITE Applications

A number of applications for Liquid granite have been identified and are described on the facing page.

The range of potential applications for this unique material is extensive and we would be happy to discuss the ways in which Liquid Granite can be utilised to add value to your business.



Engineered Stone

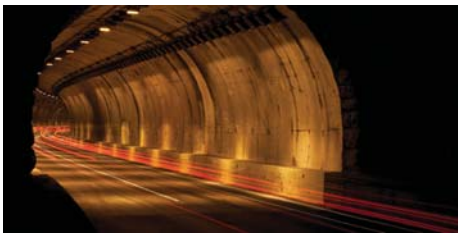
Liquid Granite provides a 'green' alternative to natural stone without compromising on durability, quality or looks.

Its specialist mixing and setting characteristics enable even the most complex of shapes to be cast, whilst its durability and finish allow it to be used in areas where even the most demanding of finishes are expected.

Structural Concrete

Liquid Granite can be used to replace normal structural concrete and provide fire rated sections, as Liquid Granite does not spall in a fire situation like normal concrete it introduces the possibility of reducing the section dimensions.

Tests carried out to BS 476 showing Liquid Granite's reaction to fire and the physical properties testing conducted by Sheffield Hallam University, show the materials advantages over normal structural concrete.



Refractory Environments

Liquid Granite has been tested by CERAM, one of the leading test facilities in its field. They are a UKAS accredited facility and have tested Liquid Granite to BS EN 993-10: 1998.

Combining the robustness of concrete with the thermal resistance of a refractory castable, Liquid Granite can also be used to provide extremely durable flooring around furnaces etc.

LIQUID GRANITE

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