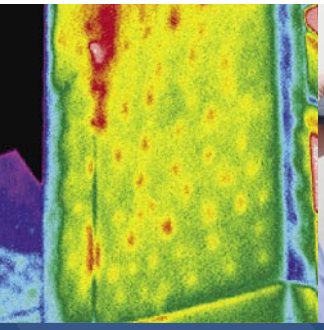
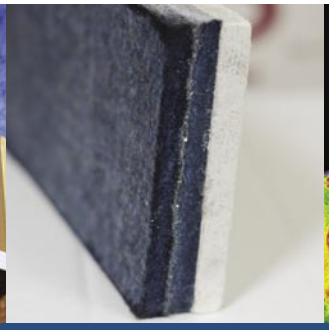
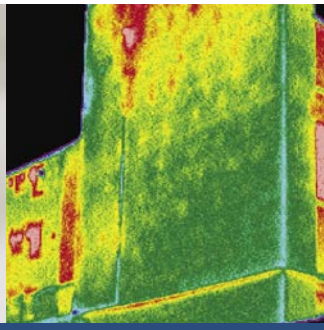
INNOVATION **BUILT ON** EXPERIENCE

proctor GROUP LTD

SPACETHERM®

NEXT GENERATION INSULATION SYSTEMS



ACOUSTIC INSULATION
CONSTRUCTION MEMBRANES
GEOSYNTHETIC ENGINEERING
METAL ROOFING TILES
THERMAL INSULATION
TIMBER CLADDING
VIBRATION ISOLATION

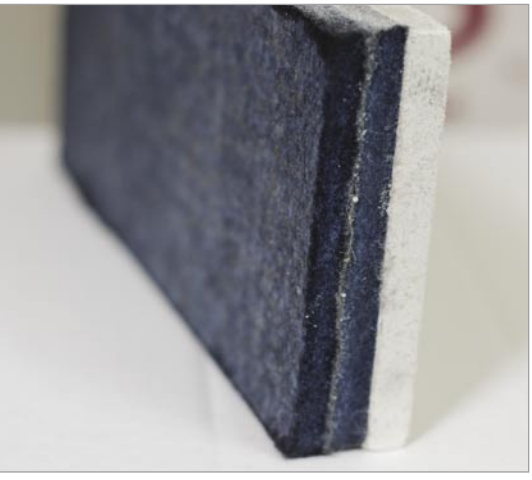
aspen aerogels

A. Proctor Group Head Office (The Haugh Blairgowrie)

For over 40 years, the A. Proctor Group Ltd has been developing thermal solutions to meet the increasing insulation standards required by the construction industry. However, with the recent drive by the government to dramatically reduce the CO^2 emissions associated with the "built environment," the required thickness of traditional insulation is increasingly undesirable and impractical.

In order to keep pace with the evolving performance requirements, whilst minimising the impact on building footprint and interior space, the A. Proctor Group, in conjunction with Aspen Aerogel, is proud to introduce the next generation of insulation systems to the UK construction market.

A STEP CHANGE IN THERMAL MANAGEMENT **AND ENERGY CONSERVATION**



The Spacetherm® range of High Performance Laminates provides unrivalled performance for thickness, with a class leading thermal conductivity of 0.013 W/mK. This outstanding performance is delivered through the use of Aerogel insulation, bonded to various facings, thus providing a traditional thermal laminate board with performance far in excess of anything previously available.

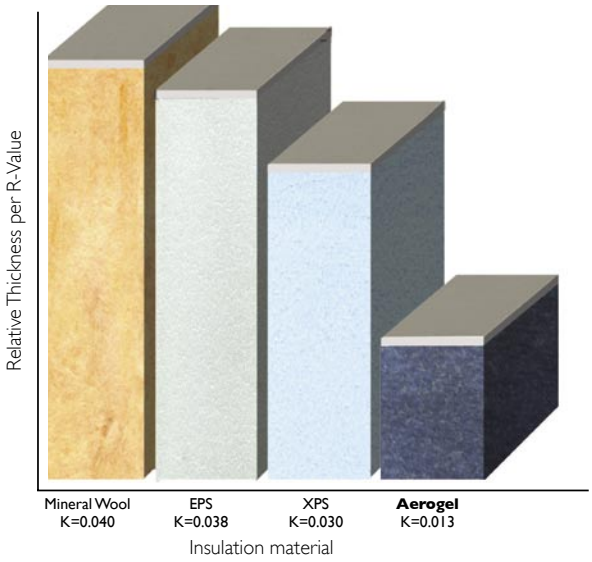
The unique performance of the Spacetherm® panels allows the easy upgrading of existing properties, with the minimum possible loss of internal space, without having to resort to expensive and awkward external insulation systems.

THE HIGHEST LEVEL OF THERMAL INSULATION POSSIBLE

Aerogel is a low density solid derived from a gel in which the liquid component has been replaced by air using a process known as supercritical drying. This results in a material with remarkable insulation properties.

By combining the superinsulation performance of aerogel with the flexibility and robustness of a non woven polyester carrier, Aspen Aerogel have developed a unique high technology manufacturing process. For the first time this allows the performance of Aerogel to be utilised in a wide range of practical applications. Historically, use has been limited to industrial and petrochemical. However in partnership with A. Proctor Group Ltd, the high performance of this material will be offered as a unique solution in building and construction applications.

When compared to traditional thermal laminates Spacetherm Panels provide consistently superior thermal performance.



The chart above shows the comparative thickness of various insulants relative to mineral fibre.

U Value - Performance Ready Reckoner - Spacetherm®

Spacetherm®	-	9mm	18mm	27mm	36mm
Timber Frame (89mm Stud)	0.43	0.33	0.27	0.23	0.19
Solid Brick	2.05	0.86	0.55	0.40	0.32
Brick Wall - Cavity	1.44	0.73	0.55	0.37	0.30
Brick Wall - Insulated	0.58	0.42	0.33	0.27	0.23

Insulation thickness excluding 10mm Fermacell

Construction

Construction Base used on above calcs – Substituting Spacetherm thickness as appropriate.

Brick Wall (with cavity)
10mm Fermacell
Spacetherm®
102 Brick
50mm cavity
102 Brick

Brick Wall (with Insulation)
10mm Fermacell
Spacetherm®
102 Brick
50mm mineral wool*
102 Brick

* Insulation K Value = 0.04 W/m.k

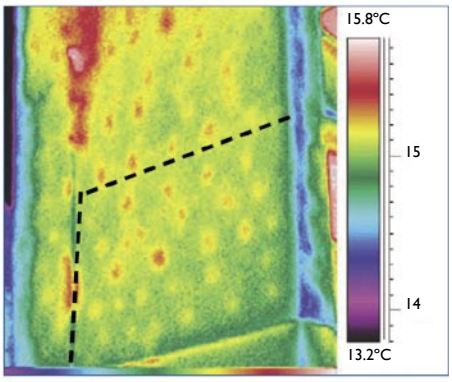
Timber Frame
102 Brick
50mm cavity unventilated
Frameshield 100
9mm OSB
89mm Timber Stud - 15% Bridging
Spacetherm®
10mm Fermacell

Solid Brick
220mm Solid Brick
Spacetherm®
10mm Fermacell

CASE STUDY: **LIMITED SPACE REFURBISHMENT**

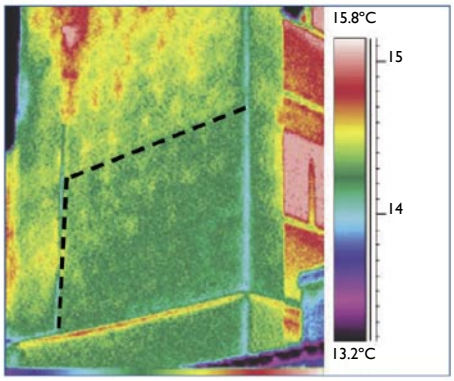
Forfar project with visible mould growth on wall

Average 0.628 W/m²K



Before

Average 0.350 W/m²K



After

The Problem:
In the last few years the government has, as part of it's continued commitment to promote energy efficiency and improve housing standards, introduced the Decent Homes Standard (for England and Wales) and the Scottish Housing Quality Standard. These standards apply to social housing and council housing stock and require that affected properties be upgraded by 2010 (England & Wales) or 2015 (Scotland).

The requirements to increase energy efficiency, in particular, can cause problems in housing stock where space for additional thermal insulation is limited. In such cases it may be necessary to consider external insulation systems, however this is not without problems. External systems can be difficult and expensive to install, and require the upgrading of entire blocks at once, which, if owner occupiers are present, may not be possible.

The Solution:
In February 2007 the A. Proctor Group, in conjunction with Angus Council, undertook a trial project to investigate the use of Spacetherm®- F laminate in order to increase the thermal performance of existing housing stock. By using 30mm Spacetherm® laminate panels the average u-value for the walls was reduced from 0.628 W/m²K to 0.35 W/m²K, giving a near 100% improvement in fabric insulation levels.

The system also greatly increased the uniformity of the insulation, reducing the potential for cold spots and subsequent mould growth. This internally applied system allows the council to upgrade properties quickly and easily, causing minimum disruption to tenants, and reducing the loss of internal space as far as possible. Because Spacetherm®- F laminate requires no specialist training to install, this can be accomplished using existing contractors, or even incorporated into existing upgrade programs.

LOW ENVIRONMENTAL IMPACT: HIGH PERFORMANCE

Traditionally, when using high performance materials we associate a level of negative impact on the environment due to high production costs and high energy consumption required during the manufacturing process. Spacetherm's® insulation blanket is setting a new standard for low environmental impact whilst leading the field with it's unrivalled thermal performance. Spacetherm's® unique Aerogel insulation has been age tested to show that it retains it's thermal performance for a period of 60 years. The Fermacell board, which is laminated to Spacetherm® insulation blanket has a 50 year durability statement further emphasising the robustness of the solution. Fermacell is also manufactured using 100% recycled material which reduces the products environmental impact.

Not only is Spacetherm® a relatively low energy solution to produce due to it's low Embodied Energy and CO^2 production units, it also has unique characteristics such as non encouragement of mould growth and it's classification as a non irritant. Construction Professionals will also be interested to know that Spacetherm's® insulation blanket has a ZERO Ozone Depletion Potential and it's Global Warming Potential is less than 5 bringing it well within the requirements of the Montreal Protocol.

As part of our commitment to providing sustainable energy and CO^2 saving solutions Spacetherm® has been put through the CERT Accreditation Process and is now recognised as an energy saving measure by Ofgem. We are currently in the process of gaining BRE certification and updates will be available via **www.spacetherm.com**

Physical Properties

Board size	1.2m x 2.4m
Thickness of Spacetherm® Insulation blanket without finish	3mm, 6mm and 9mm *(larger thickness available using these combinations)*
Reaction to Fire Classification according to (EN13501-1)	E
Thermal Conductivity according to (EN 12667 W/(m-K)	0.013
Ozone Depletion Potential (ODP)	0
Global Warming Potential (GWP)	<5
Resistance to Water Penetration (BS EN 20811)	83cm Hydrostatic Head 9mm Spacetherm® Blanket
Irritation classification as per Epiderm test	24 = Non-Irritant Classification
Fungal Resistance (ASTM C1338)	Zero Potential

SPACETHERM®-F (FERMACELL)

The Spacetherm®-F laminate comprises Spacetherm® insulation blanket bonded to Fermacell. The unique fire resistance and strength properties of the Fermacell and the excellent thermal insulation properties of Spacetherm® combine to give a versatile, robust insulated lining board.

Installation:
The Spacetherm®-F panels should be mechanically fixed using fixings appropriate to the substrate. Adhesive dabs should not be used to fix this system. The boards may be secured either to timber strapping using plasterboard screws, or directly to the base wall with hammer screws or shot fired nails at 600 centres maximum. When using hammer screws a pilot hole should be drilled through the material, and care should be taken during drilling as fibres may wrap around the drill bit. Please note the panels should always be drilled from the Fermacell side. If using shot fired fixings, it must be ensured that the gun is set to an appropriate power level for the substrate. For further advice regarding power settings, please contact your nailgun supplier.

The Spacetherm®-F laminate may be cut using a jigsaw or circular saw. The panels may also be cut using hand tools, however care should be taken when sawing by hand that the fibrous layers are not damaged. The panels should always be cut and drilled from the plasterboard side. Cut outs for windows and sockets can be made by drilling the corners of the cut out then cutting with a jigsaw. It may be necessary to trim the aerogel using a Stanley knife after making the cut out.

All joints and fixings should be filled using Fermacell joint filler. Care should be taken that filler is applied to the full depth of the joint. Once dry, this should then be sanded prior to the application of FST surface treatment.

After fixing of the panels the surface may require treatment with Fermacell Fine Surface Treatment (FST). This is supplied ready mixed and should be applied to the full surface using standard plastering tools. It is recommended that this is applied to 1-2m^2 at a time. Any excess should be immediately removed. The FST will dry in around 45 minutes, the surface is then ready for decoration.

Handling Instructions:
Spacetherm®, and in particular the dust produced while cutting and handling the material is a powerful desiccant and therefore gloves and dust masks should be worn when handling the material. Ensure the working space is well ventilated. Some power saws have vacuum extraction systems built in, and where possible, these should be used. While exposure to this dust will not cause long term harm, it may cause irritation to skin, eyes and respiratory tract.

For COSHH information and full installation instructions, please visit **www.spacetherm.com**

SPACETHERM® P (PLASTERBOARD)

The Spacetherm® P Laminate comprises of Spacetherm® insulation blanket laminated to a plywood reinforced plasterboard.

Installation

The Spacetherm® P panels should be mechanically fixed using fixings appropriate to the substrate. Adhesive dabs should not be used to fix this system. The boards may be secured either to timber strapping using plasterboard screws, or directly to the base wall with hammer screws or shot fired nails. When using hammer screws a pilot hole should be drilled through the material, and care should be taken during drilling as fibres may wrap around the drill bit. Please note the panels should always be drilled from the plasterboard side. If using shot fired fixings, it must be ensured that the gun is set to an appropriate power level for the substrate. For further advice regarding power settings, please contact your nailgun supplier.

The Spacetherm® P laminate should be cut using a jigsaw or circular saw. The panels may also be cut using hand tools, however care should be taken when sawing by hand that the fibrous layers are not damaged. The panels should always be cut and drilled from the Plasterboard side. Cut outs for windows and sockets should be made by drilling the corners of the cut out then cutting with a jigsaw. It may be necessary to trim the Spacetherm® using a Stanley knife after making the cut out.

After fixing of the panels the surface should be taped and filled as normal.

Handling Instructions.

The Spacetherm®, and in particular the dust produced while cutting and handling the material is a powerful desiccant and therefore gloves and dust masks should be worn when handling the material. Ensure the working space is well ventilated. Some power saws have vacuum extraction systems built in, and where possible, these should be used. For further information please refer to the COSHH material safety data sheet available at **www.spacetherm.com**

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