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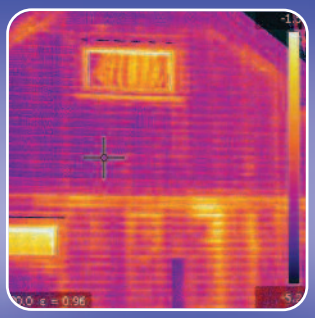

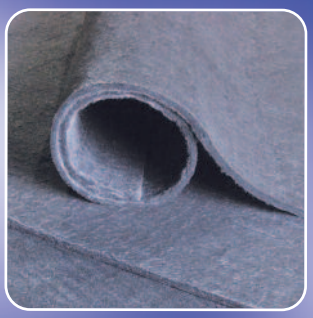

# Spaceloft


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DATA SHEET

# Spaceloft®

## HIGH PERFORMANCE INSULATION FOR BUILDING ENVELOPES

Spaceloft is a flexible, nanoporous aerogel blanket insulation designed to meet the demanding energy conservation requirements of residential and commercial building applications.

Spaceloft's unique properties – extremely low thermal conductivity, superior flexibility, compression resistance, hydrophobicity, and ease of use – make it essential for those seeking the ultimate in thermal protection.

Using patented technology, Spaceloft insulation combines a silica aerogel with reinforcing fibers to deliver industry-leading thermal performance in an easy-to-handle and environmentally friendly product. Spaceloft products are a proven, effective insulator in building applications, providing maximum energy efficiency in walls, floors, roofs, and framing.

## Advantages

**Superior Thermal Performance**
Up to five times better thermal performance than competing insulation products

**Reduced Thickness and Profile**
Equal thermal resistance at a fraction of the thickness

**Less Time and Labor to Install**
Easily cut and conformed to complex shapes, tight curvatures, and spaces with restricted access

**Physically Robust**
Soft and flexible but with excellent springback, Spaceloft® recovers its thermal performance even after compression events as high as 50 psi

**Shipping and Warehousing Savings**
Reduced material volume, high packing density, and low scrap rates can reduce logistics costs by a factor of five or more compared to rigid, preformed insulations

**Hydrophobic Yet Breathable**
Spaceloft® repels liquid water but allows vapor to pass through

**Environmentally Friendly**
Landfill disposable with no respirable fiber content

## Characteristics

Spaceloft® can be cut using conventional textile cutting tools including scissors, electric scissors, and razor knives. The material can be dusty, and it is recommended gloves, safety glasses, and dust mask be worn when handling material. See MSDS for complete health and safety information.

## Other Available Materials

Aspen Aerogels® produces several series of flexible aerogel blanket materials for thermal insulation, energy absorption, and fire protection. Please contact Aspen Aerogels® for additional information on these products.

## Product Properties and Sunstainability

| | |
|---|---|
| **Thicknesses*** | 0.2 in (5 mm)<br>0.4 in (10 mm) |
| **Width*** | 58 in (1,475 mm) |
| **Thermal Conductivity**<br>ASTM C 518 (Mean Temp. 75°F)<br>EN 12667 (Mean Temp. 10°C) | <br>0.101 BTU-in/hr-ft²-°F<br>14 mW/m-K |
| **Color** | Gray |
| **Compressive Strength**<br>ASTM C 165 | 8 psi stress at 10% compression |
| **Fire Performance**<br>ASTM E 84 | Class A |
| **Water Vapor Transmission**<br>ASTM E 96 | 33 Perms |
| **Hydrophobic** | Yes |
| **Embodied Energy** | 53 MJ/kg |
| **Embodied $CO_2$** | 4.2 kg of $CO_2$/kg |

* Nominal Values



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# Aerogel Interior Wall Insulation Reduces U-Values by 44%, Lowers Energy Use and Carbon Emissions

Aerogel solution is thin and quickly installed in UK apartment interiors

## CASE STUDY

### DETAILS

Location: UK
Fabrication Partner: The Proctor Group

### CHALLENGES

- Provide insulation for UK government program to upgrade insulation in public housing apartment units.
- The insulation needed to improve the units' U-values to save energy and reduce carbon emissions.
- The insulation also needed to be thin to minimize encroachment on living space in small rooms.
- Other requirements included water resistance, noise abatement, breathability, and easy installation.

### SOLUTIONS

- The Proctor Group developed a double layer of **Spaceloft® 9251** laminated to a building facing board.
- The insulation panel met the functional requirements with a total thickness of only 30 mm.
- Panels were easy to install, simply screwed onto the existing wall with no framing needed.

### BENEFITS

- The Spaceloft solution cost-effectively met all energy targets. (Details on back.)
- The Spaceloft solution was three times thinner than the nearest installed competitive solution due to framing requirments.
- Installation was 50% faster than the nearest competitive solution.
- Overall, Spaceloft was the best space/cost solution.

Spaceloft - High Performance Insulation for Building Envelopes

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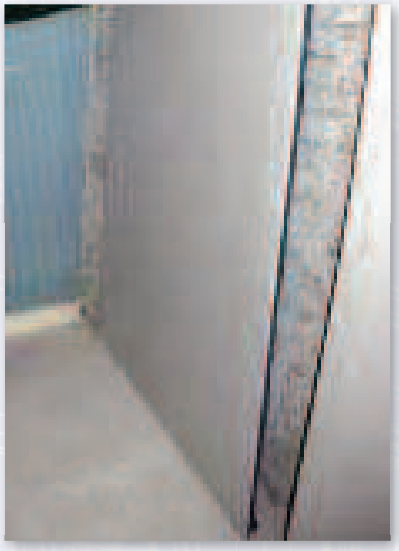
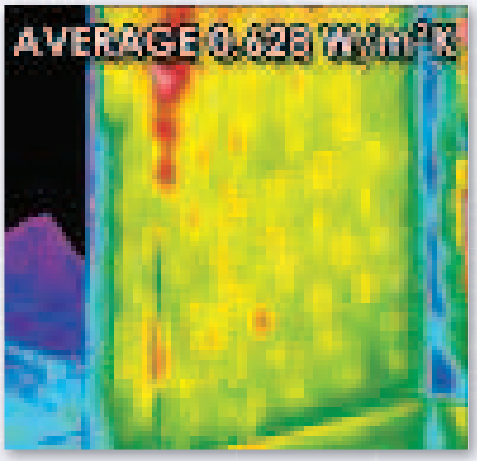
**U-Value and Energy Savings From Installation of Spaceloft® 9251***

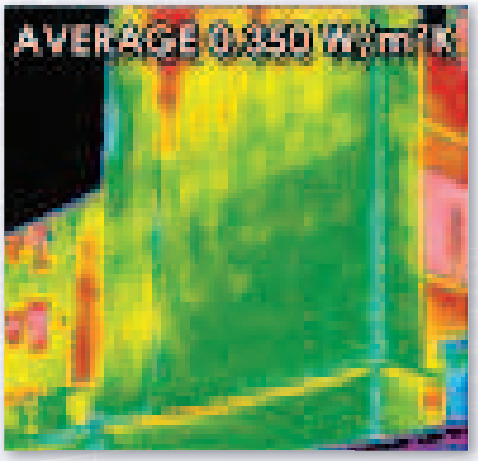
- U-value reduction: 0.28 W/m2k, (0.63 - 0.35 W/m2K), a 44% reduction
- Energy reduction: 900 kWhr/yr
- Carbon emmission reduction: 400 kg/yr

*Calculations performed using the SAP-approved software package Northgate Maxim 5.



Panels of Spaceloft® 9251 laminated to building facing board were easily attached to apartment walls and around windows and other fixtures.




The result was dramatically reduced heat loss. Infrared photos show the outside of a wall without aerogel insulation (left) losing nearly twice as much heat as the wall with aerogel insulation (right). Heat loss appears as red, orange, and yellow.

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# Aerogel Insulation Converts Old Mill House Into Modern Energy-Saving Passive House

Improves energy efficiency while conserving space and maintaining building's character features

## CASE STUDY

### DETAILS

Location: Switzerland
Fabrication/Installation Partner: AGI

### CHALLENGES

- Insulate a Swiss home built in the 1600s to achieve passive energy status – not requiring heating or cooling.
- Conserve living space.
- Use a flexible insulation to maintain the original shape and reveals of the house.

### SOLUTIONS

- An aerogel solution consisting of multiple layers of **Spaceloft® 9251** (9 mm) was used externally and internally on the walls and also internally on the floors.
- Externally – traditional rendering systems were applied with a standard metal mesh to protect the system.
- Internally – standard plaster was used to allow a breathable solution that let entrapped vapor "breathe" through the wall.

### BENEFITS

- The U-value of the walls improved from 1 W/m2K to 0.2 W/m$^2$K.
- The contractor experienced faster installation rates for the walls and floors.
- The building retained its character features.

Spaceloft - High Performance Insulation for Building Envelopes

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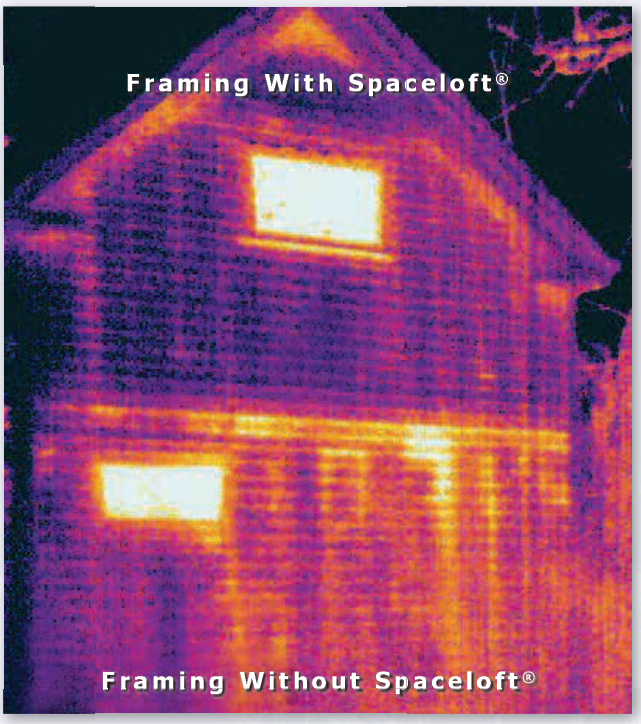
# Wood Framing Insulated With Aerogel Improves Energy Efficiency by 15%




## Economical method to eliminate thermal bridging in framing members

## CASE STUDY

### DETAILS

Location: U.S.

### CHALLENGES

- Homeowners renovating a nearly 300-year-old house wanted to increase the energy efficiency at an economical price.
- With their construction and real estate experience, the owners understood that to improve the home's energy efficiency they would have to address heat loss through the frame.
- Due to old construction techniques and materials, framing density varied throughout the house and in some cases was quite high.

### SOLUTIONS

- The homeowners selected Spaceloft® Insul-Cap to eliminate the thermal bridging through the frame members in the walls being renovated. This greatly increased the overall thermal efficiency of those walls.
- Spaceloft Insul-Cap can be installed on the interior or exterior of the framing member, depending on the construction or renovation details. In this application, the contractor opted to install the Spaceloft Insul-Cap to the inside of the framing members.

### BENEFITS

- The R-value of the walls containing Spaceloft Insul-Cap improved to R 13.9, a 15% improvement.
- In addition to greatly increasing the thermal efficiency of the house, Spaceloft Insul-Cap significantly reduced noise, producing both a more energy efficient and quieter house.
- Spaceloft Insul-Cap improved the energy efficiency of the house while meeting the homeowners' budget requirements.

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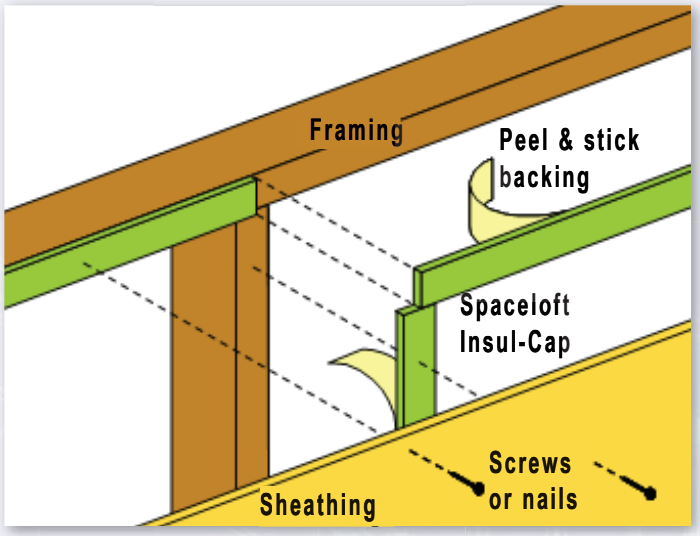
The homeowners renovated a substantial portion of their house, which was built in 1715.

The top portion of the wall below was insulated with Spaceloft® between the framing and gypsum wall board. Thermal bridging was reduced dramatically (see infrared image).

Spaceloft® is made of a ⅜" thick strip of flexible aerogel (right), the world's most efficient insulation material.

For easy installation, it comes with a peel-and-stick backing. The sheathing or siding is applied as normal, screwing or nailing right through the Spaceloft® strip. (Typical installation shown at right.)





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# Aerogel Dramatically Improves Thermal Comfort of House Floor

Flexible aerogel blanket installed in a half hour versus full day for polystyrene

## CASE STUDY

### DETAILS

Distribution Partner: Aktarus Group
Installation Partner: Gruppo Vega

### CHALLENGES

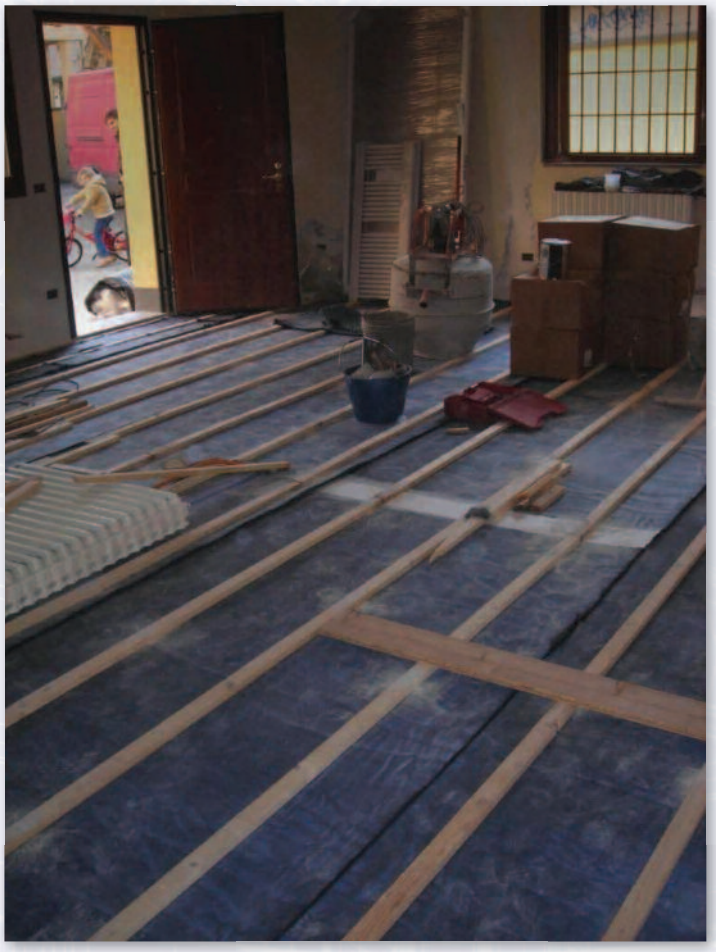
- Insulate a new floor being installed in a residential house. The existing floor had been laid down directly on the ground without any insulation.
- The new floor needed to improve the thermal comfort in the house and reduce heating costs.
- There was not much space to insulate.

### SOLUTIONS

- A solution of **Spaceloft® 9251** (9 mm) was chosen for its outstanding insulation value in a thin profile.
- The use of conventional insulation materials would have required altering or changing all doors and frames.

### BENEFITS

- Spaceloft 9251 was installed on the entire floor in 30 minutes. Polystyrene foam requires a full day. The time savings reduced labor costs and allowed the project to remain on schedule.
- The owner did not have to change any doors and frames, saving substantial time and money.
- Spaceloft is easy to unwind on the floor, flexible but robust, and easily cut like a carpet.
- The thin Spaceloft saved over 3 cm of height in the room.



It took just 30 minutes to install Spaceloft® 9251 throughout this entire room. Polystyrene foam takes a full day to install. The aerogel insulation dramatically improved the thermal comfort of the floor.

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# Aerogel Saves Space in Sea Containers Refurbished for Residential Use

## CASE STUDY

**DETAILS**

Location: UK
Customer: My Space Pod

**CHALLENGES**

- Insulate reconstituted sea containers for use as living accomodations.

**SOLUTIONS**

- Solution of **Spaceloft®** insulation for interior walls, ceiling, and floor.

**BENEFITS**

- Aerogel solution saved internal space compared to using traditional insulation materials.

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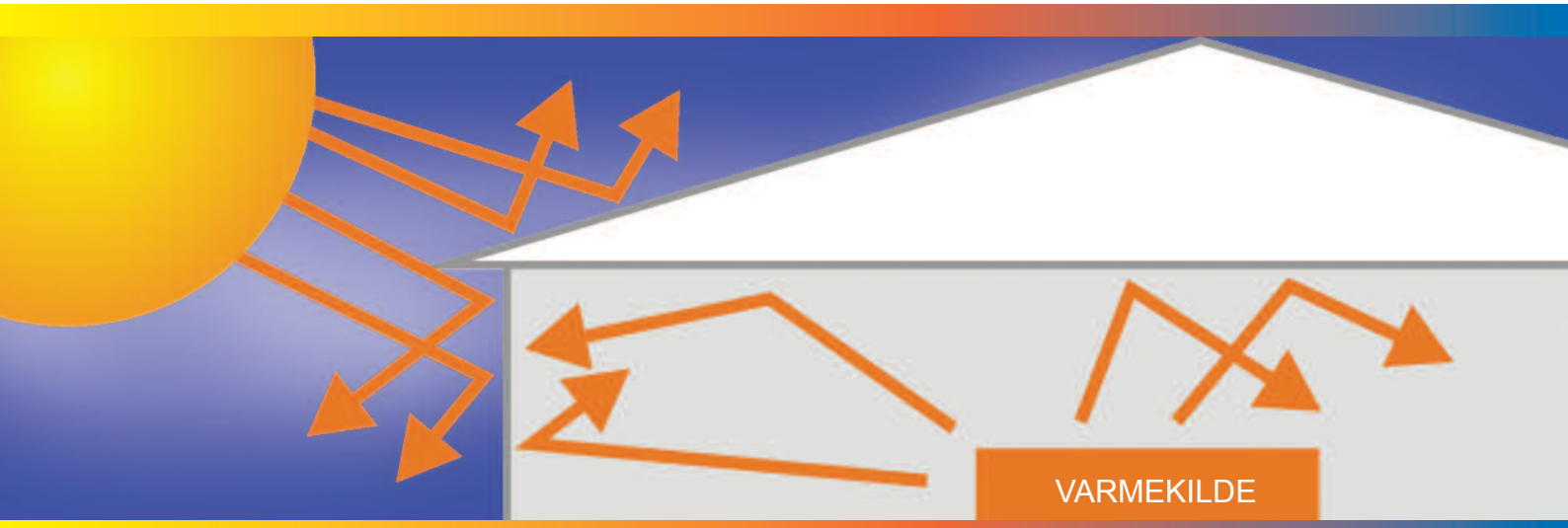


# Spaceloft

## Fordeler

**Utmerket termisk ytelse**
Opptil fem ganger bedre termisk ytelse enn konkurrerende isolasjonsprodukter

**Redusert tykkelse og profil**
Lik varmemotstand til en brøkdel av tykkelsen

**Mindre tid og arbeid å installere**
Kuttes enkelt til, kan formes etter komplekse former og tilpasses vanskelig tilgjengelige hulrom

**Fysisk robust**
Myk og fleksibel. Selv etter komprimering på 50 psi gjenoppretter Spaceloft® sin termiske ytelse.

**Frakt og lagerhold**
Redusert materialvolum, høy pakketetthet, og enkel avhending kan redusere logistikkostnader med en faktor på fem eller mer i forhold til stive, prefabrikerte isolasjonsmaterialer

**Hydrofob, likevel pustende**
Spaceloft® frastøter vann, men tillater damp å passere gjennom

**Miljøvennlig**
Kan deponeres uten respirabelt fiberinnhold