

# Rail Solutions

ADVANCED TECHNOLOGIES FOR THE INDUSTRY



# INTRODUCTION

The A. Proctor Group has, for nearly 80 years been developing and supplying product solutions to the agriculture, and building & construction industry, including a 50 year pedigree of providing thermal and acoustic product solutions. In developing Spacetherm, we have a product which provides excellent thermal properties.

## DIVERSITY INTO RAIL

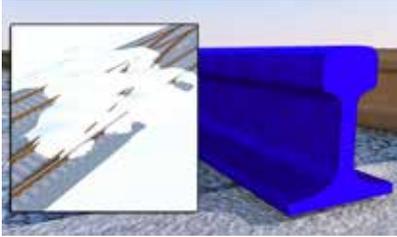
Rail Infrastructure Managers have to work through some of the harshest conditions in an attempt to keep the rail network open. This has seen innovations in many areas and points heating products have been developed, manufactured, proven and introduced into the standard products now used by infrastructure engineers.

We are proud to be providing Tracktherm® Insulating Strips to Network Rail as shown in the points upgrade shown adjacent.



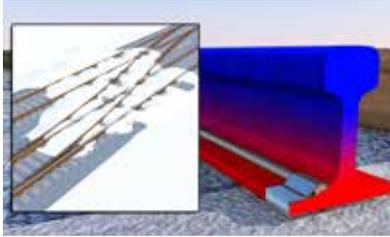
# TRACKTHERM INSULATING STRIP

RAILWAY POINTS WITH NO HEATING



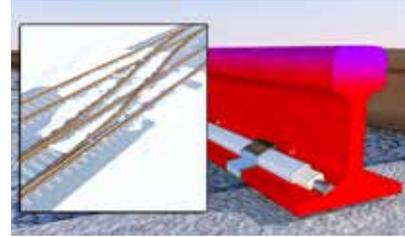
Railway points with no heating can be difficult to keep operational under challenging winter weather conditions, leading to train delays and cancellations.

RAILWAY POINTS WITH UNINSULATED HEATING STRIP



Railway points with an uninsulated heating strip are better at keeping the points operational, however much of the heat generated is lost to the open air:

RAILWAY POINTS WITH TRACKTHERM



Heating elements covered with Tracktherm insulating strips offer the best performance, directing the generated heat towards the rail.

## RAIL INNOVATIONS

In an attempt to improve the performance of rail points heating Network Rail introduced and tested products, including Tracktherm, for insulating the rail and heating electrode interface. Tracktherm performed extremely well. It is clipped into place over the rail and heating electrode and the energy from the electrode, (typically 200W/m) is dissipated quickly and effectively into the rail ensuring that the rail temperature increases above the surrounding frozen ambient temperature and as a result of these improvements, rail infrastructure managers can choose from a range of lower power rated heating electrodes to reduce the energy input where supply is limited or to save energy in these days of ongoing increases in energy supply cost. Energy consumption reduction is assumed to be 25-30%



## SPACETHERM

We pride ourselves on being the UK's most knowledgeable provider of superior aerogel-based thermal innovations. We have provided support, knowledge and solutions in markets as diverse as automotive, rail, marine and appliances, and manufacture and supply unique, engineered aerogel products for challenging applications.

The A Proctor Group's Spacetherm® Aerogel offers specifiers a flexible yet robust insulation blanket solution. Combining a silica aerogel with a fibre matrix, it is a superior material which is suitable for a wide range of challenging applications where thermal performance is crucial.

With a thermal conductivity from 0.015 W/mK, Spacetherm Aerogels are among the best insulating materials available worldwide. They are engineered by the A. Proctor Group to offer unmatched thermal performance in space critical applications. Tracktherm uses one of the higher operating temperature Aerogel products with a thermal conductivity of 0.021 W/mK.

The A. Proctor Group works closely with clients to establish requirements and deliver effective, tailored solutions.

## AEROGEL

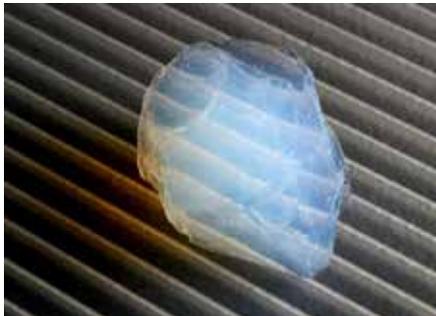
Aerogel is the world's lightest solid material; in its raw form its composition is over 90% air. A highly effective insulator, it has the lowest thermal conductivity of any solid known to man. Until 2011, silica aerogel held 15 entries in the Guinness World Records for material properties, including best insulator and lowest density solid.

Aerogel was first created by scientist Samuel Stephens Kistler in 1931, the result of a challenge with a colleague over who could replace the liquid in "jellies" with gas without causing shrinkage.

It has been widely used since its invention, for example NASA discovered that in its raw form, aerogel was capable of collecting stardust from space. This unique material's history is captivating, but perhaps even more fascinating is how it has been employed to meet the requirements in everyday applications, producing much-needed solutions to people across the globe.

The name 'aerogel' can be misleading however, as it is in fact, a dry, rigid solid. The name stems from the fact that aerogel is derived from a wet gel, the liquid component having been replaced by a gas in most cases. The result of this process is a solid with extremely low density, and crucially, very low thermal conductivity.

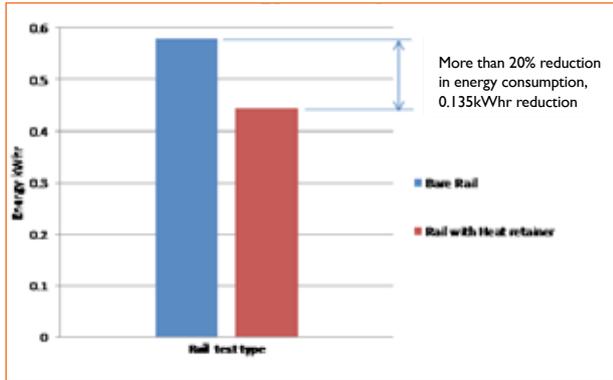
The conductive insulation properties of aerogel are unrivalled.



# TRACKTHERM PROPERTIES

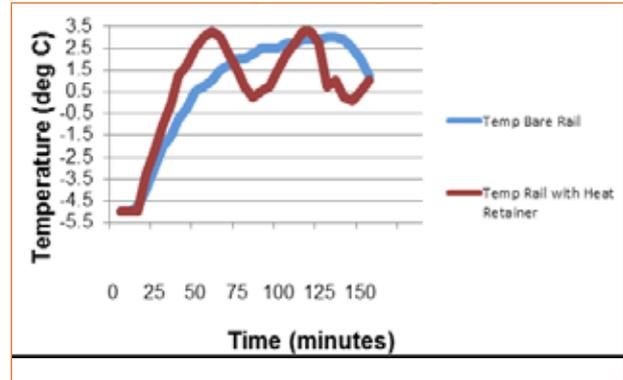
	TRACKTHERM
Thermal Conductivity (EN12667)	0.021 W/mK
Reaction to Fire (EN13501-1:2007)	Class A2 -s1, d0
Compressive Stress / Strain	11.4 psi (78.3kPa) @ 10% deflection
Specific Heat Capacity	-
Vapour Resistivity (EN12572)	37 MNs/gm
Density	200 kg/m <sup>3</sup>
Thickness	5/10mm (or multiples)
Surface Burning Characteristics (ASTM E84)	Flame spread index = 0    Smoke development index = 0
Maximum operating temperature	240°C

## FACTORY LAB TESTS



### ENERGY CONSUMPTION

A heated rail consumes energy to react to the cold temperatures. With Tracktherm the energy consumption is reduced by more than 20%. (Based on heating system operating at 200W/m).



### RAIL TEMPERATURE CYCLING TEST

With the addition of the Tracktherm Insulating Strip, heat losses from the rail are virtually eliminated and the heat flows directly into the rail as required. There is a significant improvement in the effectiveness of heating the rail points is saving energy and providing an efficient heating system.



## Case Study

# RAIL INNOVATIONS

We are proud to be providing multiple thermal innovations to Network Rail such as their latest de-icing carriage pictured above.

The A.Proctor Group were asked to develop a thermal solution that would ensure air temperature generated from the de-icing train was maintained as constant as possible before making contact with frozen tracks. Bespoke Spacetherm Aerogel sections were cut at our fabrication facility and supplied for wrapping round the ducts that carry the steam. Our simple and cost effective solution, significantly improved the performance of the unit with a minimal increase in thickness.





## AN INVITATION TO EXPLORE OUR CAPABILITIES

The A. Proctor Group's technical back-up has always been an integral part of our strategic development, with an outlook based on advanced technical solutions, rather than commodity driven.

Our dedicated technical team is focused on providing high quality advice and support to our customers all the way from drawing board to site.

Contact us today to speak to one of our technical team, who will be happy to help



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*“I believe the success of the A.Proctor Group is down to a solid foundation of innovation backed up by an excellent loyal and committed team, every one of them playing an important role in our continued success. Scotland provides us with a unique platform to launch our ideas, systems and products. I am fiercely proud of this heritage and our brand.”*

**Keira Proctor**  
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