

Flint engineering

Carbon Reducing solutions



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Director

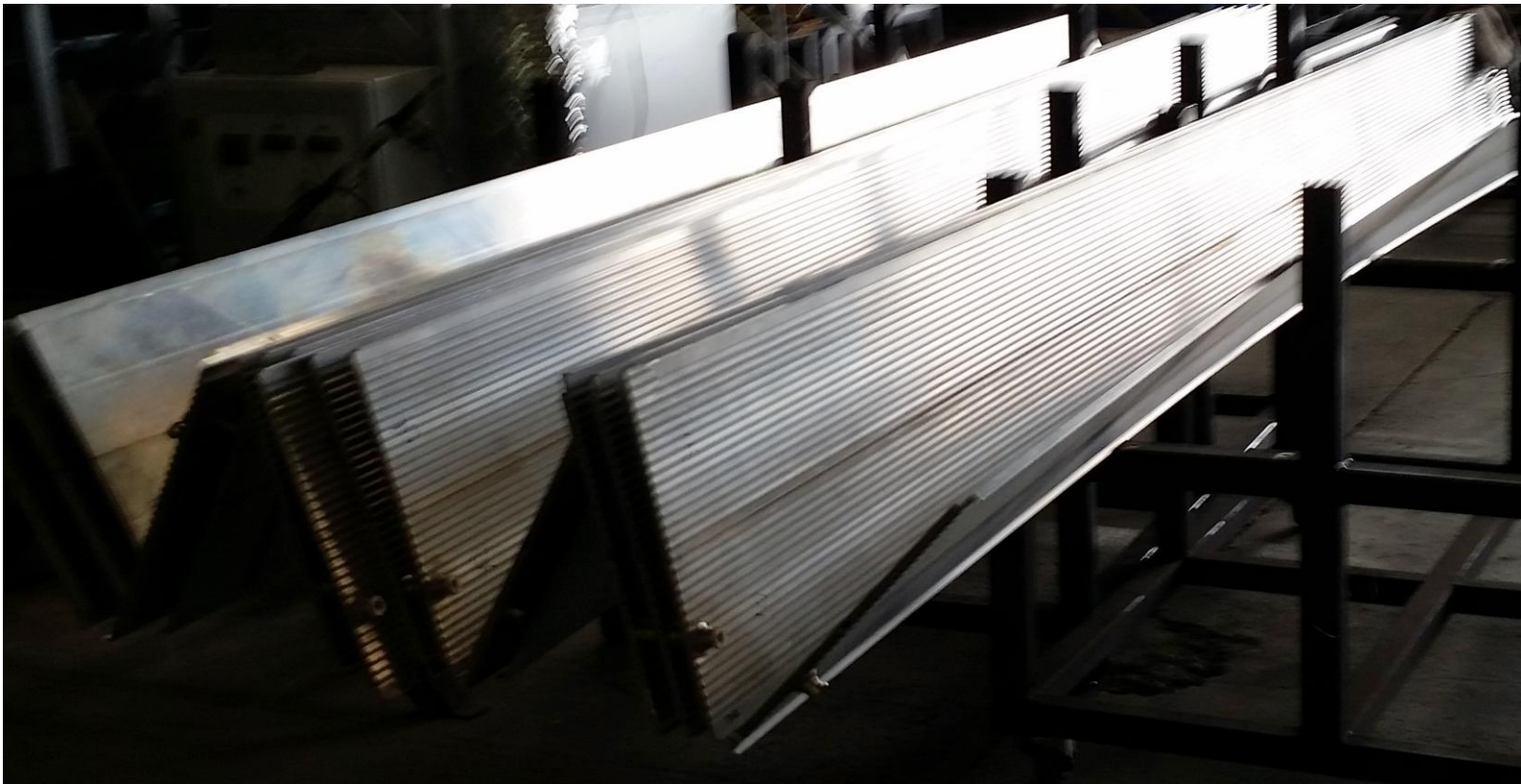
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The Heat mat

Flint Engineering holds multiple patents filed around the technology required to make the extruded heat mat™ and its applications. The heat mat is an aluminium heat pipe technology, delivering an Isothermal surface in multiple sizes up to 6m long and 2m wide. The heat mat is novel in several ways, including low cost of manufacture and very high thermal transfer properties with multiple application



Heat mat uses

The heat mat technology has potential to bring energy reduction solutions to many markets. We are currently working on:

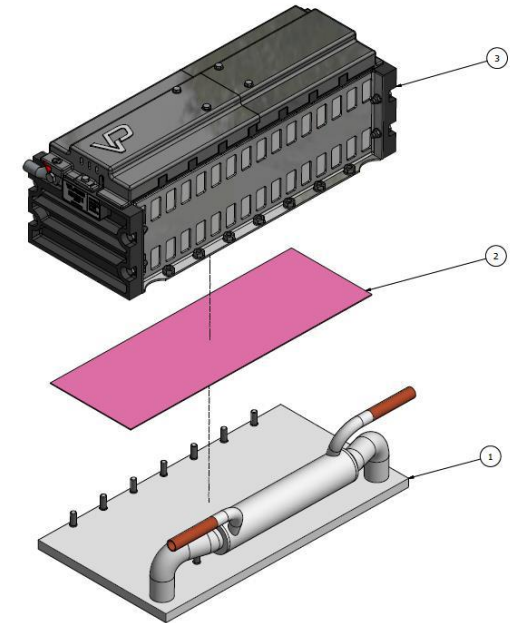
- Transport
 - Temperature stabilisation of battery packs and components
 - Cabin heating and cooling
- Refrigeration
 - Reducing the running costs of both open and closed retail fridges and freezers
- Buildings where the heat mat can become the outer skin of the building and the method for delivering the heat to the building
 - Housing both high end and social
 - Commercial buildings with a heat requirement



Automotive battery

Flint are currently part of its third Innovate UK Faraday challenge project with the objective of getting a heat mat solution to TRL8

- 1) Overheating and risk of fire when charging
 - 2) Overheating under load
 - 3) Hots spots on separate cells
 - 4) Longevity effected by temperature cycling
 - 5) Limitation of energy density
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- Test results delivering
 - Faster charging rates
 - Higher power rates
 - Closer more stable temperature control



Prototype Isothermal base cooling solution



Refrigeration shelves delivering cooling

- Supermarkets in the UK responsible for 1% of energy use and refrigeration is half of this
- The Flint shelves can cut the refrigeration load by 25% or 0.125% of the UKs total energy load
- Delivering a Return on Investment of less than 2 years
- Improve food shelf life reducing food waste.
- Cut store heating costs



Heat mat within the built environment

Challenges with current solar options

PV / Solar thermal

Aesthetics

Seasonally variable outputs

Air source heat pumps have issues

Seasonal inefficiency

Noisy

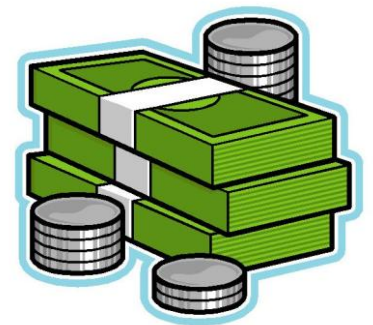
Technology mismatch

Flint is currently part of a £10m H2020 project to install Heat mat technology into 7 test installations across Europe demonstrating its viability in many applications and carbon reduction



Financial Opportunity and other markets

- 1) UK new build roofing market worth £15 billion a year excluding solar
 - 2) UK market for retro fit shelves worth up to £1 billion
 - 3) UK EV market in 2030 10 million cars on the road
 - 4) Global market over 100 times the UK
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- Other potential applications
 - Radiators for building temperature control
 - Cryogenic and medical refrigeration give stable storage and fast chilling
 - Zonal temperature control in catering and residential refrigerators
 - Low energy chest and ice-cream freezers
 - Rapid beer chilling for high output bars
 - Cold store construction
 - Server farm temperature control



What do we want and why?

- Flint is good at research and development
- We have many heat mat related Patents both granted and pending

- What we are looking for
 - Manufacturing partner
 - Sales channels
 - Green investors

Together we can take this innovative technology to market in multiple sectors. We would like to discuss working together to do this in any business model that is suitable

- Joint venture
- Licensing
- Acquisition

