Maurizio Zaglio (Sunamp Ltd)

International Business Development Manager

“Compact, high power density heat batteries”

Heat4Cool Online Training
Sunamp Highlights

- Advanced thermal energy storage
- Founded in 2005 in Edinburgh
- Subsidiaries in Switzerland, Chile, and Canada
- UK R&D, manufacturing
- Products in serial production and international sales
- >50 people directly employed
- Factory scaling up to 20’000 per year capacity
- Global Markets through partners
Sunamp Highlights

**Residential**
- UK focussed
- Retrofit and new build
- Electrification of heat and heat networks
- Distributors & resellers

**Automotive**
- Global Tier 1 automotive OEM
- Commercial vehicles e.g. rapid warm up, cold storage
- Electric range extension
- Cold, refrigerated storage

**OEM**
- Global OEM
- Global expansion
- Global and country distributors
- Global Integrated heating and cooling products

**C&I**
- Global Industrial process applications
- Global Commercial applications
- Global heat & cool networks

Heat4Cool project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 723925
Sunamp role in Heat4Cool

- Design and assembly of PCM thermal storage
- Development of key components of the technology including PCM, heat exchanger, control board and software
- Deep integration into the heat pump used in the project
- Installation and commissioning into trial sites
- Support other WPS e.g. dimensioning of system for trial sites, modelling and simulations, dissemination, etc.
What is phase change material (PCM)?

A phase change material (PCM) is a substance which absorbs / stores / releases a significant amount of thermal energy by changing phase e.g. melting/freezing, to provide useful heat/cooling.

**Hand warmer (melts at 58°C)**

**4 times better energy density**

**Sunamp SU58**

**Water**

**Energy density, Wh/L**

**Temperature, °C**
Sunamp Heat Battery – architecture

- **PCM to provide high energy storage capacity**
- **Vacuum Insulation Panels for high efficiency**
- **Power heat exchanger for high power density**
- **Electronics for control and interfacing to other systems**
- **With/without integrated heating element**
Sunamp Heat Battery – benefits

Benefits:
• Mains pressure hot water
• Rapid reheat
• High discharge flow rate
• Compact Size
• Low heat losses, ERP A+
• No Pressure & Temperature safety valve
• No risk of explosion
• Negligible legionella risk
• No discharge pipework
• Flexible Siting, lower cost and easy install
• No need to comply with G3 regs*
• No maintenance requirements

*UK regulation for unvented cylinders requiring mandatory yearly inspection
Sunamp Heat Battery – comparison with tanks

-71% in volume

Equal energy stored

<table>
<thead>
<tr>
<th>Equiv Cylinder</th>
<th>Daily heat loss</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed base (10 years old)</td>
<td>2.5 to 3.5 kWh</td>
<td>1,095 kWh</td>
</tr>
<tr>
<td>Brand new, top quality</td>
<td>1.3 kWh</td>
<td>475 kWh</td>
</tr>
<tr>
<td>Sunamp UniQ HW 9</td>
<td>0.74 kWh</td>
<td>270 kWh</td>
</tr>
</tbody>
</table>

Albin Trotter ATI E-305L

Uniq eHW 12

→ ½ →

½ in both height and depth

2,140mm

2,140mm

630mm

1,057mm

1,057mm

365mm

570mm

570mm

Sunamp UniQ HW 9

Brand new, top quality

Daily heat loss

Annual
Sunamp Heat Battery – product range

<table>
<thead>
<tr>
<th>Model Example</th>
<th>Measured kWh</th>
<th>Equivalent cylinder (L)</th>
<th>Heat Loss (kWh/24h)</th>
<th>Comments</th>
<th>ErP Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniQ HW 3</td>
<td>3.5</td>
<td>70</td>
<td>0.449</td>
<td></td>
<td>A+</td>
</tr>
<tr>
<td>UniQ Heat 6</td>
<td>7</td>
<td>140</td>
<td>0.649</td>
<td></td>
<td>A+</td>
</tr>
<tr>
<td>UniQ HW 9</td>
<td>10.5</td>
<td>210</td>
<td>0.738</td>
<td>Stackable two high for larger storage</td>
<td>A+</td>
</tr>
<tr>
<td>UniQ Dual 12</td>
<td>14</td>
<td>280</td>
<td>0.809</td>
<td></td>
<td>A+</td>
</tr>
<tr>
<td>UniQ Heat 80</td>
<td>90</td>
<td>1800</td>
<td>2.2 (provisional)</td>
<td>Palletised, 1.5 Tonnes</td>
<td>No / Non ErP</td>
</tr>
</tbody>
</table>

*height for models including stand-by electric heaters

Heat4Cool - online training - 12.05.2020

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Sunamp Heat Battery – applications

Free Heat (Air, Ground, Recycled)

Solar Energy

Grid AC Electricity

Heat Pump

Chiller/Air Con

Time-of-Use or Demand Side Management

District Heat

Cool Networks

Cool, Heat and/or Hot Water

Boiler/CHP

PV Self-Consumption

PV PVT ST

Fossil Fuel or Biomass

Heat4Cool system
Sunamp Heat Battery – Heat4Cool system

- PV
- PV – DC electricity
- Grid AC Electricity
- Deeply integrated Heat Batteries
- Additional external Heat Batteries to increase storage capacity

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