

# Sunamp

## Heat Batteries™

Sunamp Heat Batteries have many applications. In an Electric Vehicle application Sunamp's cell charges while plugged in. When driving, it discharges, demisting the windscreen and releasing instant heat for passenger comfort, without compromising range. One cell can run for 45mins on full power. Adding more cells gives easy scalability from this small EV up to large bus applications.



# Sunamp Automotive

Sunamp designs, produces and sells non-toxic, compact, highly efficient Heat Batteries that can be used to store heat for a number of applications including many renewable and low carbon technologies. Sunamp's experience in Heat Battery technology and related systems on vehicles will make significant improvements to the efficiency and sustainability of vehicles on the road.

Sunamp Heat Batteries are equipped with high power heat exchangers that can support one or multiple fluid circuits (water, glycol, oil, refrigerant, etc) for quickly charging the heat batteries and then rapidly extracting and delivering heat from them. This makes them suitable for a wide range of heat recovery, storage and re-use applications on vehicles.

## Data Sheet for Sunamp Phase Change Material – SU58

<b>Composition</b>	Sodium Acetate Trihydrate	
	Stability Additives – infinite cycle life	
	Nucleators – always freezes at 58°C	
<b>Phase Change Temperature</b>	Melt	58°C
	Freeze	58°C
<b>Maximum Temperature</b>	80°C	
<b>Density</b>	Liquid (75°C)	1.28 kg/litre
	Solid (20°C)	1.44 kg/litre
<b>Cycle lifetime</b>	No degradation – unlimited cycles	
<b>Flammability</b>	Not flammable – extinguishes flames	
<b>Viscosity</b>	< 58°C	Solid
	> 58°C	Free flowing liquid
<b>Material compatibility</b>	Aluminium, copper, stainless steel – no corrosion	
	Polypropylene – 100% compatible	
<b>Latent Heat of Melting/Freezing</b>	226 kJ/kg	289 kJ/litre
<b>Specific Heat Capacity</b>	Solid	2.8 kJ/kg/K
	Liquid	3.5 kJ/kg/K
<b>Stored energy</b>	40°C to 80°C	374 kJ/kg
		479 kJ/litre
	104 Wh/kg	133 Wh/litre

## Key Features

- ✓ 15000 cycle life proven with no degradation
- ✓ Unlimited cycle life projected
- ✓ 10 year manufacturers warranty
- ✓ 10 year capacity warranty
- ✓ In volume production now
- ✓ Proven on vehicles in road tests
- ✓ Improves vehicle efficiency
- ✓ Extends electric drive range
- ✓ Compact packaging
- ✓ Rapidly customized size, shape, capacity
- ✓ Modular – linear energy & power with cells
- ✓ Eliminates unpopular diesel heaters in EV
- ✓ Substitutes for some costly Li-Ion battery
- ✓ Excellent energy density
- ✓ Exceptional power density
- ✓ Best safety – non-flammable, non-toxic

## Data Sheet for Sunamp Heat Battery – HB58

<b>PCM</b>	SU58	
<b>Other PCM Options</b>	Heating	SU83, SU88, SU120
	Thermal Protection	SU20, SU34, SU28, SU34, SU43
	Cooling	SU5, SU8, SU10, SU12, SU15, SU20
<b>Power (per cell)</b>	Peak Discharge	>50 kW (60% glycol @-40°C, rapid heat to 50°C)
	Sustained Discharge	>7 kW (Heating cabin air via heater matrix)
	Sustained Charging	>14 kW (Cooling 80°C engine loop)
<b>Energy (HB58)</b>	40°C to 80°C	2.25 kWh per cell
<b>Internal Volume</b>	PCM	17.0 Litres
<b>Max Temperature</b>	Continuous	85°C
	Short Term	110°C
<b>Casing</b>	SU5 .. SU58 < 80°C	Polypropylene (high temperature grade)
	SU83 .. SU120 > 80°C	Metal or Engineering Plastic
<b>Recyclability</b>	Designed for easy re-manufacture / total recycle	
<b>Dimensions</b>	Height	500mm (can repackage to 430mm)
	Fully customisable Depth	463mm
	Width	115mm
<b>Automotive applications</b>	EV	Multi-year road-test on Electric Vehicle for HVAC
	Range Extension	heating – usual loss of range in winter eliminated
	ICE	Bus trial – carry-forward of waste heat from today to rapidly warm up bus next day
	Efficient Comfort	



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