Rechargeable high temperature lithium-ion battery
VL 25500-125

Cylindrical, C-sized spiral cell
Reusable up to 200 times
in demanding >100°C environments.
More than 1000 typical oil drilling surveys up to 125°C.

Saft always supplies VL cells in assemblies or as customized battery system constructions

Benefits

- More than 1 month life duration in operation: floating, pulse discharge at 125°C
- Ability to perform safely and reliably up to 125°C with severe vibration/shock constraints
- Attractive cycle life
- Easy integration within multi-cell tubular cylindrical packs
- High savings on operation costs

Key features

- Sturdy and pressure resistant stainless steel envelope
- Hermetic and corrosion-proof glass-to-metal sealing
- Redundant safety features
- Withstanding very high level of vibrations and shocks
- Non-restricted for transport/ Non-assigned to Class 9 according to the UN Recommendations on the transport of dangerous goods - Model Regulations

Main applications

- Oil drilling and all downhole high temperature environments
- Measure While Drilling *(MWD)*
- Oil and gas well monitoring
- Heat sterilizable applications

Cell size references	**R14 – C**
Electrical characteristics	
Nominal voltage (0.4 A rate at 125°C)	3.6 V
Nominal capacity *(under 0.4 A at + 125°C with 2.5 V cut-off. The capacity restored by the cell varies according to current drain, temperature and cut-off)*	2.0 Ah
Nominal energy	7.2 Wh
Cycle life (C/5 rate, between 2.5 and 4.1 V) - *(100 % DOD)* 70 % original capacity still restored after: *(Cycle life depends on the using conditions, consult Saft)*	 30 cycles at 125°C 45 cycles at 115°C 300 cycles at 80°C
Cycle life with partial DOD (C/5 rate, below 4 V) - *(25 % DOD)* 70 % original capacity still restored after:	 200 cycles at 125°C
Physical characteristics (unsleeved cells)	
Diameter (max)	24.34 mm (0.958 in)
Height (max)	49.2 mm (1.937 in)
Typical weight	58.9 g (2.08 oz)
Lithium equivalent content	approx. 0.6 g
Operating conditions	
Charge method	Constant Current/Constant Voltage
Maximum charge voltage Recommended charge voltage range at 125°C	4.10 +/– 0.05 V 3.8 V to 4.0 V
Maximum recommended charge current	0.5 A (C/4 rate) at 20°C to 125°C
Charge temperature range	0/125°C
Maximum continuous discharge current	1 A (C/2 rate)
Pulse discharge current	up to 1.5 A for 2 seconds
Discharge temperature range	0/125°C

Consult Saft for available and customized battery packs

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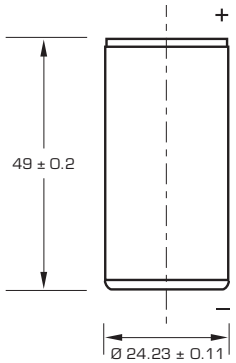
Battery assembly

In order to operate properly, individual Li-ion cells are mechanically and electrically integrated in battery assemblies specific to each application. The battery assembly incorporates electronics for performance, thermal and safety management.



Dimensions in mm.

Shocks and vibrations

- Ability to withstand in the entire operating temperature range 750 G peak/0.5 msec repetitive shocks on axial and radial axes *(undischarged and partially discharged cells)*
- Ability to withstand in the entire operating temperature range 20 G_{RMS} random vibrations 2 to 4 hours along X, Y and Z axis

< 30 Hz	@	≥ 6 dB/octave
30-80 Hz	@	3 dB/octave
80-300 Hz	@	0 dB/octave
300-1000 Hz	@	-3 dB/octave

- Ability to withstand in the entire operating temperature range 1 hour of linear sine sweep at 30 G peak, from 30 to 2000 Hz along X, Y and Z axis

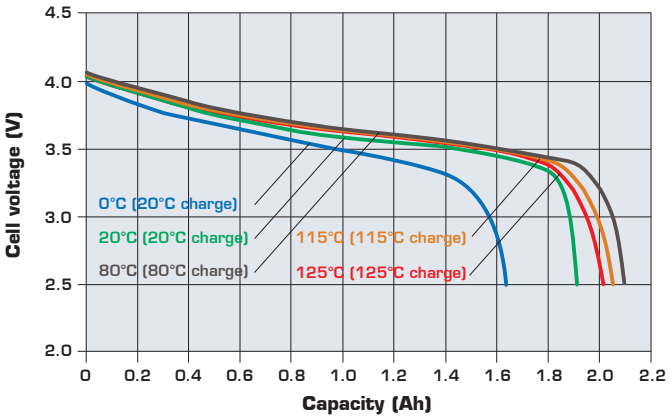
Storage

- It is recommended to maintain the storage area clean, ventilated and preferably not exceeding 30°C

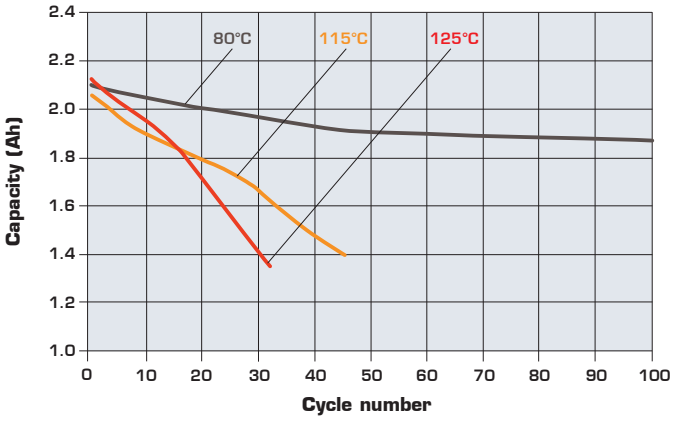
Warning

- Fire, explosion and burn hazard
- Do not short circuit, crush, disassemble, heat above 140°C *(284°F)*, incinerate, or expose contents to water

Typical discharge curve under C/5 rate (400 mA)

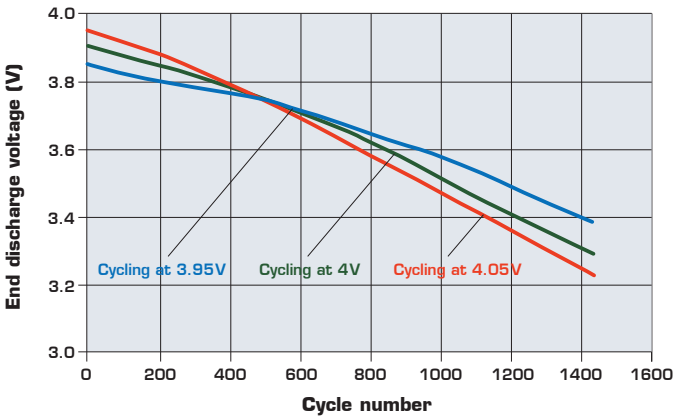


Restored capacities during cycling 2.5/4.1 V versus temperature



Down-hole mission profile: end discharge voltage versus cycle number

20 min charge at 3.95 V / 4.00 V / 4.05 V following discharge (250 mA / 10.5 s + 1.25 A / 1.5 s) during 6 min + 250 mA during 2 min



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