

Comparison Lead Acid Battery vs. GREENROCK

Advantages GREENROCK:

- ✓ Safe to touch
- ✓ Non-flammable
- ✓ Non-toxic
- ✓ Non-explosive
- ✓ 100% dischargeable
- ✓ **Absolutely maintenance free**
- ✓ Overcharging not possible
- ✓ Safety against vandalism
- ✓ Temperature range **-5°C to +40°C** in 24h average
- ✓ Longer system life in deep discharge and partial state of charge
- ✓ Environmentally friendly salt water-based electrolyte
- ✓ No construction regulations for building a battery room
- ✓ Transportation with normal means of transport – no ADR


	Tubular Gel Lead Acid	GREENROCK
Total life in years*	5,4	21,9
Investment per kWh	€ 150,--	€ 400,--
Effective useable storage DOD	50%	100%
Effective costs per kWh**	€ 0,15	€ 0,08
Comparison effective costs in %		45% advantage
Costs per year per kWh***	€ 55,55	€ 18,26
Comparison cost per year in %		67% advantage

Table 1

* total cycles as in table 3 and 4/365 – for GREENROCK we assume an average of daily charging levels between 25% and 100%.

**total energy throughput per kWh (= total cycles see table 3 and 4 x DOD%) in reference to the price.

***effective costs per 1 useable kWh/total life in years (table 1)

characteristics	Lead Acid Battery	GREENROCK
Recommended temperature range for optimal life	25°C to 30°	-5°C to 40°C in 24h average
Maintenance	Frequent terminal cleaning maintenance cycling	Free of maintenance
System redundancy at 48V	No redundancy – single cell failure can bring system to open circuit	Batteries are nominal 48V deliver system redundancy – no single failure can bring string to open circuit
Safety	Toxic materials Flammable Outgasing 	No toxic materials Non-flammable Non-explosive Environmentally friendly

GREENROCK

THE SALTWATER ENERGY STORAGE SYSTEM


characteristics	Lead Acid Battery	GREENROCK
Weight and size	50 - 80kg per useable kWh	60kg per kWh
	side by side comparison of gel lead acid (grey) and GREENROCK Black (22kWh)	
Degree of Discharge (DOD)	Max. 50% DOD – 2.000 cycles	100% DOD – 3.000 cycles 50% DOD – 5.000 cycles

Table 2

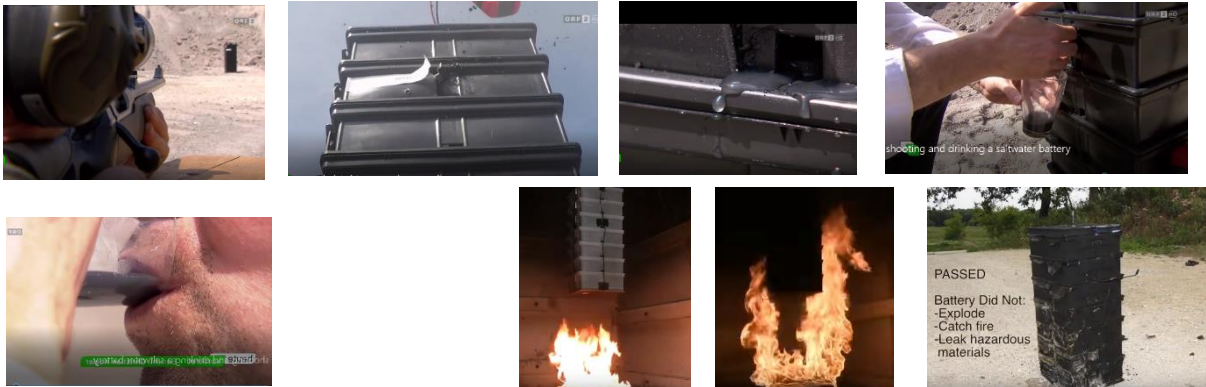
Capacity GREENROCK	cycles	kWh/ Unit	nominal storage kWh	capacity	Capacity kWh	efficiency	Effective efficiency kWh
DOD 100%	3.000	2,2	6.600	85%	5.610	90%	5.049
DOD 60%	2.000	2,2	4.400	60%	2.640	90%	2.376
DOD 45%	1.000	2,2	2.200	45%	990	90%	891
DOD 35%	1.000	2,2	2.200	35%	770	90%	693
DOD 25%	1.000	2,2	2.200	25%	550	90%	495
Total	8.000				10.560		9.504

Table 3

Capacity Tubular Gel Lead Acid	cycles	kWh/ Unit	nominal storage kWh	capacity	Capacity kWh	efficiency	Effective efficiency kWh
	2.000	1,146	2.865	50%	1.146	90%	1.031,4
Total	2.000				1.146		1.031,4

Table 4

Pictures: shooting at a saltwater battery and drinking the electrolyte plus fire test



powered by:



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