



**The test report**  
**of**  
**WN-36AH battery pack**



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**GWL  
POWER**

<http://www.ev-power.eu>

# The purpose of the test report is to show the specification of the LiFePO<sub>4</sub> battery made of WN-36AH cells.

## The advantages of the WN-36AH cells

- professionally produced LiFePO<sub>4</sub> cells
- stability during high current discharge
- the discharge with long flat discharge area (3.30V to 3.10V)
- aluminum case for protecting the cell
- no overheating or heat release during operation

## The specifications of the 12V LiFePO<sub>4</sub> battery pack made of 4 pieces WN-36AH cells

The size of the 12V LiFePO<sub>4</sub> battery pack is 150 x 130 mm with height 170 mm above the terminals. The metric volume of the battery is **3.315 dm<sup>3</sup> (liters)**.

This is **much smaller** than the size of 12V/40AH SLA battery used in the electric scooters or some other equipment where the maintenance-free batteries are used.

## Comparison between 12V/40AH SLA\*) battery and the LifePO<sub>4</sub> pack made of 4 pieces of WN-36AH cells



4.31 dm<sup>3</sup> (liters)

3.315 dm<sup>3</sup> (liters)

\* Note: SLA stands for Sealed Lead Acid battery

## More photos of the comparison between the SLA battery and the LiFePO4 battery



The metric volume of the SLA 12V/40AH battery is 4.31 dm<sup>3</sup> (liters) this is 130% of the volume of the 12V LiFePO4 battery made with 4 pieces WN-36AH cells. **The LiFePO4 is about 26% smaller!**

The battery made of 4 pieces WN-36AH cells can easily **replace the SLA 12V/40A battery.**



The 4 pieces WN-36AH cells can also simply **replace the 12V starting battery** in a conventional car.



**The weight of the 12V LiFePO4 battery pack made of 4 pieces WN-36AH cells**

The weight of the 12V/40A SLA battery is 11.680 kg.





The weight of the 4 pieces WN-36AH cells is 5.400 kg



The weight of the 12V battery made of WN-36AH is 46% of the SLA battery.

This means you save more than 50% of weight with the LiFePO4.

**Which do you prefer?  
1 kg of LiFePO4 or 2 kg of lead-acid?**

**Do you know the dangers of using the toxic lead acid batteries?**

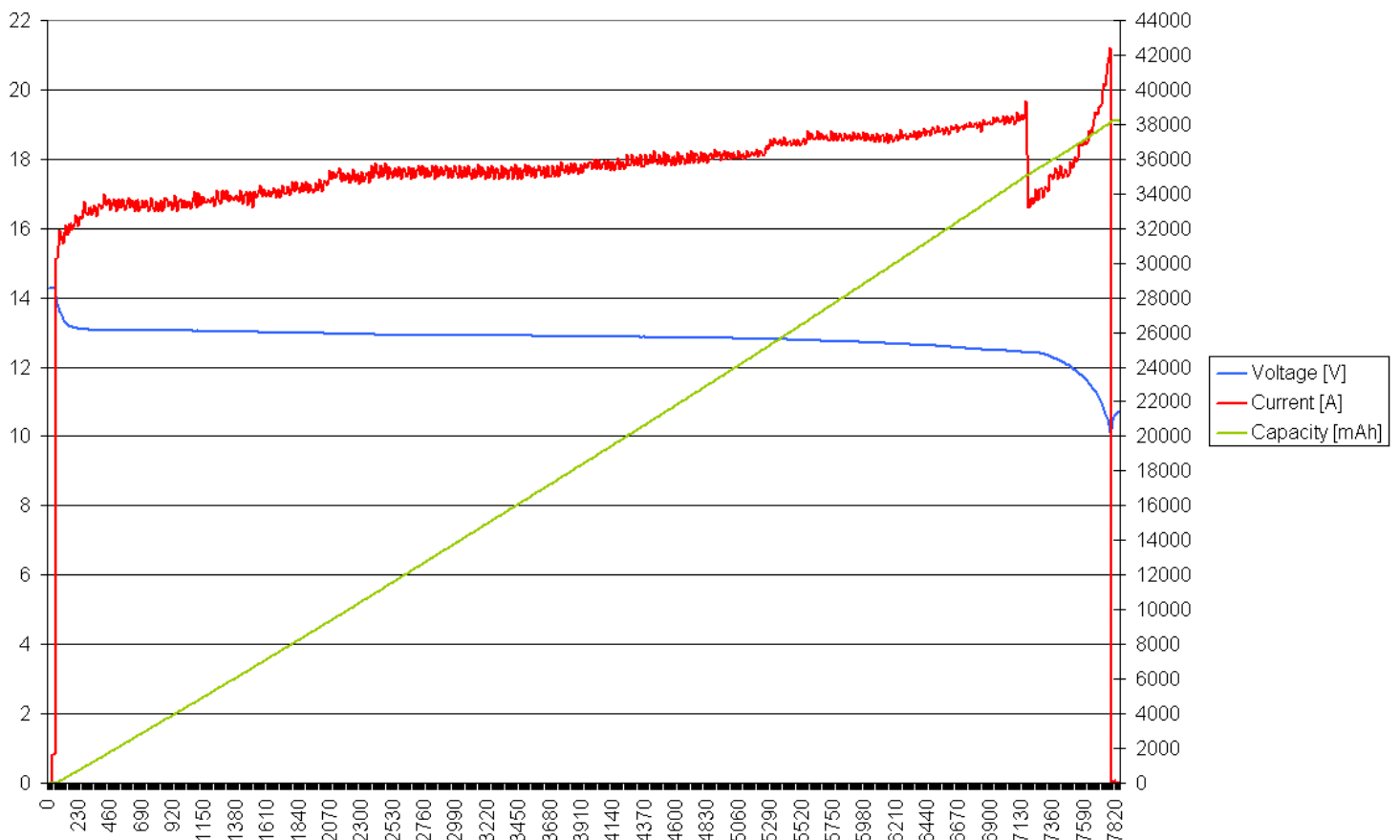


## The testing setup for continuous discharge of 4 pieces WN-36AH



The battery is connected to 12V UPS that produces 230VAC from the 12V DC battery pack. The AC load is made using one 100W and one 60W ordinary bulb. The load of the bulbs is 160W at 230V. The input power of the UPS is 12V and 16Amp to 20Amp.

## The discharge diagram of the 4 pieces WN-36AH



## The results of the discharge for the 4 pieces WN-36AH

The measured capacity of the 4 cells in series: 38.0 Ah ( 105% of the nominal value 36AH)  
The average voltage under load: 13.0 V  
The average discharge current: 17 Amp  
The running time of the UPS 7800 second (130 minutes)

## The discharge diagram for the 12V/40AH SLA battery



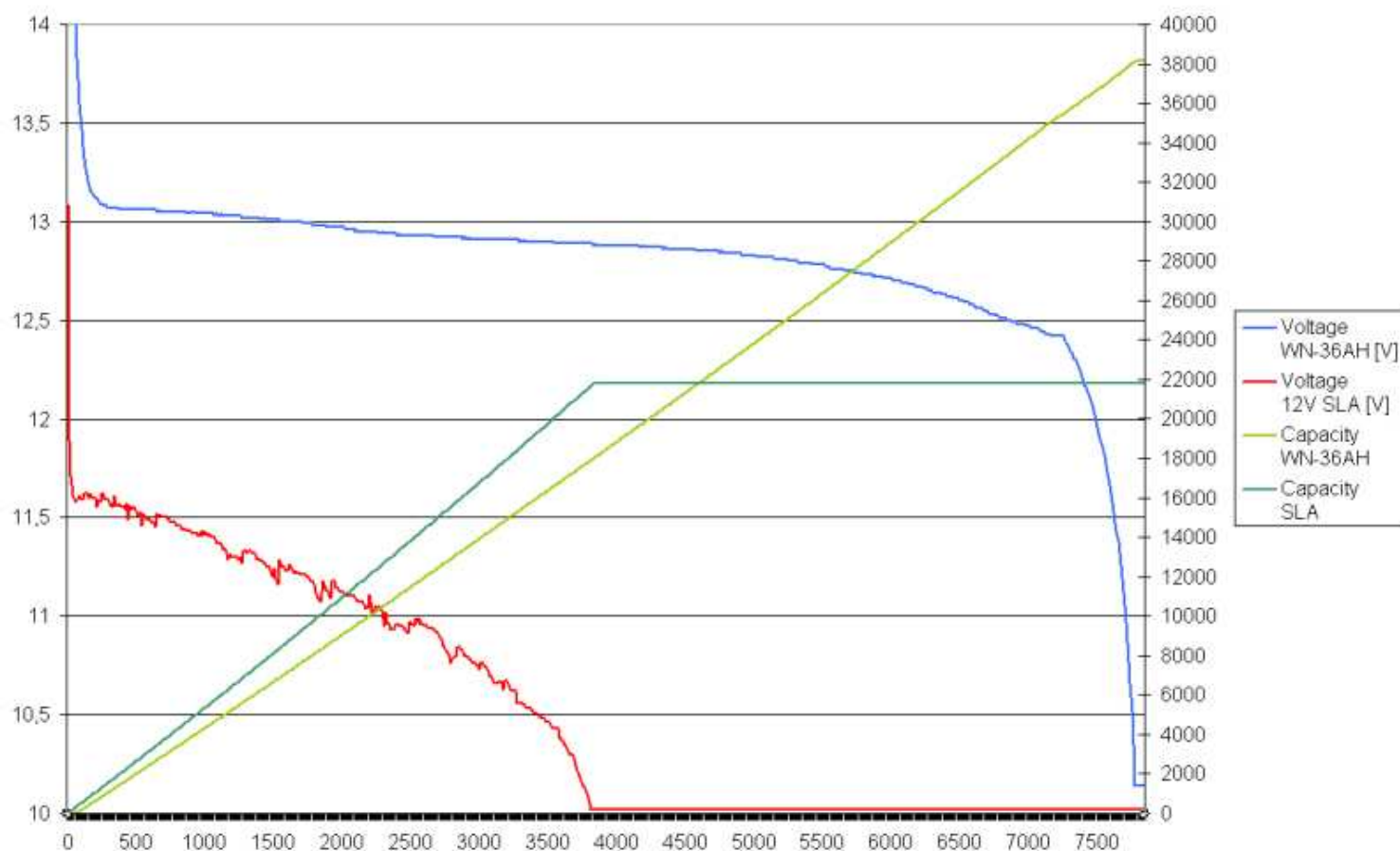
## The results of the discharge for the 12V/40AH SLA battery

The measured capacity of the 4 cells in series: 22.0 Ah ( 55% of the nominal value 40AH)  
The average voltage under load: 11.0 V  
The average discharge current: 21 Amp  
The running time of the UPS 3840 second (64 minutes)

## Conclusion of the comparisons

- The real capacity of the SLA battery is only 50% of the nominal value. The capacity of the LiFePO4 battery is 105% of the nominal value.
- The discharge time of the SLA battery is only 64 minutes; the discharge time of the LiFePO4 is 130 minutes.
- Because the voltage of the SLA battery is lower, the current must be higher to provide the same power. For the LiFePO4 battery the voltage is higher and thus the discharge current is lower.

## The comparison of the test results of the 12V SLA battery versus the LiFePO4 battery



The 12V SLA battery is losing the voltage very fast and the performance is poor.

The LiFePO4 battery is keeping the voltage and gives 100% performance.

### The summary of the test results

SLA Battery	12V 40AH
Volume (dm <sup>3</sup> )	4.31
Weight (kg)	11.68
Real capacity (Ah)	22
Discharge time (minutes)	64

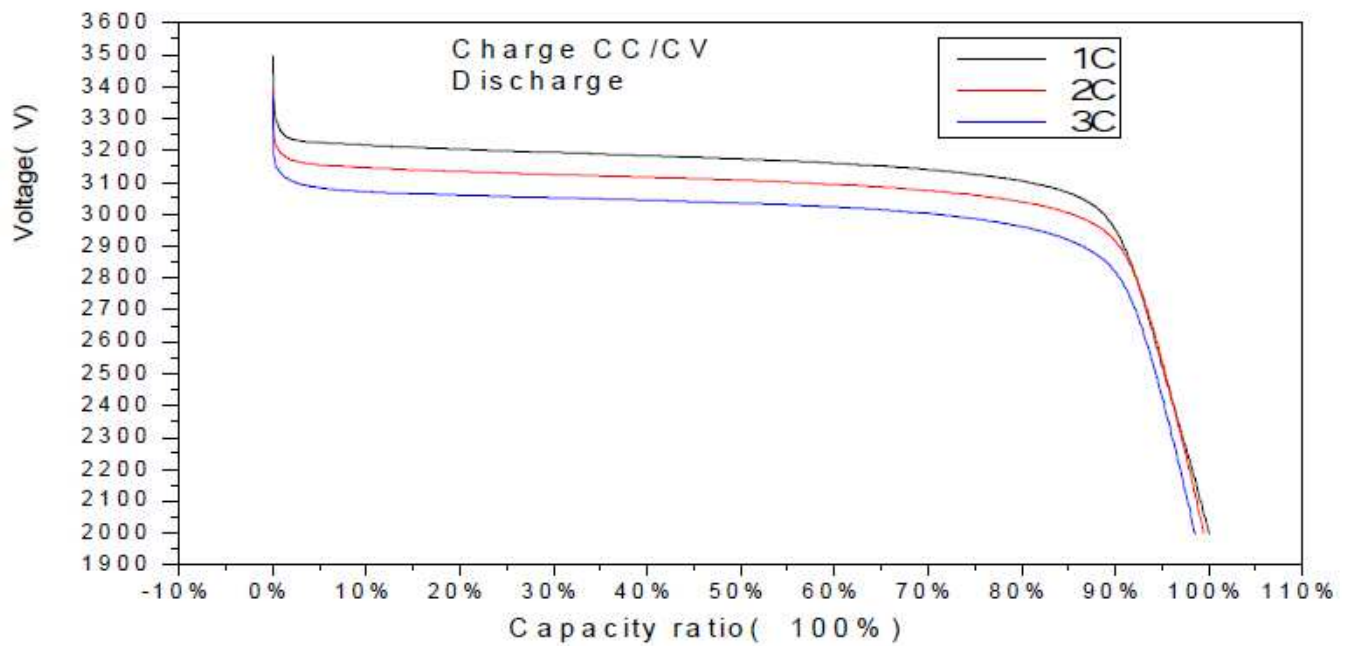
LiFePO4	12V 36AH
Volume (dm <sup>3</sup> )	3.315
Weight (kg)	5.40
Real capacity (Ah)	38
Discharge time (minutes)	130

The performance of the LiFePO4 battery is over-reaching the SLA battery in all respects.

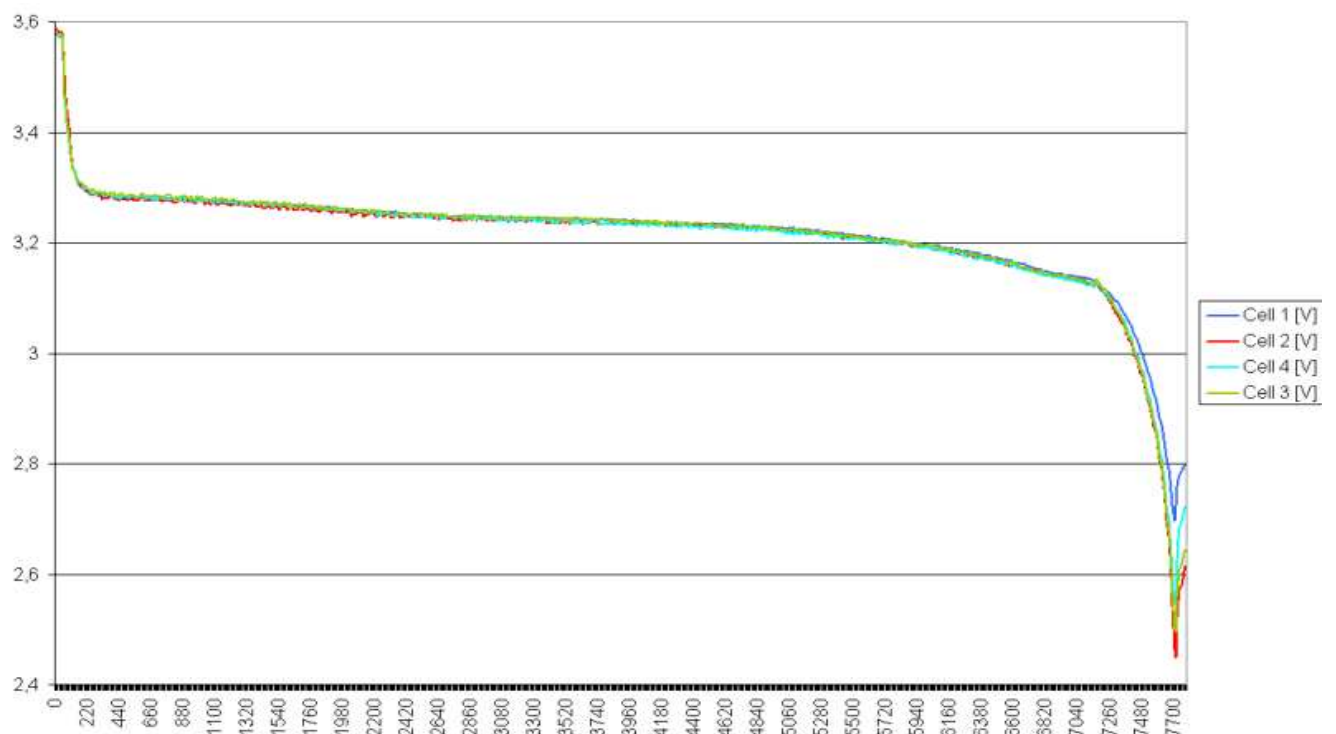


## Additional data for the WN-36AH LiFePO4 cell

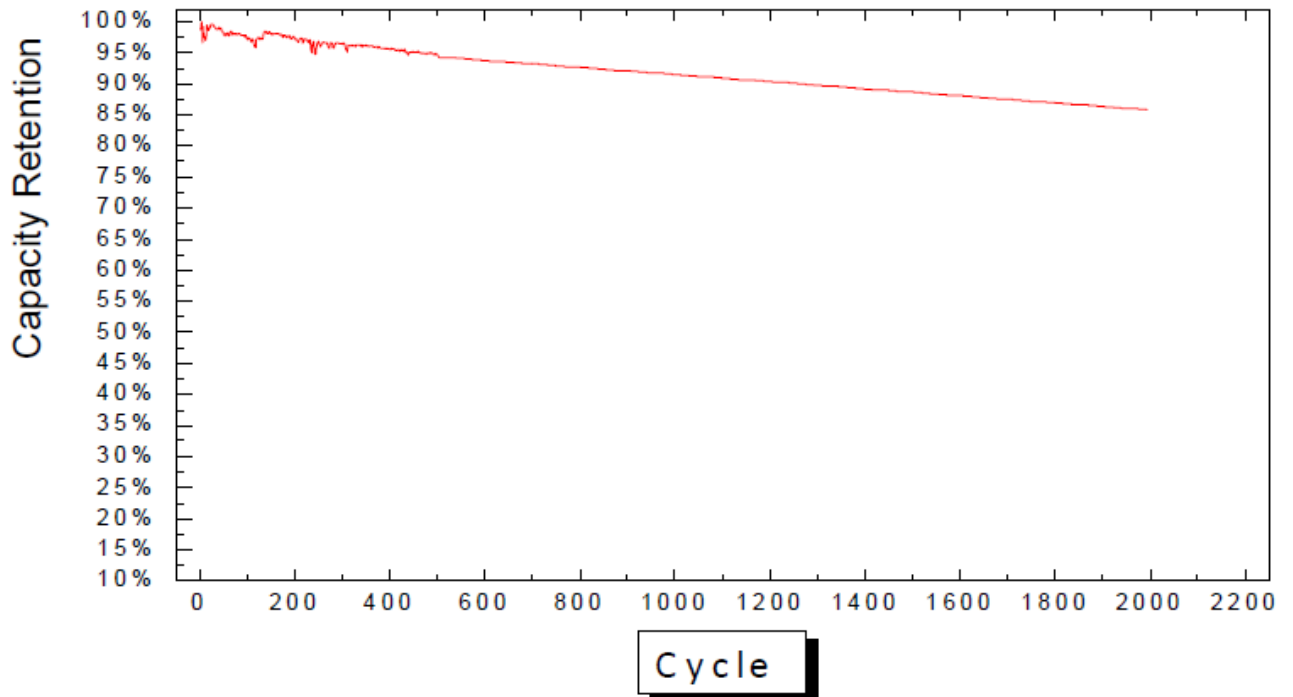
- The discharge diagram for the 1C, 2C and 3C loads



- The discharge diagram for 0.5 C (18A), as measured during the test



- The cycle life of the WN-36AH is 2000+ cycles



**Is there any reason to keep using the SLA batteries?**

**The high quality LiFePO4 cells are waiting for you!**



<http://www.ev-power.eu>

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