

- Banner
- Biltema
- Bosch
- Energie
- Exide Classic
- Exide Ultra
- Faam
- Fiamm
- Hankook
- Hoppecke
- Optima
- Rocket
- Salama
- Solite
- Trane
- Trane Calcium
- Varta
- Zap



In our previous battery test (TM 18/99) we were comparing smaller batteries of 55 Ah but this time we wanted to compare slightly bigger ones. Our aim was to collect a group of 74 Ah batteries for the comparison but unfortunately not all the manufacturers had this kind of a battery. So we had to accept a bit of variation in the capacity of the batteries but in the end the biggest variation between different batteries is only 5 Ah. This means that the batteries are very comparable.

Käynnistysen

70-75 Ah batteries are usually used as the power supply for upper middle class benzine motors and smaller diesel motors. This size is very common in the newer cars and even on the equipment market it is one most sold ones. In all there were 18 batteries which represented 16 different manufacturers. Exide and Trane both had two different models which differed from each other structurally. Every other brand had a one model in the comparison. For the measurements we acquired two pieces of every battery model. Quality of the batteries was solved by using four different tests. Two of these tests compare how a fully loaded battery gives the car an opportunity to start in a very low temperature. The third test illustrates the battery's ability to charge up between starts. Fourth test tells us what is the remaining driving distance if the battery's belt snaps and the charging of the battery stops completely.

Cold start voltage and start time

In the beginning of the cold start measurements the batteries were woken up to action by giving them a few discharge and charge cycles. This procedure put the batteries on the same line though some battery might have had a bit longer storage time than other. Cold start tests were performed in -20 degree C temperature in which the batteries were kept for 36 hours before beginning the test. Cold start test depicts very well the first start of the Monday morning if the car has been left outside after a trip to the store on Saturday and has not been used on Sunday because it's been so cold. A cold battery was loaded with 200-ampere voltage 15 seconds at a time and after each load there was a pause of 15 seconds. There were three of these load/rest cycles and after these the batteries were loaded continuously until the pole voltage dropped under 7.5 volts.

7.5 volts was selected as the limit because if the voltage is this low the cars usually don't have enough voltage for the functioning of the ignition and liquid fuel devices. If this is the case the cars don't have a chance of starting up. Measurement cycle in question can be thought of as follows: 1) The voltage of the first load period tells us what kind of a voltage the battery gives for the first attempt of the morning to start the car 2) The final load period to 7.5 volts depicts how long the battery is able to give starting energy if for some reason the car doesn't start on the first try. From the batteries we tested this time the Optima one clearly had the best cold start properties. It was the only battery to get a grade 10 (on a scale 1-10) from both tests. Closest follow up was Exide Ultra which received grade 9 from both tests. Next up as an equal group were Fiamm, Hoppecke, Trane Calcium and Varta. Other batteries didn't do quite so good in one of the tests or in both of the tests. These two tests depict the scenario where the battery is fully loaded and the car is left outside in a very low temperature for some time. Unfortunately this isn't quite the case. Short driving distances and the use of different electricity consuming devices can lead into the battery being always undercharged. Being undercharged is a big problem especially for batteries that have problems receiving power. Poor ability to receive power is emphasized when the battery is cold. When this is the case the power the battery receives might be only a fraction of what the battery can receive when it's warm outside.

Charging up in cold

Most of the drivers only drive short distances during the day in city traffic. In the morning a cold start and after that a short drive to work. In the afternoon it's the same situation driving back home. The car owner might also have used a fuel powered pre-heater to warm up the car motor and inside both in the morning and the afternoon.





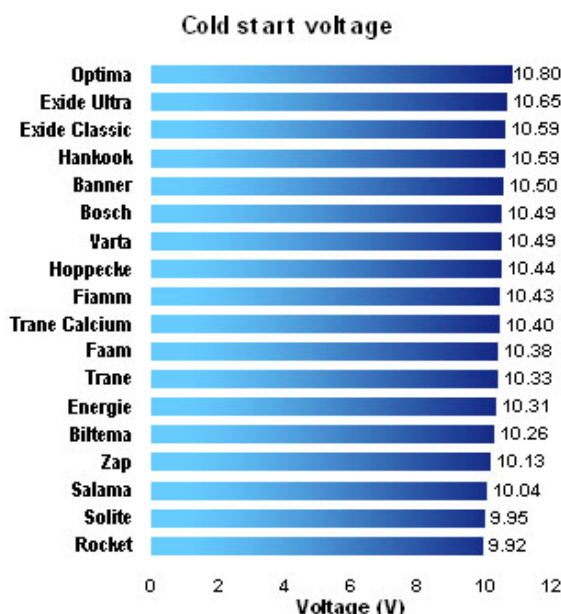
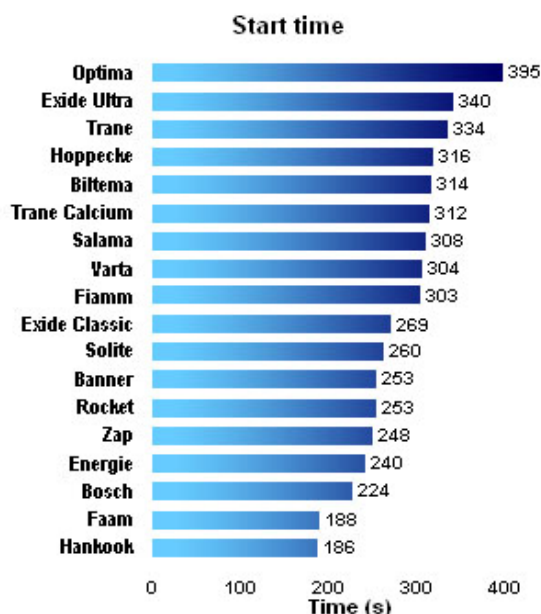
This pre-heating device adds up to comfort but every time it's used it also uses a few amperehours worth of power. Only the power used to warm up the motor can be gained back by driving 10 minutes but when the inside of the car is being warmed up the car's own heating device is used. That can consume a lot of energy and the charging condition of the battery starts to weaken. Some morning the battery might be so empty that it won't be able to start the motor up. Batteries' ability to survive short driving distances in the city was estimated by measuring their ability to receive power in a low temperature. In the beginning of the test the batteries were kept in room temperature fully loaded.

In this temperature they were charged so that they gave up 30 Ah worth of power. After this the batteries were put in -20 degree C for 24 hours. Now that we were sure the batteries were cold enough they were loaded up with a 14.4 volts voltage for ten minutes. In the same time we measured how many ampere hours each battery could receive. From this amount of ampere hours we got our grades for how good the batteries are in charging up in low temperature.

The results in this test differed a lot from those in the cold start tests. Different aspects have been emphasized in the structures of different batteries. Some batteries that are good in giving energy don't seem to be taking it in so good. With some batteries this was quite the opposite. In our comparison there were also a few batteries which were good in both giving and taking in energy in low temperature. Especially Trane Calcium stood out with its ability to charge up. The amount of energy it took in was three times more than Solite which was the worst battery in this third test.

Spare capacity

Spare capacity tells us how long the battery is able to give energy if it isn't charged. This kind of situation can happen if the battery's belt snaps when driving and then the car would have to be driven to a service center where the belt is replaced. Spare capacity and also the time start is greatly affected by the real capacity of the battery which means the amount of ampere hours in the battery. In this sense the batteries of lower capacity are in a bit different situation compared to batteries of higher capacity. On the other hand, we as drivers are only interested in how long the battery is able to give energy after the belt has snapped. If the car leaves us on road it doesn't really help the driver to know that the manufacturer didn't a 74 Ah battery in its selection. Measuring was done by adapting SAE-norm so that the batteries were discharged with 25-ampere voltage until the voltage had dropped to 9.5 volts. This discharge time was measured which gave the grade for spare capacity test. 74Ah batteries were on the top of this test as was expected. On the other hand 70Ah Hoppecke also got a good grade. This shows that the spare capacity and the real capacity of the battery don't always go hand in hand but it can also be affected with structural properties of the battery. The following batteries got full grades in this test: Exide Ultra, Fiamm, Salama and Solite. None of the batteries received really poor grade so there is a good chance of surviving to a service center after the belt snaps.





Diverse equipment

The final grades are based on the four tests. Besides those tests we were eager to examine the batteries' equipment like carrying handles but these didn't affect the grades. In newer cars the batteries are hidden so well under different protective layers that most of us don't have to touch the battery unless it is an emergency situation like when the battery is not functioning. Even good carrying handles won't make you feel good if you have to dig the battery from inside the motor when it's -20 degree C. It's a different situation if the battery is used in for example a boat, trailer or at a summer cottage as a power supply. In situations like that you can really appreciate the battery being light and easy to carry around. These kinds of leisure time batteries usually emphasize different properties of batteries than the batteries meant to be used in cars. In this comparison we emphasized only the kind of properties which prevent us from lifting up batteries. Even good equipment didn't give any extra points.

High winners and equal middle-class

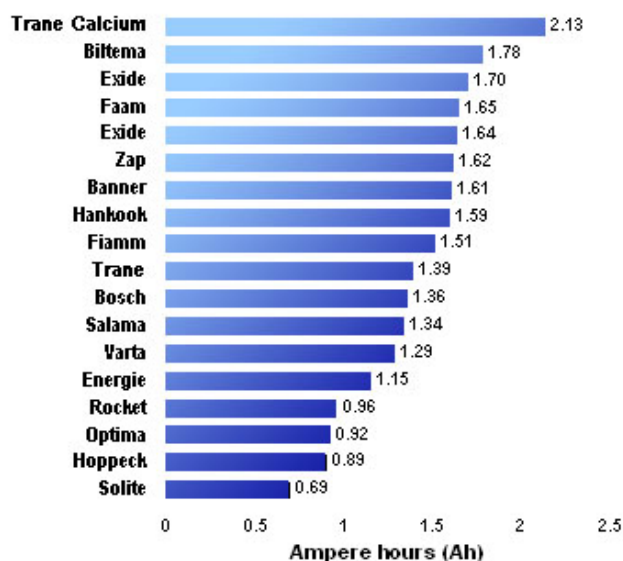
Winner of the comparison was found with a small but very clear gap to the others. Exide Ultra was equally good in all the tests and didn't receive worse than grade 9 from any of the tests. And when the spare capacity test gave 10 the average score was above 9. Also Trane Calcium was able to reach an average score of 9. Apart from these two batteries Fiamm and Optima receive full five stars.

Behind the top there usually comes the even middle class. That was also the case this time. There were 7 batteries that were given four stars. After that the stars steadily kept dropping but even the last battery of the test, Rocket, got one star. There would have been more stars but the cold start voltage was the worst of the whole comparison and that dropped the average score drastically.

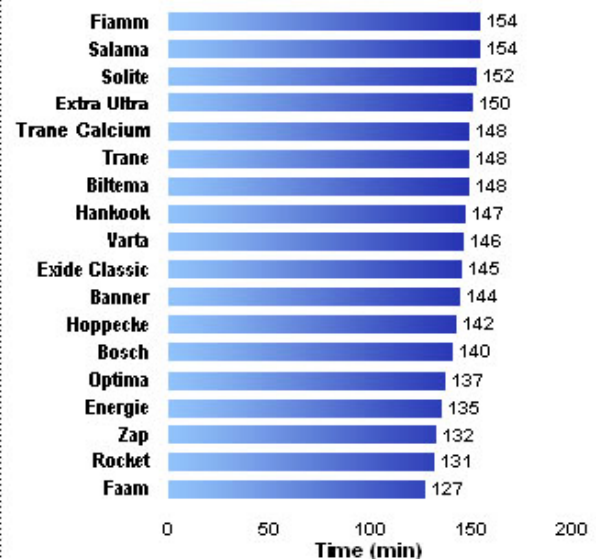
All in all we can say that there are still big differences between batteries. Some are good in giving energy but lack in the ability to take in energy when the battery is cold. With a different kind of structure the battery can be made to receive energy well but the ability to give energy is poor.

In this comparison, as in the low temperatures of the winter, best grades were received by batteries which had the both domains balanced. Choosing this kind a battery you don't have to be worried about winter. If other aspects of the car are in good shape, starting up the car should go smoothly even if it's very cold.

Ability to take in energy while cold



Spare capacity





Warning

Battery contains sulphuric acid which is very corrosive. If you get acid in your eyes or on your skin try to flush it off with water and contact a doctor immediately. When handling a battery always wear protective glasses and gloves. Hydrogen gas is formed in battery when it is used and this gas is very flammable. So please handle the battery away from fire and in a well ventilated space.

Maintenance tips

- Check that the battery is properly attached to the car.
- Keep the battery clean and dry.
- Clean the poles of the battery and grease them lightly with Vaseline.
- Remember to sometimes check the liquid level if possible. If needed add some distilled water.
- Check the rest voltage and the density of the battery. If the density of acid is below 1.20g/ml or the rest voltage is below 12.2V the battery should be recharged.
- Don't leave car standing for months with cables attached to battery because car has small devices such as a clock which will eventually take all energy from the battery.
- When buying a battery make sure that it has a capacity recommended by the car's manufacturer. If the capacity of battery is too small the car might be unable to start.

Special batteries Hoppecke and Optima

These two batteries are actually more fitting for some other use than normal use in cars. The structure of these batteries is such that the battery acid is saturated into an absorbing glass fibre matting. This way the acid can't drain out even if the battery is held upside down.

In optima the panels are wrapped up as rolls hence the strange look of the battery. In hoppecke the panels are normal. Due to a durable structure these batteries can be well used in different kinds of machines for example farming machines. Even racing drivers have used these batteries. Nothing prevents from using these batteries in a normal car. It's just that in normal cars not all the good properties will be emphasized and in some of our tests these special batteries didn't quite make it. There are better alternatives for cold

Taking power from another car

If for some reason your car doesn't start some morning, it's time to call for some help. Another car owner can help you out or you can take power from a battery that isn't attached to a car. As cables you should use cables with good quality. Connection is commenced by first connecting the other end of the red cable to the assisting battery's plus-pole. The other end is connected to the plus-pole of the battery which is being recharged. Next phase is to connect the negative cable (usually blue or black) is connected to the assisting battery's minus-pole. The other end is not connected to the minus-pole of the battery which is being recharged but it has to be connected to a part of car which is properly earthed. The earthing point has to be clean. The cable must not be connected directly to the pole because sparks from the connection might ignite gas from the battery which is being loaded. If power has been taken from another car it's a good idea to start up the car first so that the battery's voltage would be a bit higher. When the car that is being helped has started up and when there's no fear of shutting down the connection is undone opposite the way it was created

Grades	Overall value (%)	Banner	Bitron a	Bosch	Energie	Exide Classic	Exide Ultra	Faam	Flamm	Hankook	Hoppecke	Optima	Rocket	Salam a	Solite	Trane	Trane Calcium	Varta	Zap
Cold start voltage	25	8	7	8	7	8	9	7	8	8	8	10	5	6	5	7	8	8	6
Start time	25	8	9	7	7	8	9	6	9	6	9	10	8	9	8	9	9	9	7
Spare capacity	25	9	9	8	8	9	10	7	10	9	9	8	8	10	10	9	9	9	8
Taking in power	25	9	9	8	8	9	9	9	8	9	7	7	7	8	6	8	10	8	9
Overall grade	100	8.5	8.5	7.8	7.5	8.5	9.3	7.3	8.8	8.0	8.3	8.8	7.0	8.3	7.3	8.3	9.0	8.5	7.5

Final review

Some batteries have a different capacity than others and it's marked after the model of the battery. Batteries have been reviewed as one group so that the capacity doesn't affect the final score. Cold start power is the power measured according to EN-norm and declared by the manufacturer. If the manufacturer has declared the cold start power according to norm other than EN the power equivalent to EN-norm is declared inside the brackets. 14 of the batteries had carrying handles. Some of them were very good while others weren't. Dimensions of the batteries are in millimeters. Especially the height is very limited in the low motor spaces of newer cars. Prices are recommended prices declared by import dealers. Exceptions to this are Bosch and Hoppecke as the importer of these batteries didn't have a recommended price for them. The price for these batteries is an average of prices we got from different stores.



EXIDE

Model: Ultra 47600
Capacity: 75 Ah
Cold Start power: 760 A EN
No. of plates: 17
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: Yes
Dimensions(LxWxH): 277 x 175 x 190
Recommended price: 81.50
Importer: Exide Oy
Tel. +358 9 4154 5500
Made in: Poland
Warranty: 2 years

Pros

Spare capacity

Cons

Taking in energy

Overall grade 9.3

★★★★★



TRANE

Model: Calcium 57412
Capacity: 75 Ah
Cold Start power: 760 A EN
No. of plates: 17
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH): 277 x 175 x 190
Recommended price: 75
Importer: PJP-Batteries Oy
Tel. +358 19 325 072
Made in: Thailand
Warranty: 1 years

Pros

Spare capacity

Cons

Taking in energy

Overall grade 9.0

★★★★★



FIAMM

Model: Calcium 57412
Capacity: 74 Ah
Cold Start power: 760 A EN
No. of plates: 17
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: Yes
Dimensions(LxWxH): 275 x 175 x 185
Recommended price: 75
Importer: Akro-Jalostus Oy
Tel. +358 2 824 0899
Made in: Italy
Warranty: 1 years

Pros

Spare capacity
Time to start
Carrying handle

Cons

No display for the state of charge

Overall grade 8.8

★★★★★



OPTIMA

Model: Yellowtop D1400S
Capacity: 75 Ah
Cold Start power: 975 A EN
No. of plates: N/A
Maintenance free: Yes
Carrying handles: No
Display for the state of charge: No
Dimensions(LxWxH): 325 x 165 x 238
Recommended price: 350
Importer: Oy Flinkenberg Ab
Tel. +358 9 859 911
Made in: USA
Warranty: 2 years

Pros

Cold start voltage
Time to start

Cons

Very big
Taking in charge

Overall grade 8.8

★★★★★



BANNER

Model: 57412
Capacity: 74 Ah
Cold Start power: 680 A EN
No. of plates: 15
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH): 278 x 175 x 175
Recommended price: 110
Importer: Motoral Oy
Tel. +358 9 37 541
Made in: Austria
Warranty: 1 years

Pros

Spare capacity
Taking in charge

Cons

No display for the state of charge

Overall grade 8.5

★★★★★



BILTEMA

Model: 80-572171
Capacity: 72 Ah
Cold Start power: 400 A EN
No. of plates: 15
Maintenance free: No
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH): 302 x 175 x 190
Recommended price: 59.90
Importer: Biltema Suomi Oy
Tel. +358 9 588 1002
Made in: South Korea
Warranty: 2 years

Pros

Spare capacity
Taking in charge

Cons

Cold start voltage
No display for the state of charge
Not maintenance free

Overall grade 8.5

★★★★★



EXIDE

Model: Classic 57412
Capacity: 74 Ah
Cold Start power: 680 A EN
No. of plates: 16
Maintenance free: No
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH): 302 x 175 x 190
Recommended price: 59.90
Importer: Biltema Suomi Oy
Tel. +358 9 588 1002
Made in: South Korea
Warranty: 2 years

Pros

Spare capacity
Taking in charge

Cons

Cold start voltage
No display for the state of charge
Not maintenance free

Overall grade 8.5

★★★★★



VARTA

Model: Blue Dynamic 57412
Capacity: 74 Ah
Cold Start power: 680 A EN
No. of plates: 15
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH): 278 x 175 x 190
Recommended price: 89
Importer: Varta Autonaku
Tel. +358 9 525 0335
Made in: Spain
Warranty: 1 years

Pros

Spare capacity
Time to start

Cons

No display for the state of charge

Overall grade 8.5

★★★★★



HOPPECKE

Model: 570901076
Capacity: 70 Ah
Cold Start power: 760 A EN
No. of plates: 13
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
272 x 175 x 190
Recommended price: 190
Importer: Oy Flinkenberg Ab
Tel. +358 9 859 911

Made in: Germany
Warranty: 2 years

Pros

Spare capacity
Time to start

Cons

No display for the state of charge

Overall grade 8.3
★★★★



SALAMA

Model: 316-57412
Capacity: 74 Ah
Cold Start power: 680 A EN
No. of plates: 15
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
278 x 175 x 190
Recommended price: 105.50
Importer: HL-Group Oy
Tel. +358 9 37 551

Made in: Czech Republic
Warranty: 1 years

Pros

Spare capacity
Time to start

Cons

No display for the state of charge

Overall grade 8.3
★★★★



TRANE

Model: 57412
Capacity: 74 Ah
Cold Start power: 760 A EN
No. of plates: 17
Maintenance free: No
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
275 x 175 x 190
Recommended price: 75
Importer: PJP-Batteries Oy
Tel. +358 19 325 072

Made in: Thailand
Warranty: 1 years

Pros

Spare capacity
Time to start

Cons

No display for the state of charge
Not maintenance free

Overall grade 8.3
★★★★



HANKOOK

Model: 935-57220
Capacity: 72 Ah
Cold Start power: 720 A EN
No. of plates: 15
Maintenance free: No
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
277 x 174 x 190
Recommended price: 89
Importer: Koivunen Oy
Tel. +358 9 35 011

Made in: South Korea
Warranty: 1 years

Pros

Spare capacity
Time to start

Cons

No display for the state of charge
Not maintenance free

Overall grade 8.0
★★★



BOSCH

Model: Silver 7C
Capacity: 74 Ah
Cold Start power: 680 A EN
No. of plates: 14
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
275 x 175 x 190
Recommended price: 84
Importer: Robert Bosch Oy
Tel. +358 9 435 991

Made in: Spain
Warranty: 2 years

Pros

Evenness

Cons

No display for the state of charge

Overall grade 7.8
★★★



ENERGIE

Model: 57412
Capacity: 74 Ah
Cold Start power: 700 A EN
No. of plates: 15
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
275 x 175 x 190
Recommended price: 105.20
Importer: Akkutalo Finn Sukon Oy
Tel. +358 2 489 7750

Made in: Portugal
Warranty: 1.5 years

Pros

Taking in charge

Cons

Cold start voltage
Time to start
No display for the state of charge

Overall grade 7.5
★★



ZAP

Model: 57213
Capacity: 72 Ah
Cold Start power: 680 A EN
No. of plates: N/A
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: Yes
Dimensions(LxWxH):
275 x 175 x 175
Recommended price: 60
Importer: Parkanon Autovaraosa Oy
Tel. +358 3 44 311

Made in: Poland
Warranty: 2 years

Pros

Taking in charge

Cons

Cold start voltage
Time to start

Overall grade 7.5
★★



FAAM

Model: 70L32
Capacity: 70 Ah
Cold Start power: 680 A EN
No. of plates: 14
Maintenance free: Yes
Carrying handles: Yes
Display for the state of charge: No
Dimensions(LxWxH):
275 x 175 x 190
Recommended price: 86
Importer: Oy Teboil Ab
Tel. +358 204 7001

Made in: Italy
Warranty: 2 years

Pros

Taking in charge
Carrying handle

Cons

Time to start
Cold start voltage
Spare capacity

Overall grade 7.3
★★



SOLITE

Model: 57512
Capacity: 75 Ah
Cold Start power: 320 DIN
No. of plates: 13
Maintenance free: No
Carrying handles: No
Display for the state of charge: No
Dimensions(LxWxH):
301 x 172 x 223
Recommended price: 58
Importer: Varaosamaailma Oy
Tel. +358 9 777 4262

Made in: Korea
Warranty: 2 years

Pros

Spare capacity
Ease of checking specific weight

Cons

No display for the state of charge
Not maintenance free
Cold start voltage

Overall grade 7.3
★★



ROCKET

Model: 57512
Capacity: 75 Ah
Cold Start power: 310 DIN
No. of plates: N/A
Maintenance free: No
Carrying handles: No
Display for the state of charge: No
Dimensions(LxWxH):
304 x 172 x 224
Recommended price: 79.89
Importer: Parkanon Autovaraosa Oy
Tel. +358 3 44 311

Made in: Korea
Warranty: 1.5 years

Pros

Ease of checking specific weight

Cons

No display for the state of charge
Not maintenance free
Cold start voltage

Overall grade 7.0
★