



BATTERY TECH REPORT

NORTHWESTERN UNIVERSITY (11)

Charlie Costakis – Electrical Lead

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ASC/FSGP Battery Approval Form

Submit to ascteams@americansolarchallenge.org

NOTE: The manufacturer's specification sheet, the battery's MSDS sheet with accident protocol, and a description of the protection circuitry (protection circuitry schematic, high level description, list of items protected) must also be submitted to ASC prior to approval. Battery approval is subject to verification at Scrutineering. If the manufacturer changes the battery's specifications, the new specifications must be submitted for re-approval. Teams should bring AT LEAST 3 unmodified cells for weight verification.

CONTACT INFORMATION

Date: 12/24/2019 Team Number: 11
Organization: Northwestern University Team Battery
mail: solar@u.northwestern.edu Contact: Charlie Costakis
Phone: (847)-644-6202

MANUFACTURER INFORMATION

Manufacturer:	<u>Panasonic</u>	Type (lead acid, LION, etc):	<u>Li-Ion</u>
Battery Name:	<u>NCR18650GA</u>	Model Number:	<u>NCR18650GA</u>
Battery Capacity (Ah):	<u>3.45</u>	Rate (C/3, C/20, etc):	<u>0.42C charge, 2.89C discharge</u>
Battery Mass (kg):	<u>48g per cell</u>	Battery Voltage:	<u>3.6V nom</u>
Battery Cost (US\$):	<u>\$4.04/cell</u>	Max Current per Cell:	<u>10A discharge, 1.475A charge</u>

VEHICLE BATTERY PACK SPECIFICATIONS

Number of batteries in the vehicle battery pack : 416
Pack Mass (kg): 19.97 Pack Voltage: 93.6V nominal
26 modules in series. Each module contains 16
Pack Configuration: parallel

SUPPLIER INFORMATION

The manufacturer is the Manufacturer of the battery cell This must be the **original manufacturer** not a reseller. If the supplier uses a different model name or number than the manufacturer, please provide that information, also.

No Panasonic website
Manu. URL: available, [here is reseller link](http://pages.na.industrial.panasonic.com/Batteries-Contact-Page.html) Contact: Li-Ion Wholesale (reseller)
<http://pages.na.industrial.panasonic.com/Batteries-Contact-Page.html>
Email: Page.html Phone: (888)-972-2883 (reseller)
Battery Name: NCR18650GA Flat Top 10A Supplier Model #: ncr18650ga

OTHER INFO

- Total bus voltage is 93.6V nominal, 109.2V max
- MSDS for cell chemistry included in zip file
 - The team keeps a Class D fire extinguisher on hands at all times in case of a Li-Ion fire.

Battery Box Description

The mounting method for the battery box is still being determined. However, it will be built out of fiberglass, which is resistant to the carbonate esters in the Li-Ion cell.