

What is Involved?

Designing and Building Your Own Lithium Battery

DESIGN CONSIDERATIONS

- 1) Chemistry (LCO/LMO/LFP)
- 2) Cell types (cylindrical, pouch, prismatic)
- 3) Case/terminal type (plastic/aluminum)
- 4) Size/capacity/quantity (size vs ruggedness)
- 5) Configuration (parallel then series)
- 6) Orientation (vertical-best, on edge-OK, flat-never)
- 7) Construction (C-rate/Compression)
- 8) Interconnects (material/style/hardware)
- 9) BMS (capacity/features)
- 10) Safety (fuse/thermostat)
- 11) Monitoring (BMS/battery meter)

CAUTION

- 1) Careful with bare tools around energized terminals. Incidental contact can weld tools to terminals, making the short catastrophic.
- 2) Know the voltage of everything before connecting anything. There may be some small sparks but make connections swiftly and only once.
- 3) Know the current path. Copper only. No hardware.

BUILD CONSIDERATIONS

- 1) Balancing (top or bottom?)
- 2) BMS settings (Operational limits)

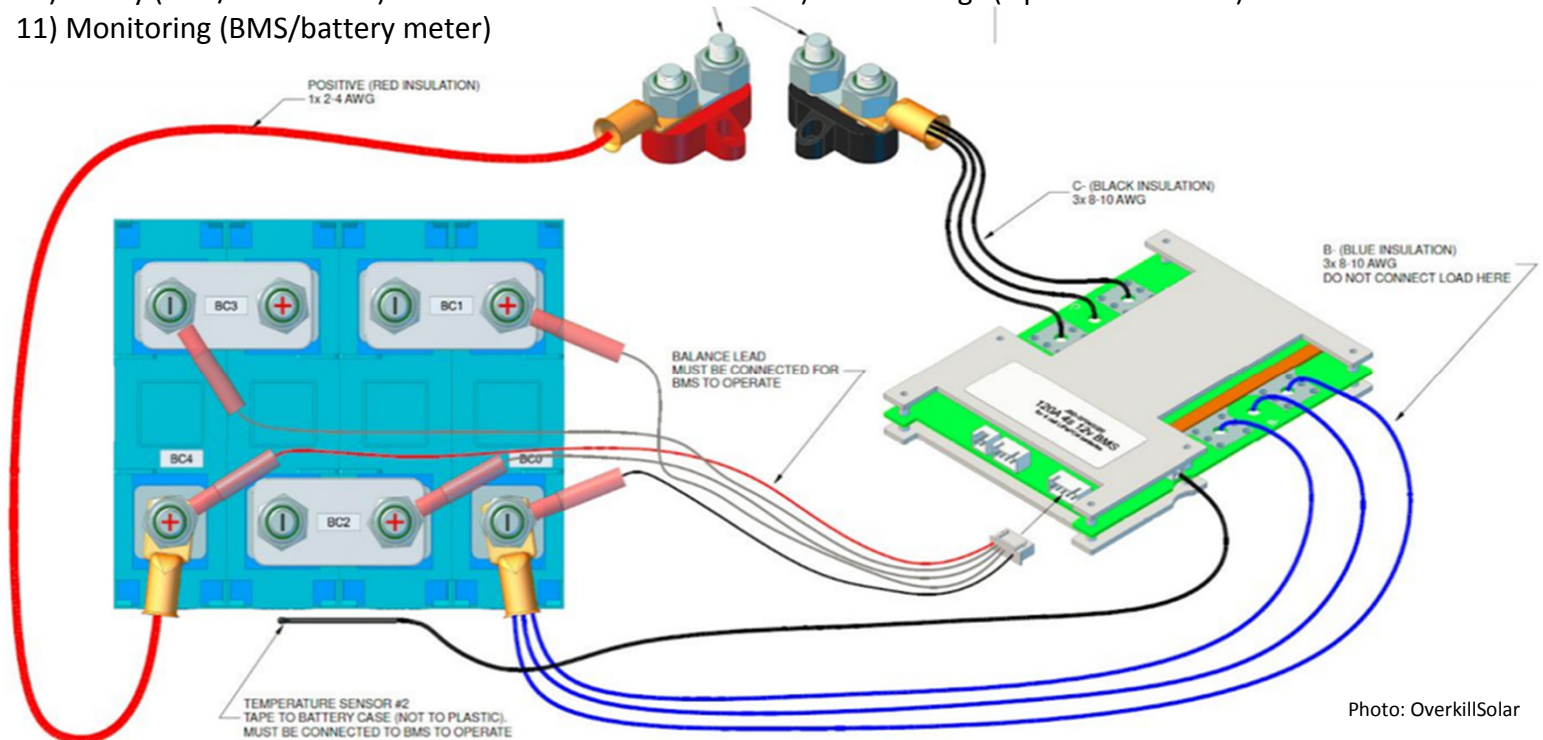
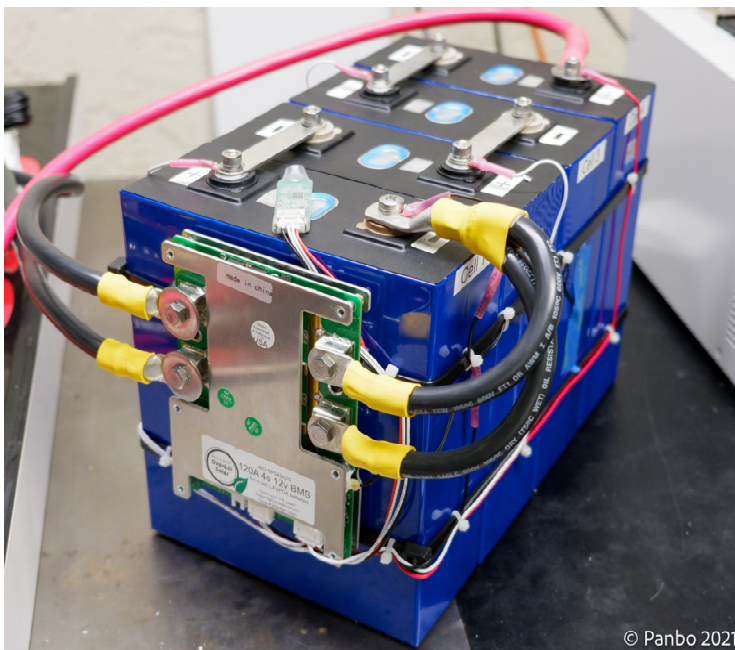


Photo: OverkillSolar



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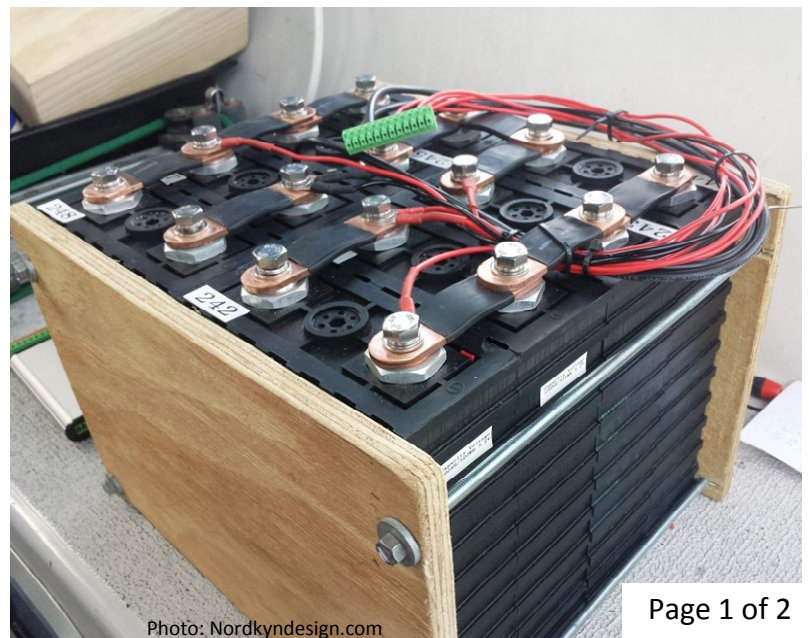
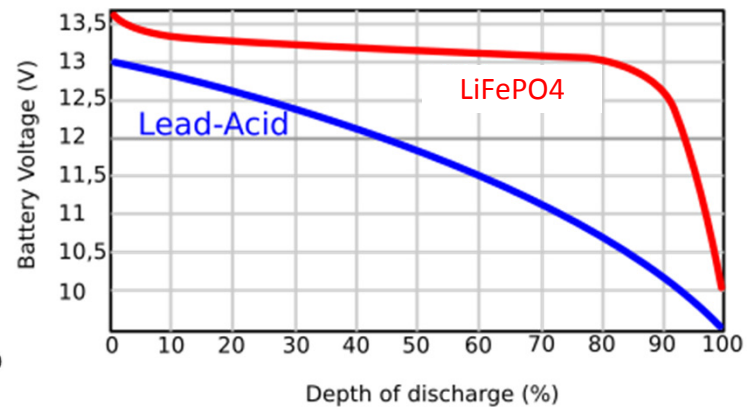
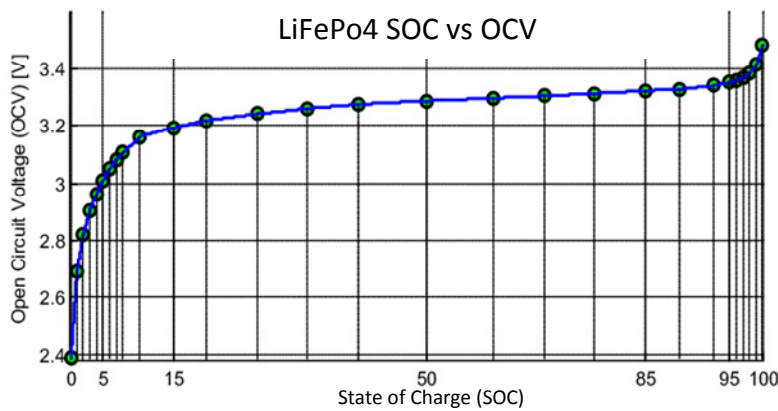
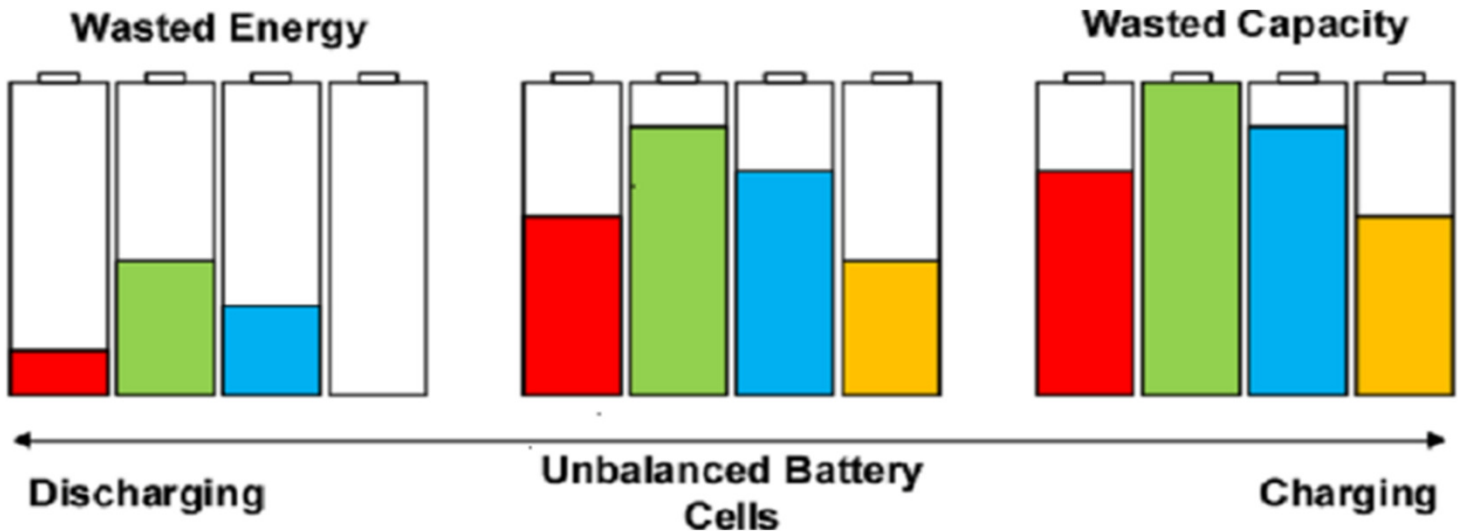


Photo: Nordkyndesign.com



Importance of Cell Balancing



BUILD PROCESS (*cells within .01V)

- 1) Charge in parallel to 3.45VPC
- 2) Charge individually to 3.55VPC
- 3) Arrange the cells and install the bus bars
- 4) Install clamps/band
- 5) Terminate the balance leads, connect, test each voltage
- 6) Mount the BMS
- 7) Mount the thermistor
- 8) Plug the balance leads into the BMS
- 9) Program the BMS
- 10) Connect the BMS power leads

SUPPLIERS (no specific recommendations)

Mobile-SolarPower.com
 ElectricCarPartsCompany.com
 BatteryEVO.com
 FullBattery.com
 LynxBattery.com
 BatterySpace.com
 BatteryHookup.com

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MATERIALS

4-8 LFP cells
 1-BMS
 6+ Bus bars (by cell size & orientation)
 8-Terminal studs & nuts or bolts
 4-18 to 24ga ring terminals
 2-3/4" plywood end plates
 4-thread rod w/nylock nuts & washers
 Cable ties

TOOLS

Wrench to fit terminal bolts (insulated)
 Voltmeter
 Terminal crimp tool(s)
 Wire cutter(s)
 Variable current/voltage DC power supply

REFERENCES

- <https://nordkyndesign.com/assembling-a-lithium-iron-phosphate-marine-house-bank/>
 - <https://panbo.com/building-a-diy-lifepo4-battery/>
 - BatteryUniversity.com
 - Will Prowse on YouTube.com

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