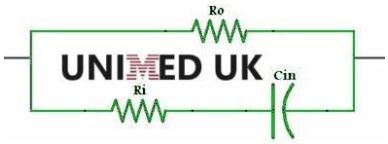
Thunder Sky
Winston Battery



FAQ: What does "LYP" battery stands for?

Battery Chemistry

Lithium Yttrium Iron Phosphate (LYP) Battery is Lithium Iron Phosphate batteries with rare earth Yttrium compound which delivers high energy and power density for mobile and stationary applications. Designed as a flat folded prismatic cell that is available in amp hour capacities up to 7,000 amp hours at 3.25 volt nominal voltage makes our product offering as largest single cell capacity available in market today. A large cell configuration reduces number of connections for energy storage applications, increasing reliability while reducing costs.

The Lithium Yttrium Iron Phosphate battery is a deep cycle which uses lithium iron phosphate as a cathode material with Yttrium added to improve thermal characteristics and life of the battery. Yttrium when added to the cathode material protects oxidation coating of the Iron molecules during high temperatures, increasing battery life. Yttrium is found in most rare earth minerals and used as a doping agent in construction of Lithium Iron Phosphate battery to strengthen Iron Phosphate molecular structure from oxidation layer damage during high temperature applications.

Safety – Lithium Batteries

Lithium-Ion Batteries are mostly named after the material used in the cathodes, while the anode materially is generally made of carbon material and variety of electrolytes. Most lithium ion batteries used in consumer electronics products use lithium cobalt oxide, lithium manganese oxide and lithium nickel oxide cathode material, known for higher energy density but lower life cycle than LYP iron phosphate cathode battery. LYP batteries offer longer life cycle due to inherent stability of iron phosphate molecule when compared to other chemistry.

Lithium Iron Phosphate is safer than other chemistries such as Lithium Cobalt due to complete oxidation of the material around 3.4 volts compared to lithium cobalt around 4.6 volts, which can lead to unsafe events. Complete oxidation of lithium iron phosphate is a stable material called Ferric Phosphate ($FePO_4$). Phosphates are inherently stable and not prone to thermal runaways and will not burn when abuse occurs. Another benefit of $LiFePO_4$ batteries is that does not contain any heavy metals therefore does not have memory effect like nickel cadmium or nickel metal hydride batteries.

Lithium batteries are much harder to ignite in event of misuse during charge cycles due to stronger bond with the oxygen atom when compared to lithium cobalt and lithium

manganese batteries, which during misuse can result in exothermic reactions. Although any battery chemistry when fully charged can only dissipate additional charge energy as heat, use of Battery Management Systems (BMS) is essential for safe operation of any lithium battery chemistry.

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