

Chilwee: General comparison with the mainstream secondary battery

Secondary battery	Li-ion (High energy)	Li-ion (High power)	Ni-MH	Ni-Cd	Lead acid	Ni-Zn
Nominal voltage	3.0V-3.7V	3.0V-3.7V	1.2V	1.2V	2.0V	1.6V
Volumetric energy density	350-550Wh/L	200-350Wh/L	200-350Wh/L	160-180Wh/L	65-120Wh/L	100-300Wh/L
Gravimetric energy density	150-250Wh/kg	100-150Wh/kg	60-100Wh/kg	50-80Wh/kg	40-60Wh/kg	60-110Wh/kg
Safty	Poor	Ok	Good	Excellent	Excellent	Excellent
Recycle	Only high-value elements	Only high-value elements	70% recycled	90% recycled	95% recycled	90% recycled
Operating temperature	0°C-45 °C	0°C-45 °C	-20 °C-45 °C	-20 °C-60 °C	-40 °C-60 °C	-40 °C-75 °C

Battery for specific application——Energy Storage System

Battery type	LiFePO ₄	Lead-carbon	Ni-Zn
Specific energy of the battery set	120Wh/kg	30Wh/kg	80Wh/kg
Specific energy of the cell	160Wh/L	70Wh/L	160Wh/L
Capacity@-10°C	≥0.90C	≥0.80C	≥0.90C
4C discharge capacity	≥0.50C	N/A	≥0.80C
Energy efficiency	88%	85%	88%
Cycle life of battery at 70%DOD@0.25C	≥5000	≥4500	≥5000
Cycle life of battery at 30%DOD@4C	≥20000	—	≥100000
Cost target	0.23€/Wh	0.13€/Wh	0.18€/Wh

Battery for specific application——Start-Stop battery

Battery type	LiFePO ₄	Ni-MH	EFB lead acid	Zn-Ni
Battery model	12V40Ah	12V40Ah	12V70Ah	12V40Ah
Specific energy density	100Wh/kg	60Wh/kg	40Wh/kg	70Wh/kg
Specific power density	500W/Kg	1000W/Kg	250W/Kg	2000W/Kg
CCA (-18°C)	≥7.2V	≥7.2V	≥7.2V	≥8.0V
Cycle life at 17.5%DOD	≥20 sets	≥20 sets	≥12 sets	≥30 sets
Operating temperature	-10°C~50°C	-30°C~65°C	-30°C~65°C	-40°C~75°C
SST cycles	≥100,000	≥150,000	≥30,000	≥200,000
Cost target	0.32 €/Wh	0.32 €/Wh	0.20 €/Wh	0.23 €/Wh

Battery for specific application——E-bike battery

Battery type	LiMn ₂ O ₄	LiFePO ₄	Ni-MH	Lead acid	Zn-Ni
Gravimetric energy density	120Wh/kg	120Wh/kg	70Wh/kg	38Wh/kg	80Wh/kg
Volumetric energy density	220Wh/L	200Wh/L	200Wh/L	100Wh/L	200Wh/L
capacity at -20°C	≥0.85C	≥0.65C	≥0.80C	≥0.75C	≥0.85C
Discharge time at 1C	54min	54min	48min	48min	≥54min
Charge time to 80%SOC	60min	60min	20min	60min	20min
Cycle life at 80%DOD	≥1000	≥2000	≥1000	≥450	≥1000
Cost target	0.10 €/Wh	0.10 €/Wh	0.10 €/Wh	0.07 €/Wh	0.10 €/Wh