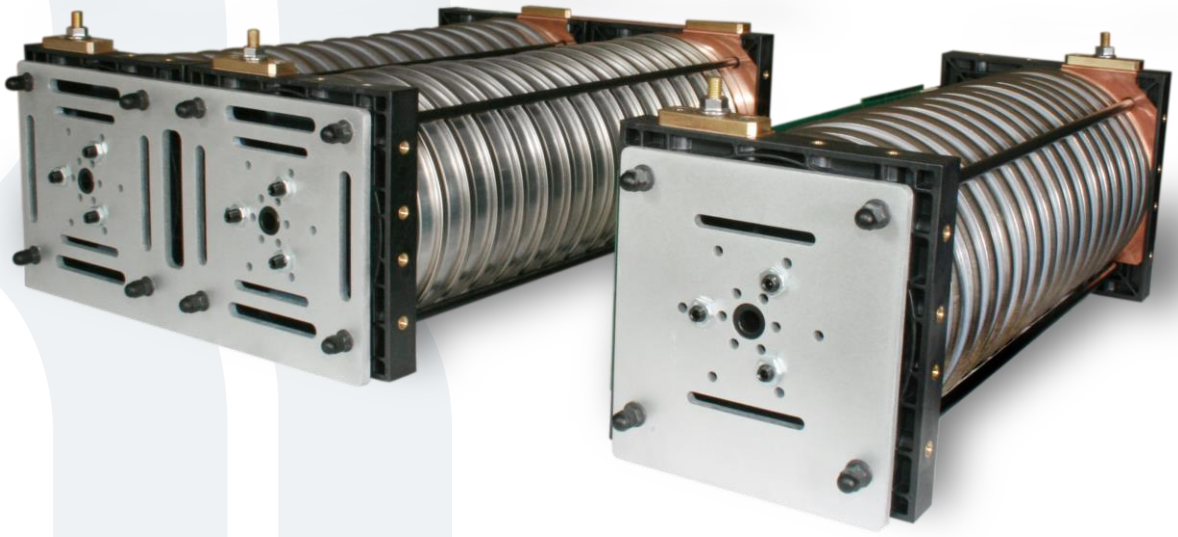
Rolled-Ribbon® Battery Module Evaluation Kits



Rolled-Ribbon produces scalable battery systems with unparalleled performance that are “tough as nails”.

The unique Rolled-Ribbon cell design enables the construction of battery systems with stacked-cell battery modules that provide unparalleled performance and are “tough as nails”.

Battery modules do not require welding of any kind, which means that cell failures no longer require the scrapping of entire battery modules. Failed cells can be removed and replaced. Cells can be harvested from battery modules and repurposed.

The cell design provides a large cell terminal surface area for high rate capability and high thermal conductivity, resulting in cooler operation with minimal temperature gradients and thermal management. BETTER CELLS … BETTER BATTERIES!

There are four kits for evaluating Rolled-Ribbon technology (see the back page). Each kit includes:

- Battery Module
- Battery Module Electronics
- Battery System Electronics
- Battery System Test/Diagnostic Electronics
- Battery System Test/Diagnostic Software
- Interconnecting Cables

Check out one of our evaluation kits to see how Rolled-Ribbon can enhance your products!

Rolled-Ribbon Advantages

- **Flexible, Modular, Scalable**
- **Stacked-Cell Design**
- **No Welding – Serviceable**
- **High Rate Capability**
- **Unparalleled Thermal Conductivity**
- **Rugged, Durable Construction**

Applications

- **Industrial Equipment**
- **Utility Vehicles**
- **Electric Vehicles**
- **Marine Vessels**
- **Transportable Power Systems**
- **Microgrids – Grid Energy Storage**
- **Uninterruptible Power Systems**

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Rolled-Ribbon Battery Module Evaluation Kits

Characteristic / Evaluation Kit	Units	EK-1C16S1P-15	EK-2C32S1P-15	EK-1C16S1P-28	EK-2C32S1P-28
Li-ion Formulation		LFPE	LFPE	LFPE	LFPE
Cell Package	mm	165x15	165x15	165x28	165x28
Series-Parallel Configuration		16S1P	32S1P	16S1P	32S1P
Nominal Voltage	V	51.2	102.4	51.2	102.4
Voltage Range	V	40.0-58.4	80.0-116.8	40.0-58.4	80.0-116.8
Capacity (@23°C, 1C)					
Coulombic	Ah	22	22	45	45
Energy	Wh	1,126	2,253	2,304	4,608
Ambient Operating Temperatures					
Discharging	°C	-20 to +45	-20 to +45	-20 to +45	-20 to +45
Charging	°C	0 to +45	0 to +45	0 to +45	0 to +45
Storage	°C	-20 to +45	-20 to +45	-20 to +45	-20 to +45
Discharging Characteristics (@23°C)					
Standard (1C)	A	22	22	45	45
Maximum Continuous (5C)	A	110	110	225	225
Peak < 15 sec (10C)	A	220	220	450	450
Charging Characteristics (@23°C)					
Charge Mode		CC-CV	CC-CV	CC-CV	CC-CV
Standard (1C)	A	22	22	45	45
Maximum Continuous (2C)	A	44	44	90	90
Peak < 15 sec (4C)	A	88	88	180	180
Power/Energy (@23°C)					
Peak Power (10C)	kW	11.3	22.5	23.0	46.1
Volumetric Densities					
Standard Energy (1C)	Wh/L	114	114	141	141
Standard Power (1C)	W/L	114	114	141	141
Peak Power (10C)	W/L	1,143	1,143	1,405	1,405
Gravimetric Densities					
Standard Energy (1C)	Wh/kg	73	73	98	98
Standard Power (1C)	W/kg	73	73	98	98
Peak Power (10C)	W/kg	731	734	980	980
DCIR (@50% DOD, 23°C)	mΩ	< 36.8	< 73.6	< 20.0	< 40.0
Physical Characteristics					
Endcap Dimensions	mm	171x180	348x180	171x180	348x180
Length Overall	mm	325	325	535	535
Battery Weight	kg	15.4	30.7	23.5	47.0

NOTES:

1. The Battery Management System (BMS) is powered from a nominal +12V to +48V auxiliary power source supplied by the host application. (Specifically, the auxiliary power source should be +9 to +58 VDC.)
2. If you have other requirements, please contact the company with your needs. We may be able to provide other evaluation kit configurations that can better meet your needs.