INVINITY ENERGY SYSTEMS

ENDURIUM™ ENTERPRISE

ENERGY STORAGE SYSTEM

PRODUCT DATA SHEET

Invinity's Endurium Enterprise™ is an evolution of our proven modular vanadium flow battery technology, optimised for mission-critical service at commercial and industrial sites including factories, data centres, warehouses, and cold storage. At its foundation is a String of two Endurium™ Modules — a UL certified flow battery that stores 350 kWh of usable energy and can be fully discharged in three hours, or as long as 18 hours depending on facility energy needs. Strings are connected to the grid using industry standard battery inverters, and combine to create up to 20 MW solutions delivering unmatched throughput and flexibility.

MORE THROUGHPUT
Take control of your commercial energy use and avoid up to 100% of peak electricity charges.

MORE FLEXIBILITY
Adapt to the changing demands of your business, with no warranty limits on cycle count.

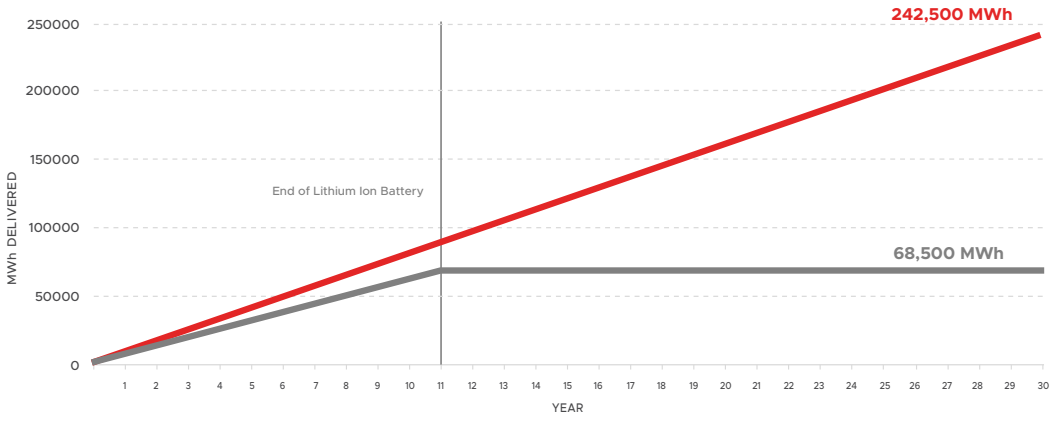
MORE LIFETIME
Suitable for over 30 years of constant cycling, matching the lifespan of on-site renewable power generation.

MORE SAFETY
Non-flammable battery chemistry dramatically reduces fire risk, operational risks and insurance premiums.

MORE SUSTAINABILITY
Run your business with 100% low-cost, low-carbon electricity, for truly carbon-neutral operations without offsets.

MORE SECURITY
Secure business critical operations with clean, reliable energy delivered from your own, on-site infrastructure.

CUMULATIVE ENERGY DELIVERED OVER TIME



Assumptions: 12 MWh capacity installed, 2 cycles per day, 100% DoD per cycle, 365 days a year. Lithium out of warranty/EOL @ 60% capacity. We charitably assume the lithium system can meet this duty cycle: its actual degradation is likely to occur much faster.

SCALABLE
1-20+
MW POWER

3-18
HOUR DISCHARGE

UNLIMITED CYCLES

UNLIMITED THROUGHPUT

NON FLAMMABLE

30+
YEAR LIFESPAN

GET MORE BATTERY™

ENDURIUM™ ENTERPRISE

STRING SPECIFICATION

COMPONENTS

An Endurium Enterprise string consists of 2 Vanadium Flow Battery Modules, a String Control Unit, and Inter-String cabling.

PERFORMANCE[1]	2 Power Blocks	3 Power Blocks
Max DC Power	150 kW	188 kW
Max Usable Energy[2]	640 kWh	700 kWh
Discharge Durations at Constant Power	4h @150 kW 8h @80 kW 10h @65 kW 12h @55 kW	4h @150 kW 8h @80 kW 10h@70 kW 12h @60 kW
Max DC RTE Max Total RTE	73% 68%	74% 69%
DC Response Time	<15 ms from On; <1 min from Off	
Voltage Range	400-650 VDC with EPC CAB1000/AC-2L.1	
Max DC Current	400A	

OPERATING CAPABILITIES	
Duty Cycle	Continuous at Max Power. No rest period
Lifetime Cycles	Unlimited for up to 30 years
Depth of Discharge	0-100 %
Cooling System	Forced Air
Communications	Modbus TCP/IP
Annual Energy Degradation	<0.2%

REQUIRED UTILITIES	
Auxiliary Supply	3Φ, 380-480 VAC
Auxiliary Loads (Average/Max)[3]	3 kW / 22 kW

CERTIFICATIONS AND STANDARDS (Expected in 2025)[4]	
Certifications	CE, UL 1973,UL 9540A, Sub Assembly under UL 9540
Standards	NFPA, IEC 62933-5-2, IEC 62485, IEC 62932-2-2

ENVIRONMENTAL	
Ambient Operating Temperature	-10°C to 45°C / 14°F to 113°F
Relative Humidity	5-95%
Maximum Elevation	2000 m / 6600 ft
Protection Class	IP 54

FOOTPRINT	
String Footprint (inc/service access)	8.7m x 10.9m / 28 ft x 36 ft
Area	53 m^2 / 560 ft^2
Energy Density	~85 MWh/Acre

BATTERY MODULE DIMENSIONS (2 PER STRING)	
Dimensions	6.1 m x 2.4 m x 2.6 m 20 ft x 8 ft x 8.5 ft
Mass	27,500 kg / 61,000 lbs

NOTES: 1 Performance values are for operation with electrolyte at 35°C. DNV IE Study available under NDA. Contact Invinity for more information.
2 Usable DC capacity varies depending on discharge profile.
3 Aux load excludes cooling fans, which are temperature dependant.
4 Only the core list of codes and compliance is provided. Contact Invinity for the compliance status of codes not referenced.

CONFIGURABLE ARRAY

Strings are configured then connected in parallel to make an Array sized for site power needs. At right is an eight string, 5.5 MWh array, capable of delivering power of 1.5 MW for 4 hours. Minimum Array size is 4 MWh.

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