

# the power of tomorrow

CLEAN ENERGY DEFINES THE WORLD THAT WE LIVE IN TODAY AND TOMORROW.  
LEAD CRYSTAL® TECHNOLOGY CREATES POWER THAT IS CLEAN SAFE AND  
HIGH PERFORMING FOR A BETTER FUTURE

**LEAD  
CRYSTAL®**  
BATTERIES

POWERED BY  
**Betta Batteries**

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## SPECIFICATION

Nominal Voltage	6V		
Rated Capacity (3 hour rate)	180 AH		
Dimension	Total Height (top of terminal)	275 mm	10.82"
	Height	275 mm	10.82"
	Length	260 mm	10.23"
	Width	180 mm	7.09"

Weight	Approximately 33 kg / 72.69 lbs		
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Capacity 25°C	10 hour rate (24A)	230 AH
	5 hour rate (40A)	200 AH
	2 hour rate (80A)	160 AH

Internal Resistance	Fully charged Battery (25°C)	=<1.5mΩ
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Self-Discharge 25°C	Capacity after 3 month storage	95%
	Capacity after 6 month storage	85%
	Capacity after 12 month storage	80%

Max Discharge Current 25°C	1800A (5S)
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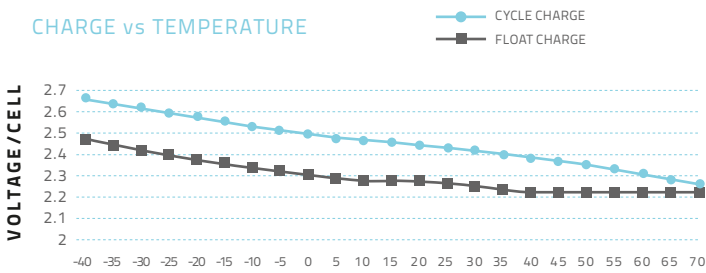
Terminal	Standard	M8
	Optional	

Charging (Constant Voltage)	Cycle	Initial Charging Current 36A 7.35V (25°C)
	Float	6.85V (25°C)

## DISCHARGE CURRENT AND END VOLTAGE

Discharge current (A)	End voltage (V)
0.05C or below or Intermittent discharge	5.70
0.05C of current close to it	5.55
0.1C of current close to it	5.40
0.2C of current close to it	5.25
From 0.2C to 0.5C	5.10
From 0.5C to 1C	4.80
From 1C to 3C	4.50
Current in excess of 3C	3.90

## CHARGE vs TEMPERATURE



## CHARGE vs TEMPERATURE CHART

temperature	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
Cycle Charge	2.66	2.64	2.62	2.60	2.58	2.56	2.54	2.52	2.50	2.48	2.47	2.47	2.45	2.45	2.43	2.41	2.39	2.37	2.35	2.33	2.31	2.29	2.27
Float Charge (voltage/cell)	2.46	2.44	2.42	2.40	2.38	2.36	2.34	2.32	2.31	2.30	2.29	2.29	2.29	2.27	2.26	2.24	2.23	2.23	2.23	2.23	2.23	2.23	2.23

## CONSTANT CURRENT DISCHARGE CHARACTERISTICS: UNITS AMPERES (25°C)

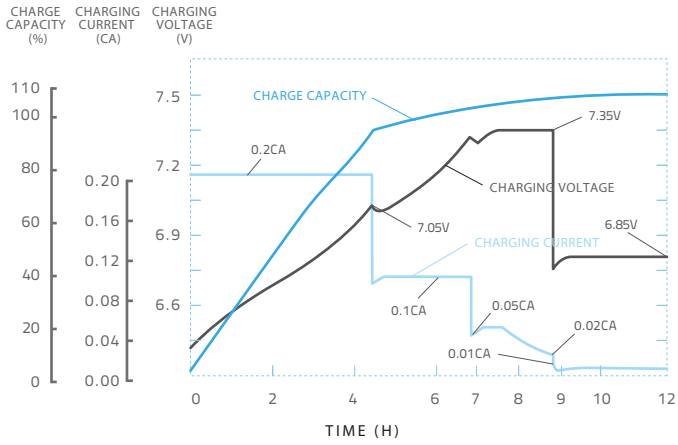
End Voltage per cell	5min	15min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	12h	20h	24h
1.60V	581	370	244	183	126	84.9	64.5	51.4	43.0	39.4	31.6	24.1	21.2	13.2	10.6
1.67V	500	336	226	174	125	83.8	63.0	50.3	42.1	37.6	30.4	23.6	20.8	12.9	10.6
1.70V	477	325	219	172	124	82.7	62.3	49.3	41.4	36.1	29.6	23.4	20.7	12.8	10.6
1.75V	434	304	210	165	123	81.7	61.6	48.3	40.8	34.7	28.7	23.2	20.5	12.6	10.6
1.80V	383	279	202	159	122	80.6	60.2	47.5	39.9	34.6	28.1	23.0	20.1	12.4	10.5
1.83V	335	255	187	148	119	79.5	58.7	45.5	39.1	33.3	27.1	22.3	19.2	12.3	10.2
1.85V	286	231	172	136	116	78.4	56.6	43.8	38.2	32.2	26.2	21.6	18.6	12.1	9.95

## DISCHARGE DATA WITH CONSTANT POWER UNITS: WATTS PER CELL (25°C)

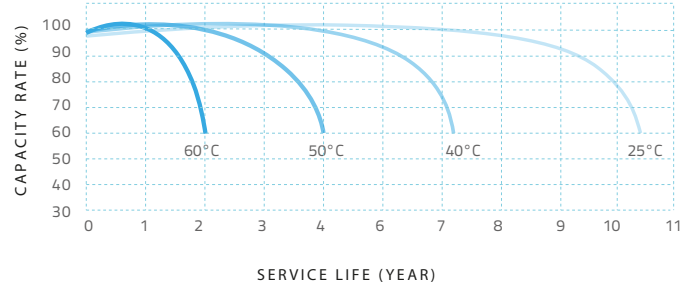
End Voltage per cell	5min	15min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	12h	20h	24h
1.60V	958	645	441	336	234	170	119	96.4	82.1	72.0	58.3	47.5	39.8	24.7	20.7
1.67V	856	601	413	322	234	164	119	96.0	80.4	71.2	57.1	46.4	39.8	24.7	20.7
1.70V	828	586	402	318	233	160	116	95.4	79.3	70.8	57.0	45.9	39.8	24.7	20.7
1.75V	764	551	388	308	232	155	114	93.9	78.6	69.7	55.8	45.5	39.8	24.7	20.6
1.80V	693	507	375	299	231	150	113	92.1	77.5	68.6	54.9	45.0	38.6	24.4	20.6
1.83V	612	470	350	280	230	144	113	89.2	76.9	66.7	53.0	43.9	37.7	24.4	20.1
1.85V	531	432	325	261	225	139	112	85.9	75.9	64.8	51.2	42.7	36.8	24.2	19.6

CHARGE CHARACTERISTIC 77°F (25°C)

REGULAR CYCLE CHARGE CHARACTERISTICS 77°F (25°C)

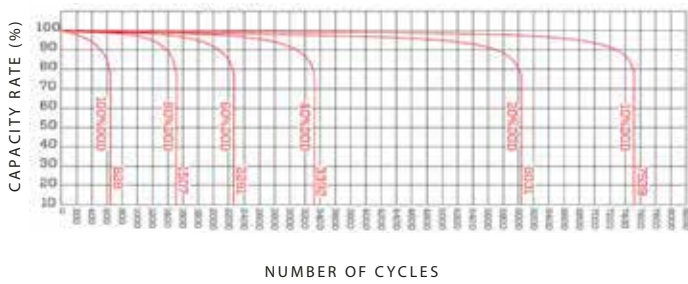


TEMPERATURE AND FLOAT SERVICE LIFE

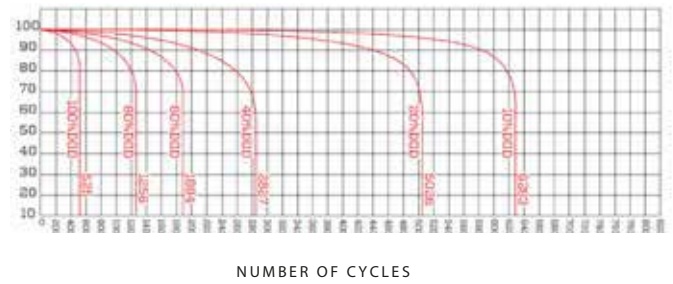


CYCLE LIFE CURVE GRAPH

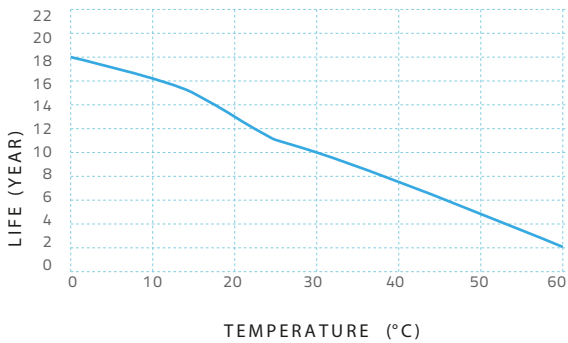
CYCLE LIFE CURVE GRAPH ( 25°C)



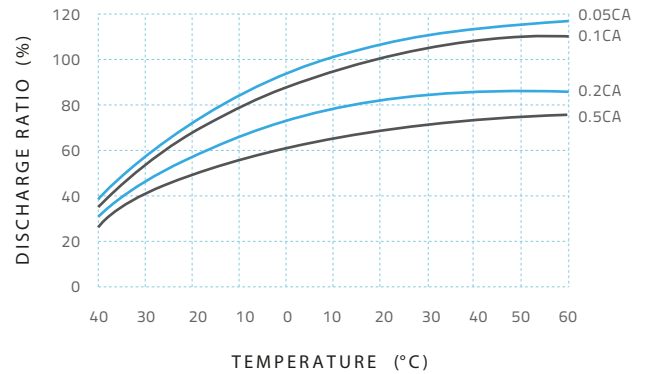
CYCLE LIFE CURVE GRAPH ( 40°C)



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



## LEAD CRYSTAL®: CHANGING THE FUTURE

**Performance** Robust, resilient, high performing. Lead Crystal® batteries can be discharged deeper, cycled more often (also in extreme temperatures) and have a longer service life. They recover to full rated capacity over and over again.

**Technology** A unique micro-porous high absorbent mat (AGM), high-purity lead calcium selenium plates, safe SiO<sub>2</sub> electrolyte solution that solidifies into a white crystalline powder when charged/discharged.

**Cleaner & safe** Less acid, no cadmium, no antimony. Lead Crystal® batteries are up to 99% recyclable and are classified as non-hazardous goods for transport.

**Markets** Lead Crystal® batteries are being used in telecoms, ups, petrochem/marine, defence, renewable energy, health care, manufacturing, transportation and electric motion (wheelchairs, golf carts & trolleys).

