

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



SPECIFICATION

Nominal Voltage	12V		
Rated Capacity (10 hour rate)	90 AH		
Dimension	Total Height	240mm	9.44"
	Height	206mm	8.11"
	Length	306mm	12.05"
	Width	174mm	6.85"
Weight	Approximately 28kg / 61.72 lbs		

DISCHARGE CURRENT AND END VOLTAGE

Discharge current (A)	End voltage (V)
0.05C or below or Intermittent discharge	11.4
0.05C of current close to it	11.1
0.1C of current close to it	10.8
0.2C of current close to it	10.5
From 0.2C to 0.5C	10.2
From 0.5C to 1C	9.6
From 1C to 3C	9.0
Current in excess of 3C	7.8

Capacity	120 hour rate (0.9A)	108 AH
25°C	20 hour rate (5.0A)	100 AH
	10 hour rate (9A)	90 AH

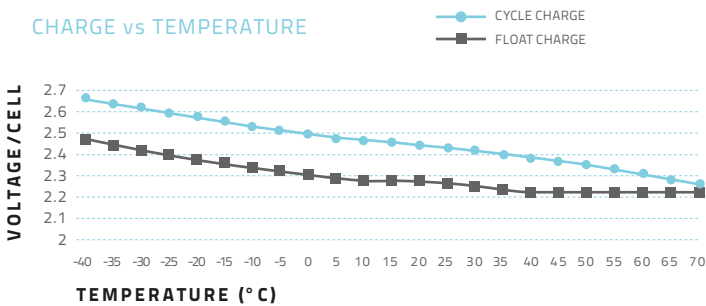
Internal Resistance	Fully charged Battery (25°C)	6.3mΩ
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Self-Discharge 25°C	Capacity after 3 month storage	95%
	Capacity after 6 month storage	85%
	Capacity after 12 month storage	80%

Max Discharge Current 25°C	900A(5S)
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Terminal	Standard	F3
	Optional	
Charging (Constant Voltage)	Cycle	Initial Charging Current 27A 14.7V/ (25°C)
	Float	13.6V/ (25°C)

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 (voltage/cell)	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)

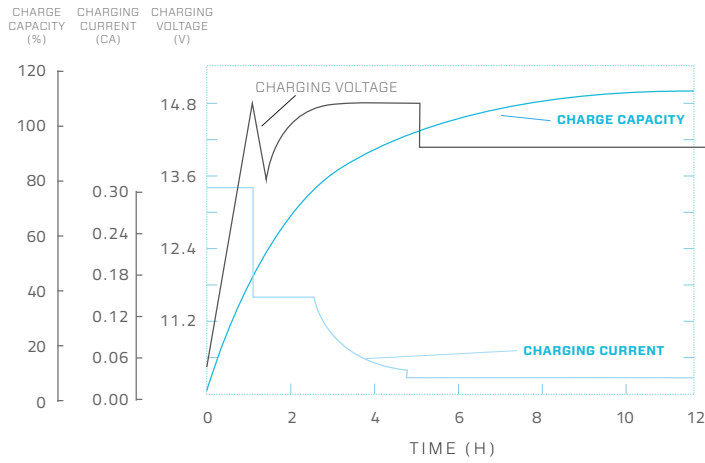
End Voltage per cell	5min	15min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	12h	20h	24h
1.60V	330.26	174.78	105.61	76.99	62.01	35.53	25.80	20.24	17.26	14.67	11.18	9.31	7.82	5.09	4.16
1.67V	306.94	169.06	104.04	76.46	61.90	35.38	25.34	20.13	17.01	14.57	11.17	9.21	7.80	5.07	4.14
1.70V	303.80	166.46	103.00	75.43	61.39	35.06	25.18	20.03	16.75	14.41	11.13	9.21	7.78	5.06	4.14
1.75V	278.32	161.24	101.97	74.92	60.35	34.39	25.07	19.78	16.60	14.31	11.08	9.10	7.74	5.04	4.13
1.80V	249.70	150.84	97.79	72.83	58.79	33.87	24.97	19.72	16.39	14.15	11.03	9.00	7.70	4.86	4.12
1.83V	238.68	138.38	96.25	70.24	56.19	33.55	23.98	18.88	16.02	13.63	10.79	8.64	7.39	4.81	4.07
1.85V	223.67	134.21	90.00	67.63	54.62	32.20	23.36	18.62	15.61	13.18	10.67	8.53	7.28	4.76	4.03

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	551.88	306.90	197.66	144.08	115.91	67.10	49.05	38.86	32.82	28.19	21.74	18.00	15.14	10.09	8.27
1.67V	525.36	302.21	189.67	143.05	116.00	67.10	48.43	38.80	32.82	28.14	21.74	17.95	15.14	10.09	8.27
1.70V	522.23	300.13	189.58	143.05	114.95	66.58	48.32	38.66	32.30	27.93	21.59	17.79	14.98	10.04	8.27
1.75V	486.35	296.49	189.79	143.04	114.44	66.06	48.22	38.60	32.20	27.72	21.48	17.67	14.98	10.04	8.22
1.80V	446.30	281.40	185.70	140.44	113.92	66.06	48.17	38.49	31.99	27.72	21.43	17.58	14.98	9.78	8.22
1.83V	430.69	258.52	184.14	136.28	109.23	65.54	46.81	37.19	31.63	26.84	21.43	17.06	14.72	9.68	8.17
1.85V	398.96	252.79	171.13	131.09	106.11	63.98	45.51	36.72	30.74	26.32	20.60	16.91	14.46	9.57	8.11

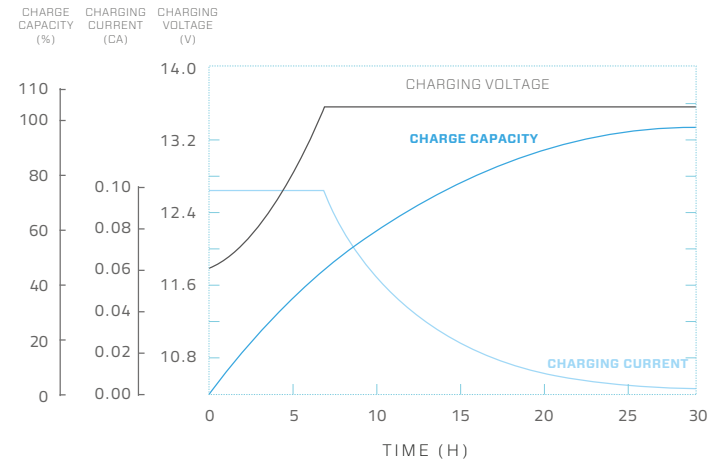
CYCLE CHARGE CHARACTERISTIC (25°C)

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



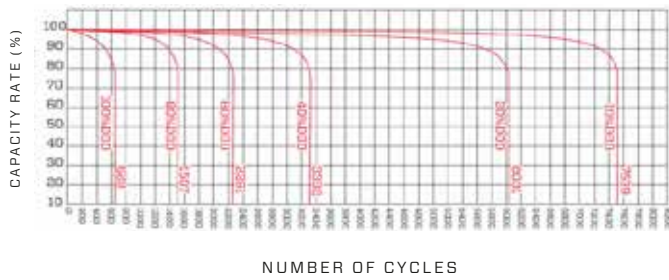
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

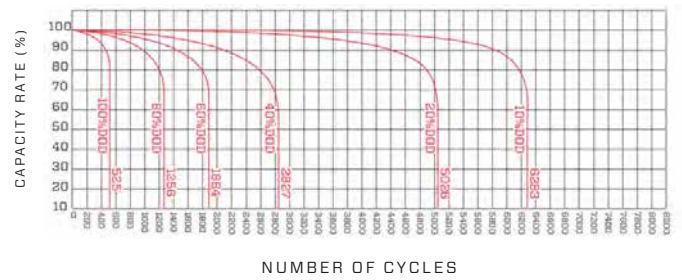


CYCLE LIFE CURVE GRAPH

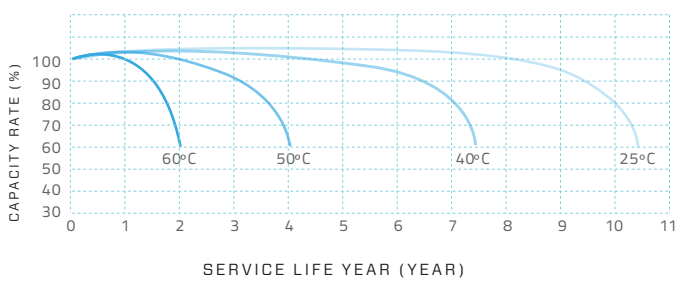
CYCLE LIFE CURVE GRAPH (25°C)



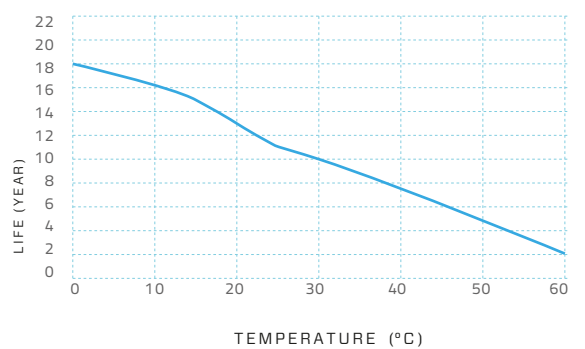
CYCLE LIFE CURVE GRAPH (40°C)



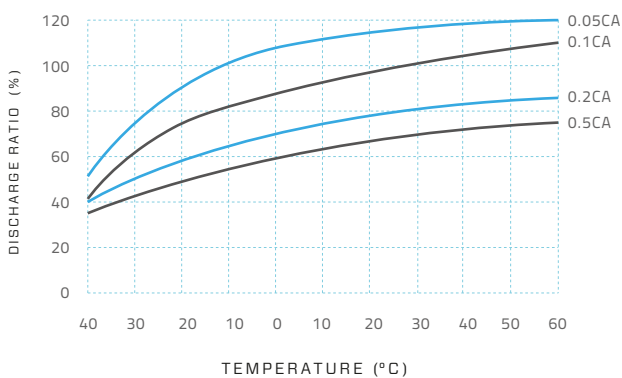
TEMPERATURE & FLOAT SERVICE LIFE



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 SiO₂ 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).

