

# 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**

# LEAD CRYSTAL<sup>®</sup> BATTERIES

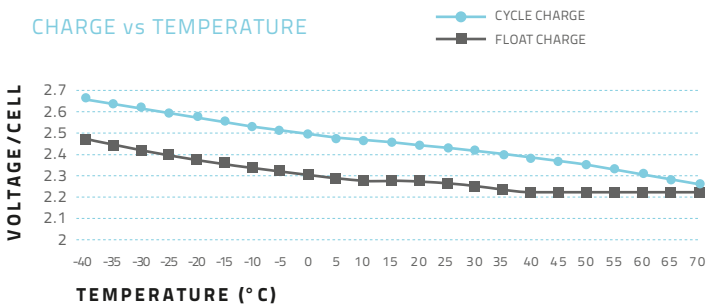
POWERED BY  
**Betta Batteries**



## 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

## 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	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	256.87	135.94	82.14	59.88	48.23	27.63	20.07	15.74	13.42	11.41	8.70	7.24	6.08	3.96	3.23
1.67V	238.73	131.49	80.92	59.47	48.15	27.51	19.71	15.66	13.23	11.33	8.69	7.16	6.07	3.95	3.22
1.70V	236.29	129.47	80.11	58.67	47.75	27.27	19.58	15.58	13.03	11.21	8.66	7.16	6.05	3.93	3.22
1.75V	216.47	125.41	79.31	58.27	46.94	26.75	19.50	15.38	12.91	11.13	8.62	7.08	6.02	3.92	3.21
1.80V	194.21	117.32	76.06	56.64	45.72	26.34	19.42	15.34	12.75	11.01	8.58	7.00	5.99	3.78	3.20
1.83V	185.64	107.63	74.86	54.63	43.70	26.10	18.65	14.69	12.46	10.60	8.40	6.72	5.75	3.74	3.16
1.85V	173.96	104.38	70.00	52.60	42.48	25.05	18.17	14.48	12.14	10.25	8.30	6.64	5.66	3.70	3.14

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

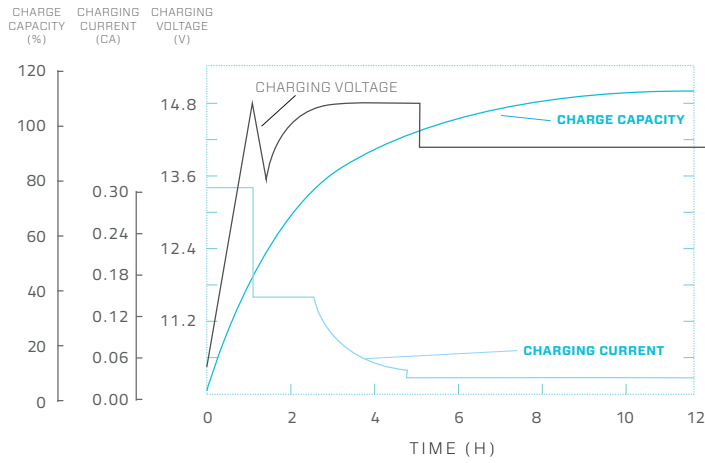
End Voltage per cell	5min	15min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	12h	20h	24h
1.60V	429.24	238.70	153.74	112.07	90.15	52.19	38.15	30.22	25.53	21.93	16.91	14.00	11.77	7.85	6.43
1.67V	408.61	235.05	147.52	111.26	90.22	52.19	37.67	30.18	25.53	21.89	16.91	13.96	11.77	7.85	6.43
1.70V	406.18	233.43	147.45	111.26	89.41	51.78	37.58	30.07	25.12	21.73	16.79	13.84	11.65	7.81	6.43
1.75V	378.27	230.60	147.61	111.26	89.01	51.38	37.50	30.02	25.04	21.56	16.71	13.74	11.65	7.81	6.39
1.80V	347.12	218.87	144.43	109.23	88.60	51.38	37.46	29.94	24.88	21.56	16.67	13.67	11.65	7.61	6.39
1.83V	334.98	201.07	143.22	106.00	84.96	50.98	36.41	28.93	24.60	20.88	16.67	13.27	11.45	7.53	6.35
1.85V	310.30	196.62	133.10	101.96	82.53	49.76	35.40	28.56	23.91	20.47	16.02	13.15	11.25	7.44	6.31

## SPECIFICATION

Nominal Voltage	12V		
Rated Capacity (10 hour rate)	70 AH		
Dimension	Total Height (top of terminal)	215 mm	8.46"
	Height	210 mm	8.27"
	Length	259 mm	10.2"
	Width	169 mm	6.65"
Weight	Approximately 22.5kg / 49.60 lbs		
Capacity	120 hour rate (0.7A)	84 AH	
	25°C 20 hour rate (3.9A)	78 AH	
	10 hour rate (7A)	70 AH	
Internal Resistance	Fully charged Battery (25°C)	7mΩ	
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	700A (5S)		
Terminal	Standard	F3	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 21A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

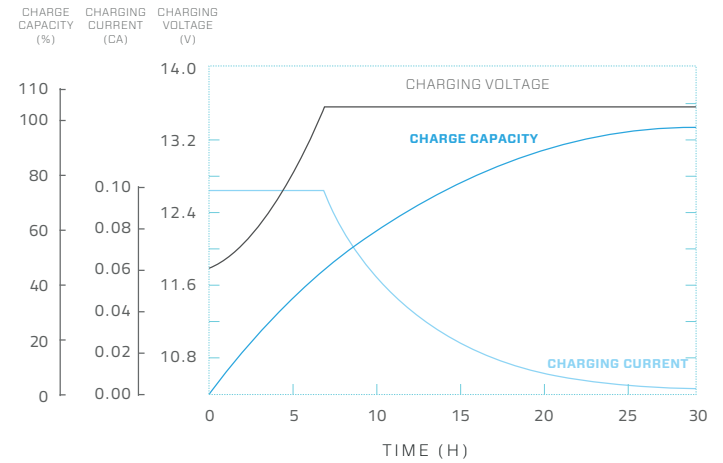
**CYCLE CHARGE CHARACTERISTIC (25°C)**

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



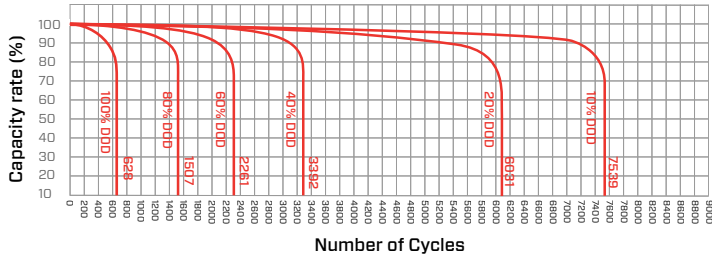
**FLOATING CHARGE CHARACTERISTIC (25°C)**

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

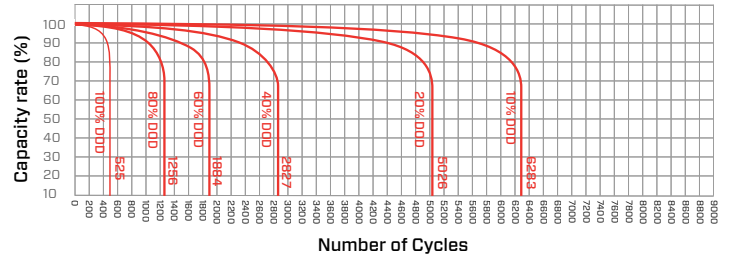


**CYCLE LIFE CURVE GRAPH**

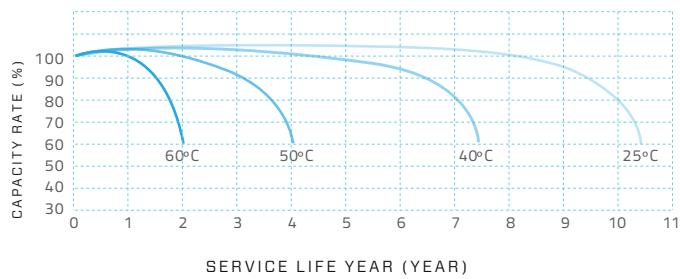
Cycle life curve graph (25°C) 12V



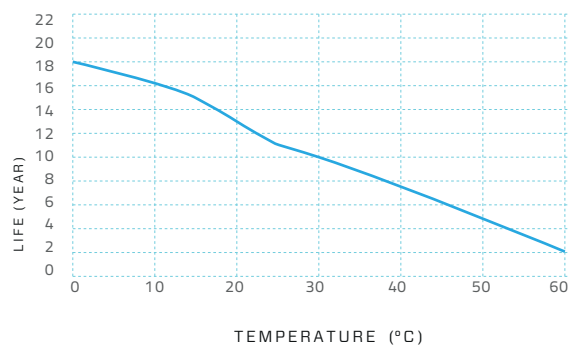
Cycle life curve graph (40°C) 12V



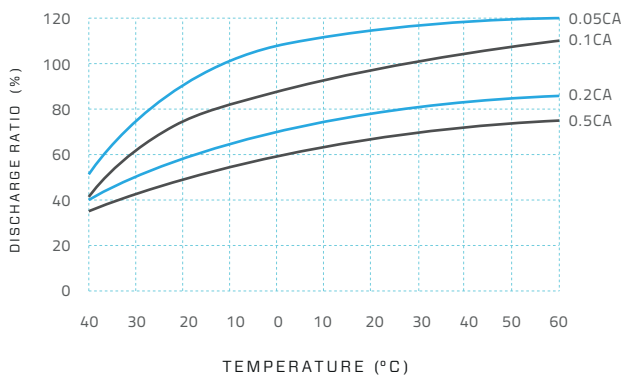
**TEMPERATURE & FLOAT SERVICE LIFE**



**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 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).

