LEAD CRYSTAL® BATTERIES

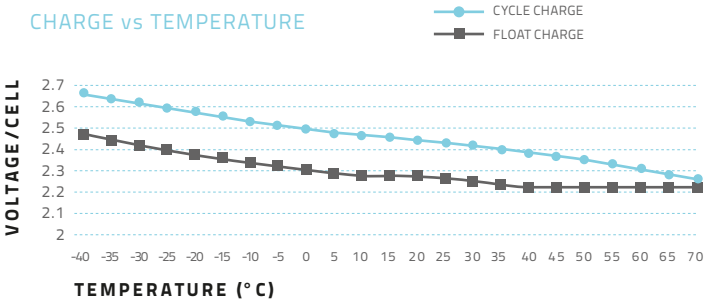
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		7.2 AH	
Dimension	Total Height (top of terminal)	100 mm	3.94 "
	Height	94 mm	3.7"
	Length	151 mm	5.94"
	Width	65 mm	2.56"
Weight		Approximately 2.3 kg / 5.07 lbs	
Capacity 25°C	120 hour rate (70mA)	8.4 AH	
	20 hour rate (390mA)	7.8 AH	
	10 hour rate (720mA)	7.2 AH	
Internal Resistance	Fully charged Battery (25°C)	30mΩ	
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	72A (5S)		
Terminal	Standard	F1	
	Optional	F2	
Charging (Constant Voltage)	Cycle	Initial Charging Current 2.16A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

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 (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	26.42	13.98	8.45	6.16	4.96	2.84	2.06	1.62	1.38	1.17	0.89	0.74	0.63	0.41	0.33
1.67V	24.55	13.52	8.32	6.12	4.95	2.83	2.03	1.61	1.36	1.17	0.89	0.74	0.62	0.41	0.33
1.70V	24.30	13.32	8.24	6.03	4.91	2.81	2.01	1.60	1.34	1.15	0.89	0.74	0.62	0.40	0.33
1.75V	22.27	12.90	8.16	5.99	4.83	2.75	2.01	1.58	1.33	1.14	0.89	0.73	0.62	0.40	0.33
1.80V	19.98	12.07	7.82	5.83	4.70	2.71	2.00	1.58	1.31	1.13	0.88	0.72	0.62	0.39	0.33
1.83V	19.09	11.07	7.70	5.62	4.49	2.68	1.92	1.51	1.28	1.09	0.86	0.69	0.59	0.38	0.33
1.85V	17.89	10.74	7.20	5.41	4.37	2.58	1.87	1.49	1.25	1.05	0.85	0.68	0.58	0.38	0.32

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	44.15	24.55	15.81	11.53	9.27	5.37	3.92	3.11	2.63	2.26	1.74	1.44	1.21	0.81	0.66
1.67V	42.03	24.18	15.17	11.44	9.28	5.37	3.87	3.10	2.63	2.25	1.74	1.44	1.21	0.81	0.66
1.70V	41.78	24.01	15.17	11.44	9.20	5.33	3.87	3.09	2.58	2.23	1.73	1.42	1.20	0.80	0.66
1.75V	38.91	23.72	15.18	11.44	9.15	5.28	3.86	3.09	2.58	2.22	1.72	1.41	1.20	0.80	0.66
1.80V	35.70	22.51	14.86	11.24	9.11	5.28	3.85	3.08	2.56	2.22	1.71	1.41	1.20	0.78	0.66
1.83V	34.46	20.68	14.73	10.90	8.74	5.24	3.75	2.98	2.53	2.15	1.71	1.36	1.18	0.77	0.65
1.85V	31.92	20.22	13.69	10.49	8.49	5.12	3.64	2.94	2.46	2.11	1.65	1.35	1.16	0.77	0.65

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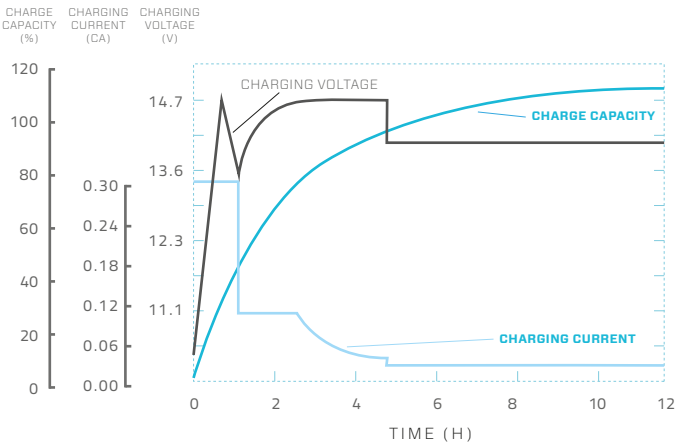
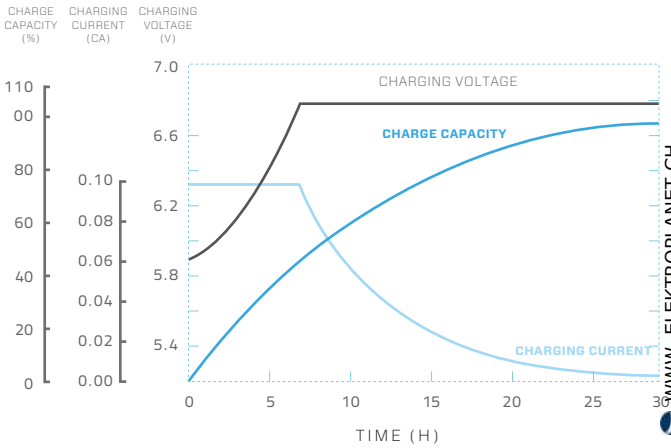
CYCLE CHARGE CHARACTERISTIC (25°C)

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



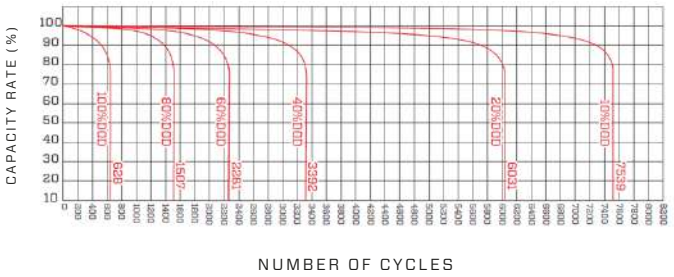
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

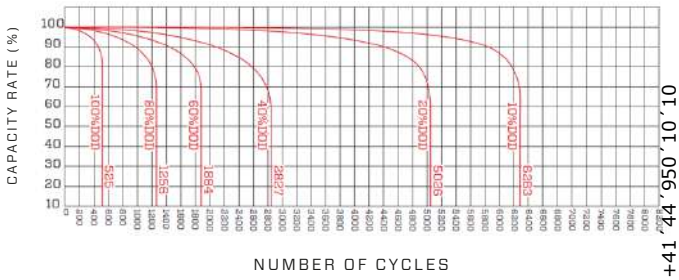


CYCLE LIFE CURVE GRAPH

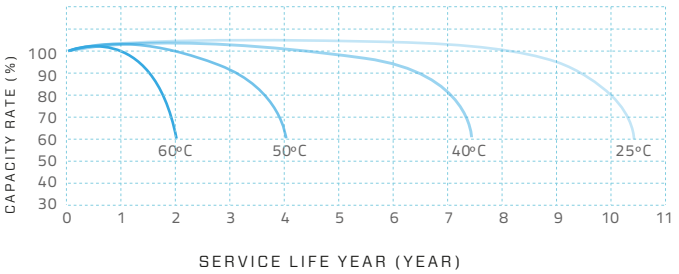
CYCLE LIFE CURVE GRAPH (25°C)



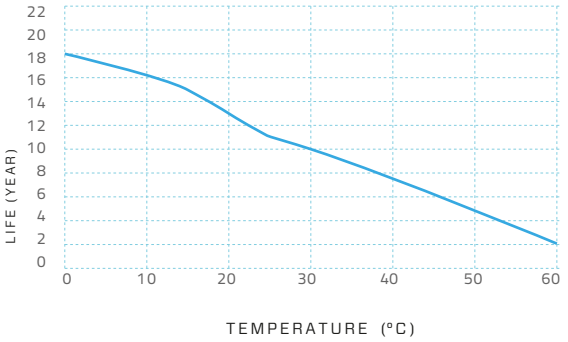
CYCLE LIFE CURVE GRAPH (40°C)



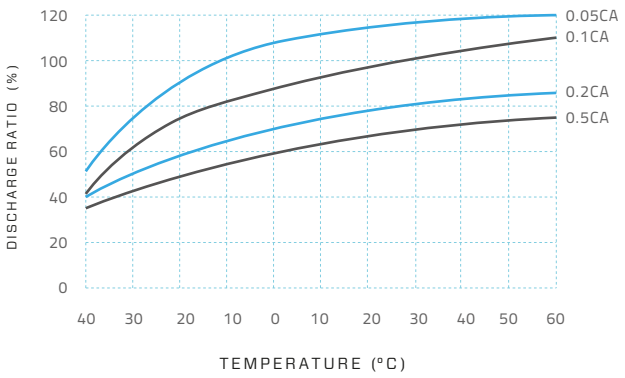
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

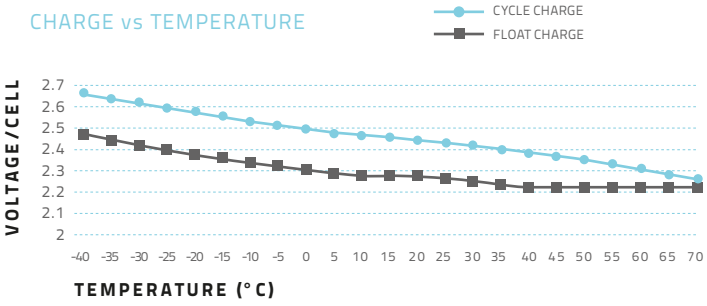
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		10 AH	
Dimension	Total Height (top of terminal)	102 mm	4.02"
	Height	94 mm	3.7"
	Length	151 mm	5.94"
	Width	99 mm	3.9"
Weight		Approximately 3.50 kg / 7.71 lbs	
Capacity 25°C	120 hour rate (110mA)	13.2 AH	
	20 hour rate (600A)	12 AH	
	10 hour rate (1.0A)	10 AH	
Internal Resistance	Fully charged Battery (25°C)	12.5mΩ	
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	100A (5S)		
Terminal	Standard	F6	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 3A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

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 (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	36.70	19.42	11.73	8.55	6.89	3.95	2.87	2.25	1.92	1.63	1.24	1.03	0.87	0.57	0.46
1.67V	34.10	18.78	11.56	8.50	6.88	3.93	2.82	2.24	1.89	1.62	1.24	1.02	0.87	0.56	0.46
1.70V	33.76	18.50	11.44	8.38	6.82	3.90	2.80	2.23	1.86	1.60	1.24	1.02	0.86	0.56	0.46
1.75V	30.92	17.92	11.33	8.32	6.71	3.82	2.79	2.20	1.84	1.59	1.23	1.01	0.86	0.56	0.46
1.80V	27.74	16.76	10.87	8.09	6.53	3.76	2.77	2.19	1.82	1.57	1.23	1.00	0.86	0.54	0.46
1.83V	26.52	15.38	10.69	7.80	6.24	3.73	2.66	2.10	1.78	1.51	1.20	0.96	0.82	0.53	0.45
1.85V	24.85	14.91	10.00	7.51	6.07	3.58	2.60	2.07	1.73	1.46	1.19	0.95	0.81	0.53	0.45

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	61.32	34.10	21.96	16.01	12.88	7.46	5.45	4.32	3.65	3.13	2.42	2.00	1.68	1.12	0.92
1.67V	58.37	33.58	21.07	15.89	12.89	7.46	5.38	4.31	3.65	3.13	2.42	1.99	1.68	1.12	0.92
1.70V	58.03	33.35	21.06	15.89	12.77	7.40	5.37	4.30	3.59	3.10	2.40	1.98	1.66	1.12	0.92
1.75V	54.04	32.94	21.09	15.89	12.72	7.34	5.36	4.29	3.58	3.08	2.39	1.96	1.66	1.12	0.91
1.80V	49.59	31.27	20.63	15.60	12.66	7.34	5.35	4.28	3.55	3.08	2.38	1.95	1.66	1.09	0.91
1.83V	47.85	28.72	20.46	15.14	12.14	7.28	5.20	4.13	3.51	2.98	2.38	1.90	1.64	1.08	0.91
1.85V	44.33	28.09	19.01	14.57	11.79	7.11	5.06	4.08	3.42	2.92	2.29	1.88	1.61	1.06	0.90

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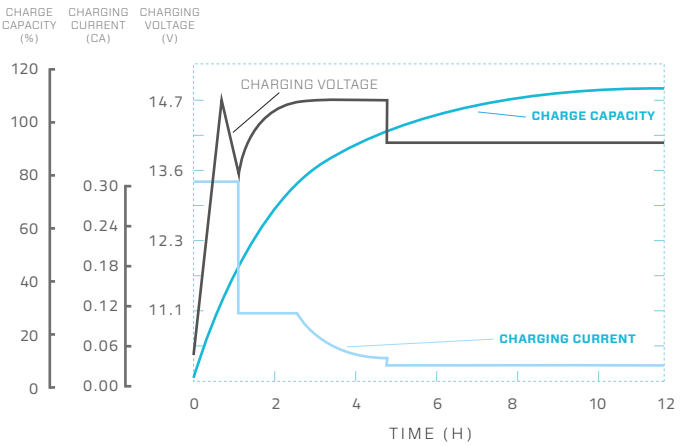
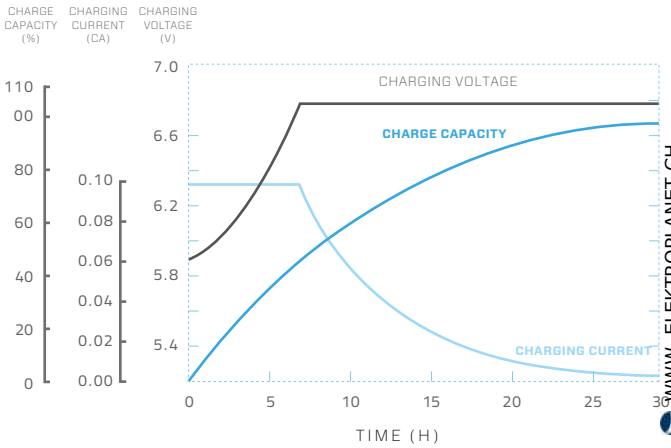
CYCLE CHARGE CHARACTERISTIC (25°C)

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



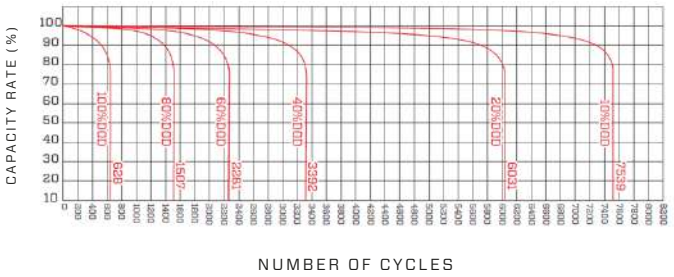
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

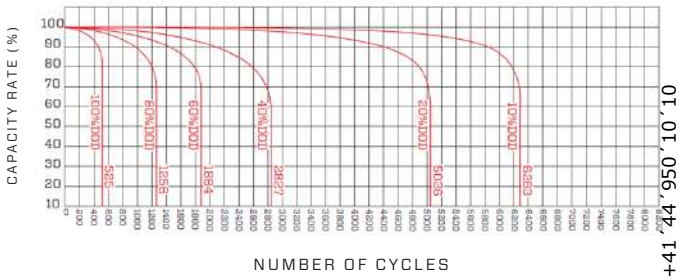


CYCLE LIFE CURVE GRAPH

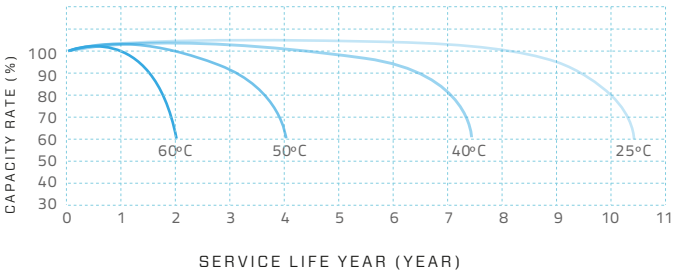
CYCLE LIFE CURVE GRAPH (25°C)



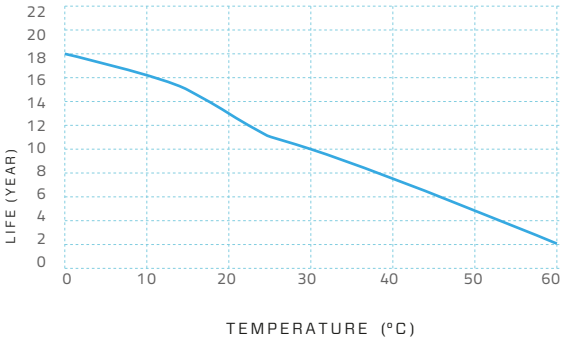
CYCLE LIFE CURVE GRAPH (40°C)



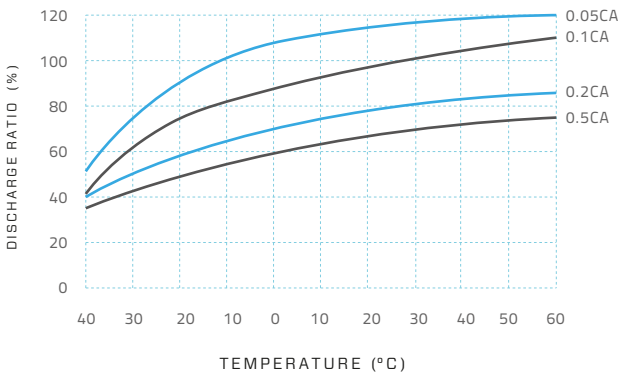
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

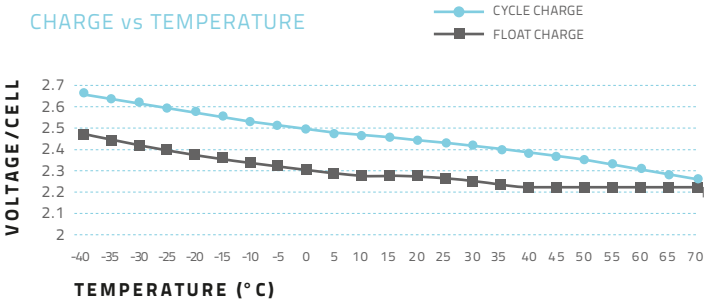
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		12 AH	
Dimension	Total Height (top of terminal) Height Length Width	100mm 94mm 151mm 99mm	3.93 " 3.7" 5.94" 3.9"
Weight		Approximately 4.15 kg / 9.14 lbs	
Capacity 25°C	120 hour rate (120mA) 20 hour rate (660mA) 10 hour rate (1.2A)	14.4 AH 13.2 AH 12 AH	
Internal Resistance	Fully charged Battery (25°C)	12mΩ	
Self-Discharge 25°C	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	95% 85% 80%	
Max Discharge Current 25°C	120A (5S)		
Terminal	Standard	F6	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 3.6A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

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 (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	44.04	23.30	14.08	10.27	8.27	4.74	3.44	2.70	2.30	1.96	1.49	1.24	1.04	0.68	0.55
1.67V	40.92	22.54	13.87	10.20	8.25	4.72	3.38	2.68	2.27	1.94	1.49	1.23	1.04	0.68	0.55
1.70V	40.51	22.20	13.73	10.06	8.19	4.68	3.36	2.67	2.23	1.92	1.48	1.23	1.04	0.67	0.55
1.75V	37.11	21.50	13.60	9.99	8.05	4.58	3.34	2.64	2.21	1.91	1.48	1.21	1.03	0.67	0.55
1.80V	33.29	20.11	13.04	9.71	7.84	4.52	3.33	2.63	2.18	1.89	1.47	1.20	1.03	0.65	0.55
1.83V	31.82	18.45	12.83	9.36	7.49	4.47	3.20	2.52	2.14	1.82	1.44	1.15	0.98	0.64	0.54
1.85V	29.82	17.89	12.00	9.02	7.28	4.29	3.11	2.48	2.08	1.76	1.42	1.14	0.97	0.63	0.54

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	73.58	40.92	26.35	19.21	15.45	8.95	6.54	5.18	4.38	3.76	2.90	2.40	2.02	1.35	1.10
1.67V	70.05	40.29	25.29	19.07	15.47	8.95	6.46	5.17	4.38	3.75	2.90	2.39	2.02	1.35	1.10
1.70V	69.63	40.02	25.28	19.07	15.33	8.88	6.44	5.15	4.31	3.72	2.88	2.37	2.00	1.34	1.10
1.75V	64.85	39.53	25.31	19.07	15.26	8.81	6.43	5.15	4.29	3.70	2.86	2.36	2.00	1.34	1.10
1.80V	59.51	37.52	24.76	18.73	15.19	8.81	6.42	5.13	4.27	3.70	2.86	2.34	2.00	1.30	1.10
1.83V	57.43	34.47	24.55	18.17	14.56	8.74	6.24	4.96	4.22	3.58	2.86	2.27	1.96	1.29	1.09
1.85V	53.19	33.71	22.82	17.48	14.15	8.53	6.07	4.90	4.10	3.51	2.75	2.25	1.93	1.28	1.08

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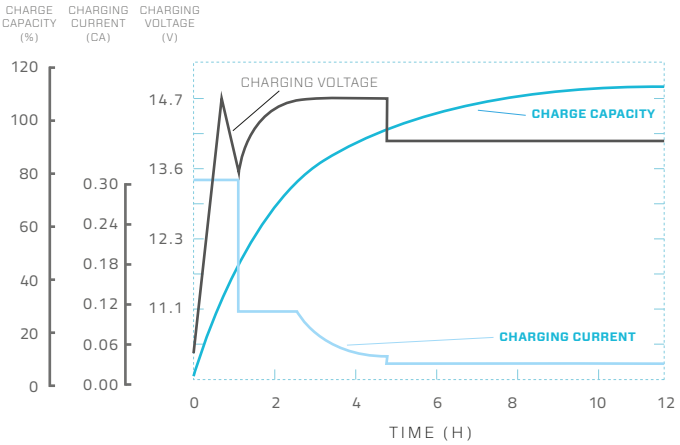
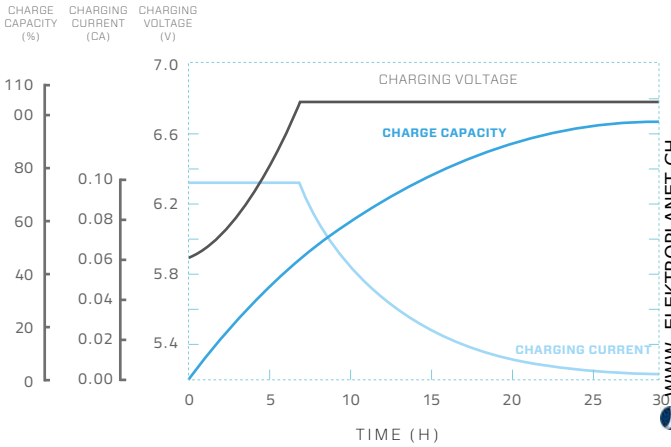
CYCLE CHARGE CHARACTERISTIC (25°C)

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



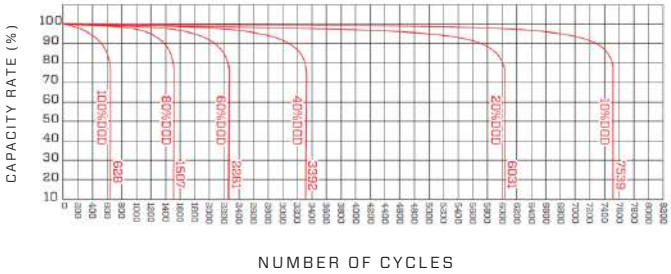
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

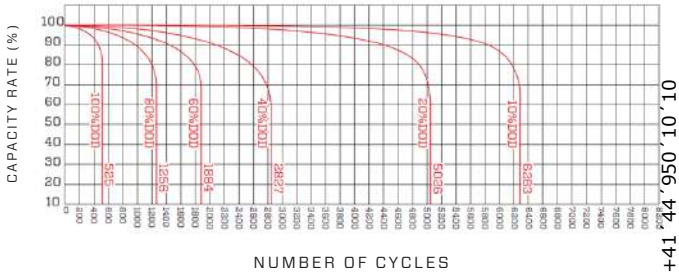


CYCLE LIFE CURVE GRAPH

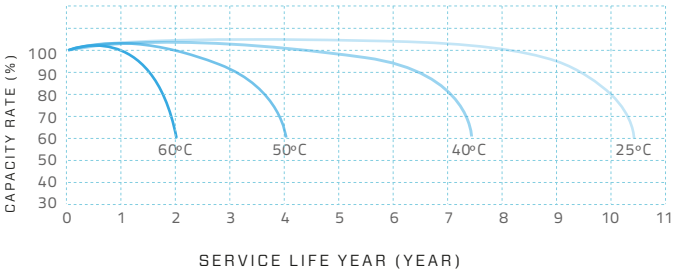
CYCLE LIFE CURVE GRAPH (25°C)



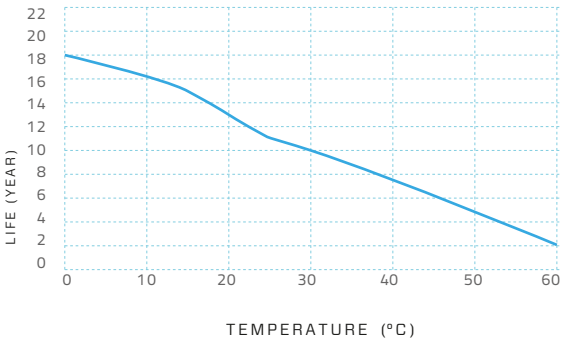
CYCLE LIFE CURVE GRAPH (40°C)



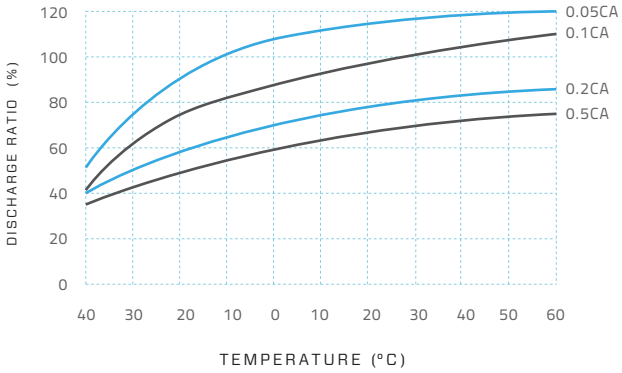
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

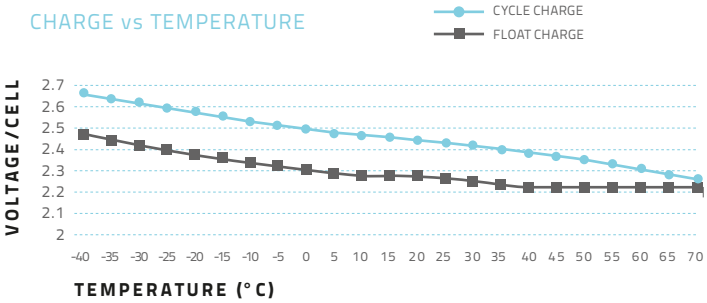
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		14 AH	
Dimension	Total Height (top of terminal)	104 mm	4.09"
	Height	98 mm	3.86"
	Length	151 mm	5.94"
	Width	99 mm	3.9"
Weight		Approximately 4.35 kg / 9.59 lbs	
Capacity 25°C	120 hour rate (141mA)	16.9 AH	
	20 hour rate (775A)	15.5 AH	
	10 hour rate (1.4A)	14 AH	
Internal Resistance	Fully charged Battery (25°C)	12mΩ	
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	120A (5S)		
Terminal	Standard	F6	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 4.2A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

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 (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	51.37	27.19	16.43	11.98	9.65	5.53	4.01	3.15	2.68	2.28	1.74	1.45	1.22	0.79	0.65
1.67V	47.75	26.30	16.18	11.89	9.63	5.50	3.94	3.13	2.65	2.27	1.74	1.43	1.21	0.79	0.64
1.70V	47.26	25.89	16.02	11.73	9.55	5.45	3.92	3.12	2.61	2.24	1.73	1.43	1.21	0.79	0.64
1.75V	43.29	25.08	15.86	11.65	9.39	5.35	3.90	3.08	2.58	2.23	1.72	1.42	1.20	0.78	0.64
1.80V	38.84	23.46	15.21	11.33	9.14	5.27	3.88	3.07	2.55	2.20	1.72	1.40	1.20	0.76	0.64
1.83V	37.13	21.53	14.97	10.93	8.74	5.22	3.73	2.94	2.49	2.12	1.68	1.34	1.15	0.75	0.63
1.85V	34.79	20.88	14.00	10.52	8.50	5.01	3.63	2.90	2.43	2.05	1.66	1.33	1.13	0.74	0.63

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	85.85	47.74	30.75	22.41	18.03	10.44	7.63	6.04	5.11	4.39	3.38	2.80	2.35	1.57	1.29
1.67V	81.72	47.01	29.50	22.25	18.04	10.44	7.53	6.04	5.11	4.38	3.38	2.79	2.35	1.57	1.29
1.70V	81.24	46.69	29.49	22.25	17.88	10.36	7.52	6.01	5.02	4.35	3.36	2.77	2.33	1.56	1.29
1.75V	75.65	46.12	29.52	22.25	17.80	10.28	7.50	6.00	5.01	4.31	3.34	2.75	2.33	1.56	1.28
1.80V	69.42	43.77	28.89	21.85	17.72	10.28	7.49	5.99	4.98	4.31	3.33	2.73	2.33	1.52	1.28
1.83V	67.00	40.21	28.64	21.20	16.99	10.20	7.28	5.79	4.92	4.18	3.33	2.65	2.29	1.51	1.27
1.85V	62.06	39.32	26.62	20.39	16.51	9.95	7.08	5.71	4.78	4.09	3.20	2.63	2.25	1.49	1.26

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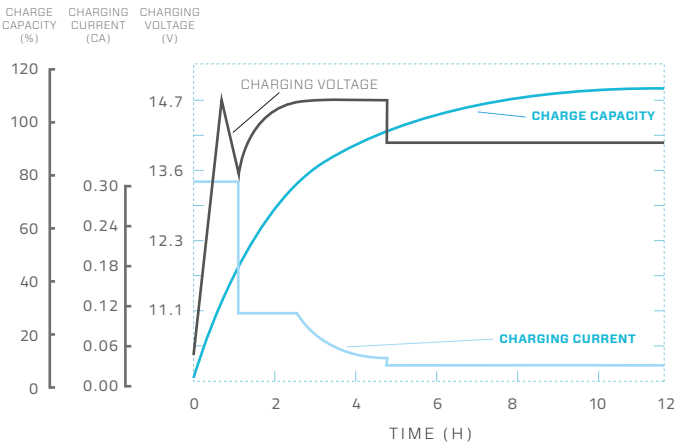
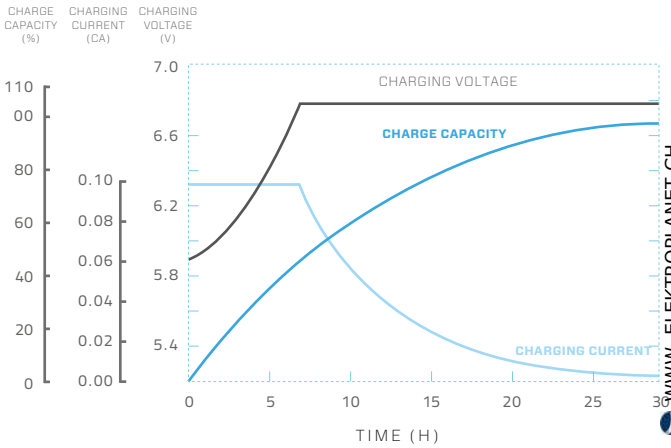
CYCLE CHARGE CHARACTERISTIC (25°C)

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



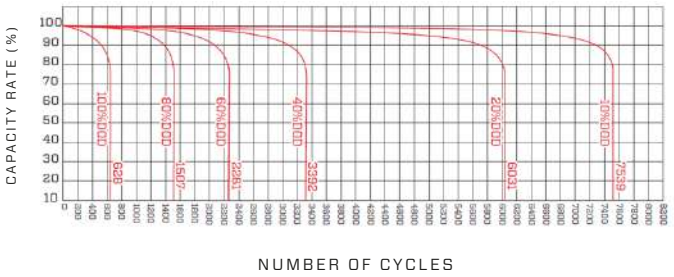
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

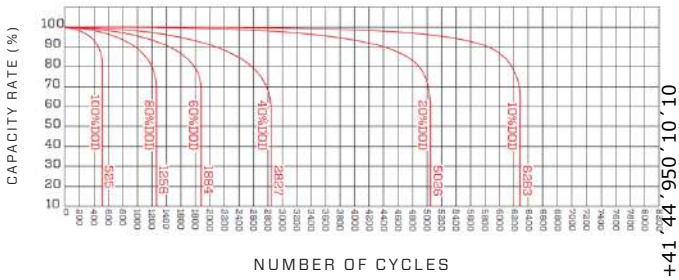


CYCLE LIFE CURVE GRAPH

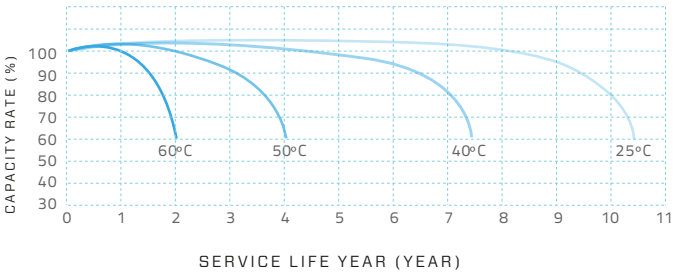
CYCLE LIFE CURVE GRAPH (25°C)



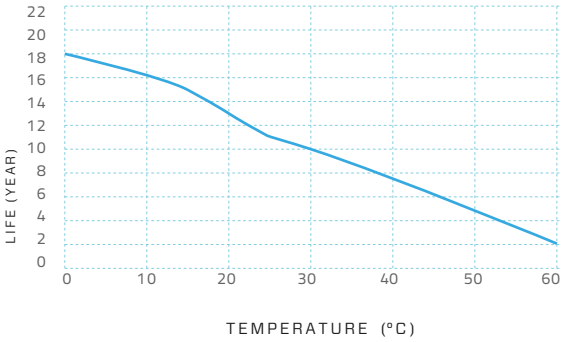
CYCLE LIFE CURVE GRAPH (40°C)



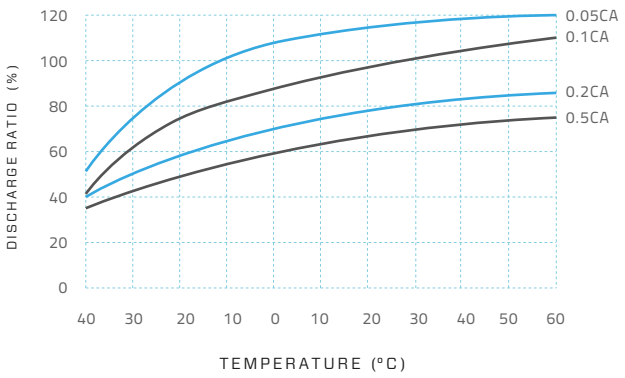
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

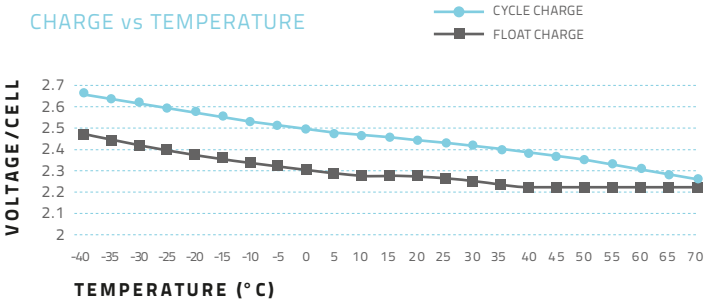
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		18 AH	
Dimension	Total Height (top of terminal)	170 mm	6.69"
	Height	170 mm	6.69"
	Length	181 mm	7.13
	Width	76 mm	2.99"
Weight		Approximately 5.9 kg /13 lbs	
Capacity 25°C	120 hour rate (200mA)	22 AH	
	20 hour rate (1.0A)	20 AH	
	10 hour rate (1.8A)	18 AH	
Internal Resistance	Fully charged Battery (25°C)	12mΩ	
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	180A (5S)		
Terminal	Standard	F5	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 5.4A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

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 (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	66.05	34.96	21.12	15.40	12.40	7.11	5.16	4.05	3.45	2.93	2.24	1.86	1.56	1.02	0.83
1.67V	61.39	33.81	20.81	15.29	12.38	7.08	5.07	4.03	3.40	2.91	2.23	1.84	1.56	1.01	0.83
1.70V	60.76	33.29	20.60	15.09	12.28	7.01	5.04	4.01	3.35	2.88	2.23	1.84	1.56	1.01	0.83
1.75V	55.66	32.25	20.39	14.98	12.07	6.88	5.01	3.96	3.32	2.86	2.22	1.82	1.55	1.01	0.83
1.80V	49.94	30.17	19.56	14.57	11.76	6.77	4.99	3.94	3.28	2.83	2.21	1.80	1.54	0.97	0.82
1.83V	47.74	27.68	19.25	14.05	11.24	6.71	4.80	3.78	3.20	2.73	2.16	1.73	1.48	0.96	0.81
1.85V	44.73	26.84	18.00	13.53	10.92	6.44	4.67	3.72	3.12	2.64	2.13	1.71	1.46	0.95	0.81

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	110.38	61.38	39.53	28.82	23.18	13.42	9.81	7.77	6.56	5.64	4.35	3.60	3.03	2.02	1.65
1.67V	105.07	60.44	37.93	28.61	23.20	13.42	9.69	7.76	6.56	5.63	4.35	3.59	3.03	2.02	1.65
1.70V	104.45	60.03	37.92	28.61	22.99	13.32	9.66	7.73	6.46	5.59	4.32	3.56	3.00	2.01	1.65
1.75V	97.27	59.30	37.96	28.61	22.89	13.21	9.64	7.72	6.44	5.54	4.30	3.53	3.00	2.01	1.64
1.80V	89.26	56.28	37.14	28.09	22.78	13.21	9.63	7.70	6.40	5.54	4.29	3.52	3.00	1.96	1.64
1.83V	86.14	51.70	36.83	27.26	21.85	13.11	9.36	7.44	6.33	5.37	4.29	3.41	2.94	1.94	1.63
1.85V	79.79	50.56	34.23	26.22	21.22	12.80	9.10	7.34	6.15	5.26	4.12	3.38	2.89	1.91	1.62

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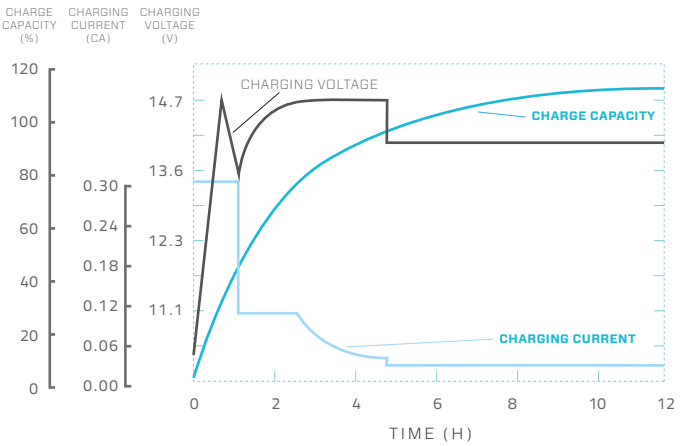
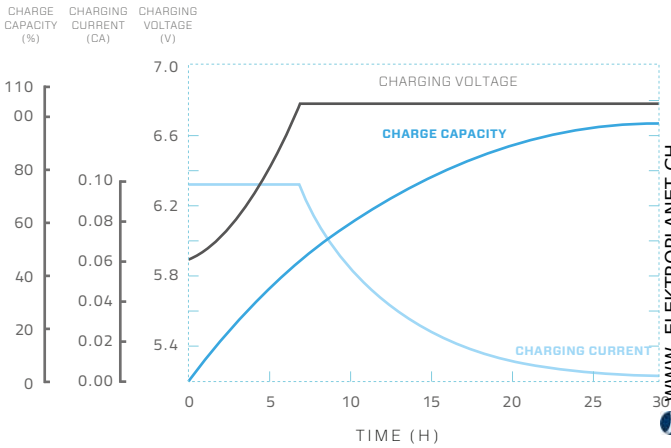
CYCLE CHARGE CHARACTERISTIC (25°C)

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



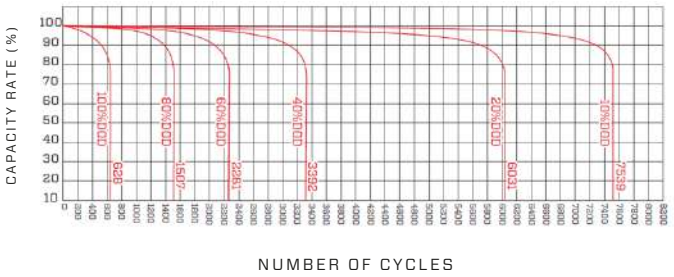
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

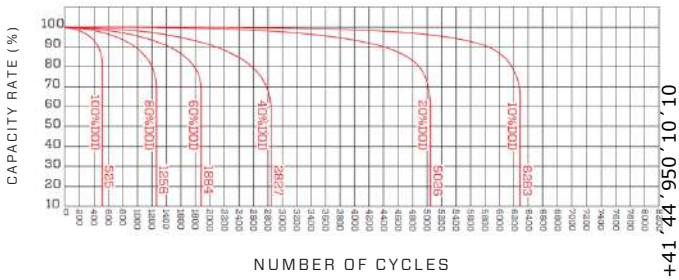


CYCLE LIFE CURVE GRAPH

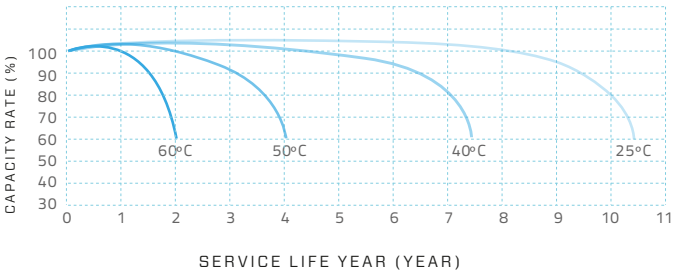
CYCLE LIFE CURVE GRAPH (25°C)



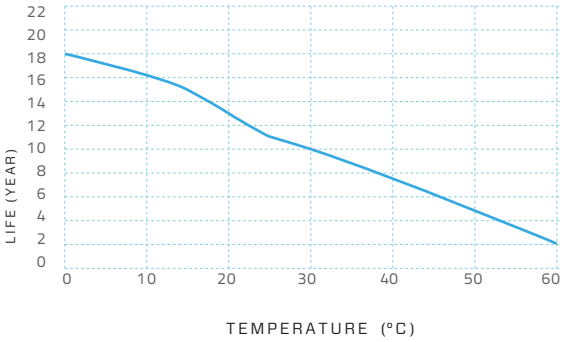
CYCLE LIFE CURVE GRAPH (40°C)



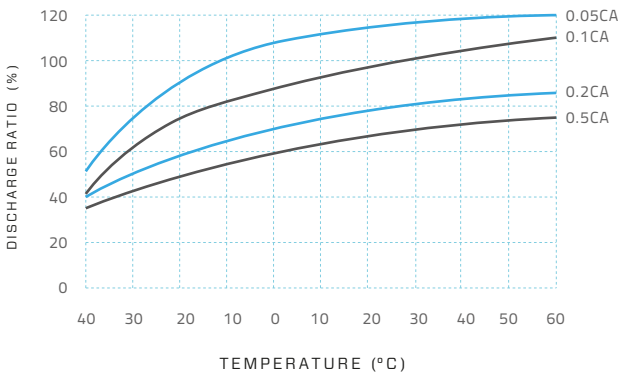
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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INDUSTRIESTRASSE 2
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LEAD CRYSTAL® BATTERIES

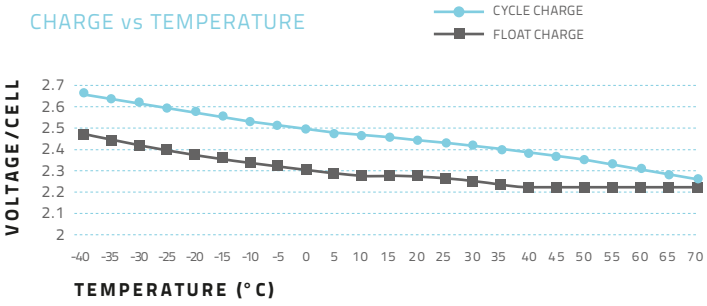
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		22 AH	
Dimension	Total Height (top of terminal)	170 mm	6.69"
	Height	170 mm	6.69"
	Length	181 mm	7.13"
	Width	76 mm	2.99"
Weight		Approximately 6.9 kg / 15.21 lbs	
Capacity 25°C	120 hour rate (220mA)	26.4 AH	
	20 hour rate (1.2A)	24AH	
	10 hour rate (2.2A)	22AH	
Internal Resistance	Fully charged Battery (25°C)	10mΩ	
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	220A(5S)		
Terminal	Standard	F5	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 6.6A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	80.73	42.72	25.81	18.82	15.16	8.68	6.31	4.95	4.22	3.59	2.73	2.28	1.91	1.24	1.02
1.67V	75.03	41.32	25.43	18.69	15.13	8.65	6.19	4.92	4.16	3.56	2.73	2.25	1.91	1.24	1.01
1.70V	74.26	40.69	25.18	18.44	15.01	8.57	6.15	4.90	4.09	3.52	2.72	2.25	1.90	1.24	1.01
1.75V	68.03	39.42	24.93	18.31	14.75	8.41	6.13	4.83	4.06	3.50	2.71	2.23	1.89	1.23	1.01
1.80V	61.04	36.87	23.91	17.80	14.37	8.28	6.10	4.82	4.01	3.46	2.70	2.20	1.88	1.19	1.01
1.83V	58.34	33.83	23.53	17.17	13.73	8.20	5.86	4.62	3.92	3.33	2.64	2.11	1.81	1.18	0.99
1.85V	54.67	32.81	22.00	16.53	13.35	7.87	5.71	4.55	3.82	3.22	2.61	2.09	1.78	1.16	0.99

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	134.90	75.02	48.32	35.22	28.33	16.40	11.99	9.50	8.02	6.89	5.31	4.40	3.70	2.47	2.02
1.67V	128.42	73.87	46.36	34.97	28.35	16.40	11.84	9.49	8.02	6.88	5.31	4.39	3.70	2.47	2.02
1.70V	127.66	73.37	46.34	34.97	28.10	16.28	11.81	9.45	7.90	6.83	5.28	4.35	3.66	2.45	2.02
1.75V	118.88	72.47	46.39	34.97	27.97	16.15	11.79	9.43	7.87	6.78	5.25	4.32	3.66	2.45	2.01
1.80V	109.10	68.79	45.39	34.33	27.85	16.15	11.77	9.41	7.82	6.78	5.24	4.30	3.66	2.39	2.01
1.83V	105.28	63.19	45.01	33.31	26.70	16.02	11.44	9.09	7.73	6.56	5.24	4.17	3.60	2.37	2.00
1.85V	97.52	61.79	41.83	32.04	25.94	15.64	11.13	8.98	7.51	6.43	5.04	4.13	3.53	2.34	1.98

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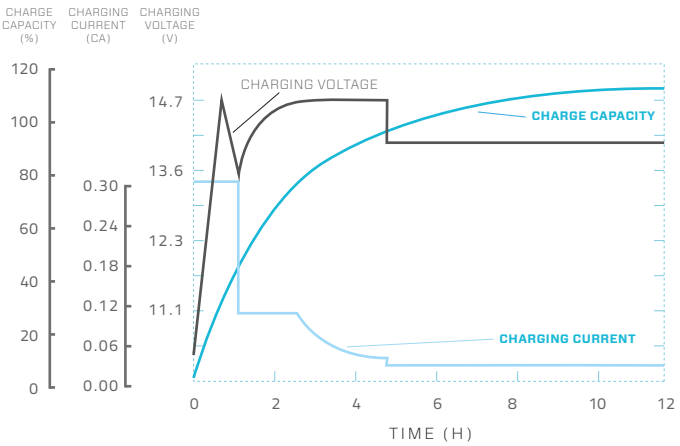
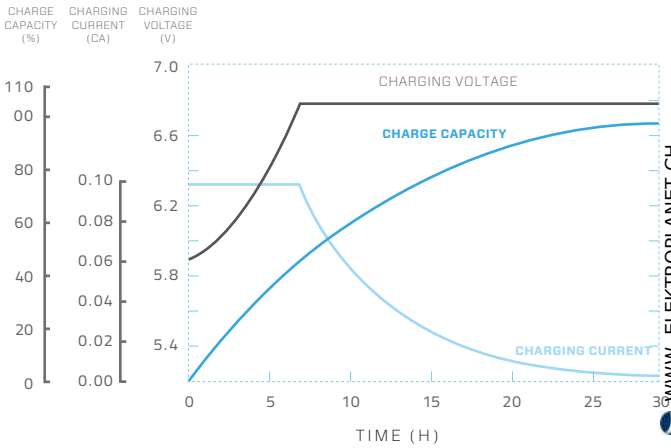
CYCLE CHARGE CHARACTERISTIC (25°C)

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



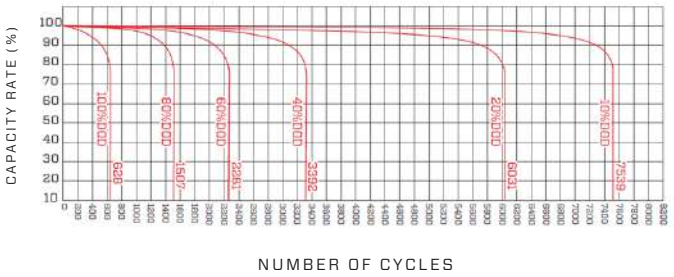
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

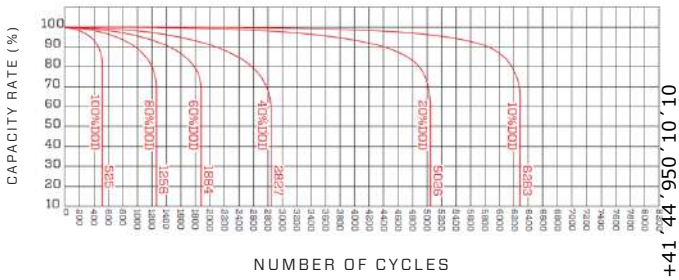


CYCLE LIFE CURVE GRAPH

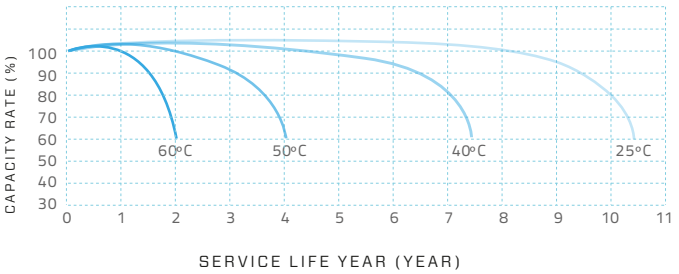
CYCLE LIFE CURVE GRAPH (25°C)



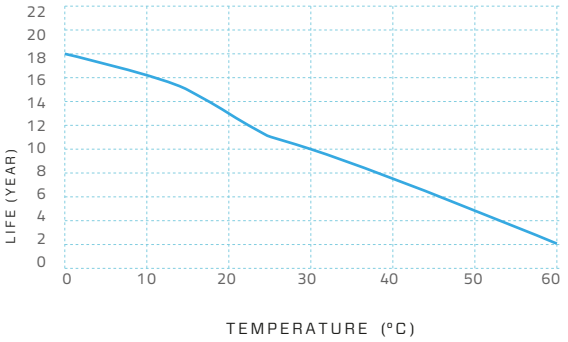
CYCLE LIFE CURVE GRAPH (40°C)



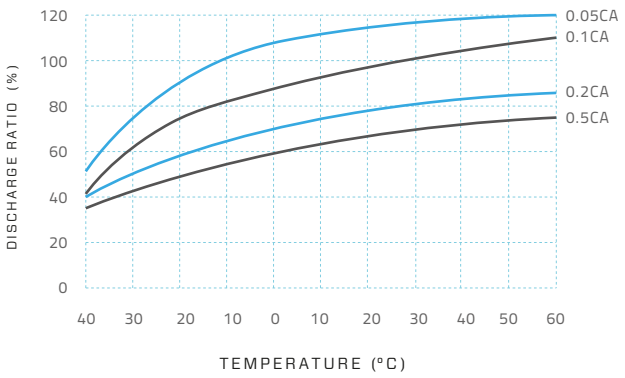
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

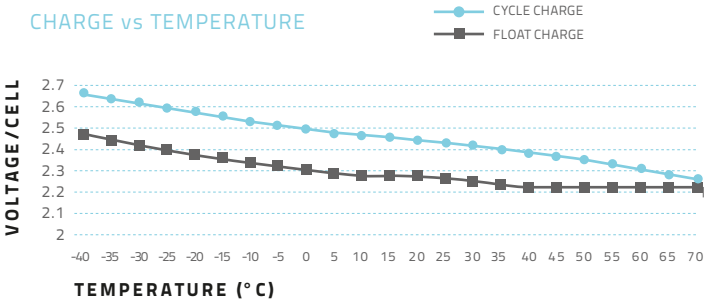
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		24 AH	
Dimension	Total Height (top of terminal)	125 mm	4.92"
	Height	125mm	4.92"
	Length	176 mm	6.93"
	Width	166 mm	6.54"
Weight		Approximately 7.7 kg / 16.97 lbs	
Capacity 25°C	120 hour rate (0.24A)	29 AH	
	20 hour rate (1.35A)	27 AH	
	10 hour rate (2.4A)	24AH	
Internal Resistance	Fully charged Battery (25°C)	8.5mΩ	
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	240A (5S)		
Terminal	Standard	F5	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 7.2A 14.7V/ (25°C)	
	Float	13.6V/ (25°C)	

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 (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	88.07	46.61	28.16	20.53	16.54	9.47	6.88	5.40	4.60	3.91	2.98	2.48	2.08	1.36	1.11
1.67V	81.85	45.08	27.74	20.39	16.51	9.43	6.76	5.37	4.54	3.88	2.98	2.46	2.08	1.35	1.10
1.70V	81.01	44.39	27.47	20.12	16.37	9.35	6.71	5.34	4.47	3.84	2.97	2.46	2.07	1.35	1.10
1.75V	74.22	43.00	27.19	19.98	16.09	9.17	6.69	5.27	4.43	3.82	2.95	2.43	2.06	1.34	1.10
1.80V	66.59	40.22	26.08	19.42	15.68	9.03	6.66	5.26	4.37	3.77	2.94	2.40	2.05	1.30	1.10
1.83V	63.65	36.90	25.67	18.73	14.98	8.95	6.40	5.04	4.27	3.63	2.88	2.30	1.97	1.28	1.08
1.85V	59.64	35.79	24.00	18.04	14.57	8.59	6.23	4.97	4.16	3.51	2.84	2.28	1.94	1.27	1.08

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	147.17	81.84	52.71	38.42	30.91	17.89	13.08	10.36	8.75	7.52	5.80	4.80	4.04	2.69	2.21
1.67V	140.10	80.59	50.58	38.15	30.93	17.89	12.91	10.35	8.75	7.50	5.80	4.79	4.04	2.69	2.21
1.70V	139.26	80.03	50.55	38.15	30.65	17.75	12.89	10.31	8.61	7.45	5.76	4.74	3.99	2.68	2.21
1.75V	129.69	79.06	50.61	38.14	30.52	17.62	12.86	10.29	8.59	7.39	5.73	4.71	3.99	2.68	2.19
1.80V	119.01	75.04	49.52	37.45	30.38	17.62	12.84	10.26	8.53	7.39	5.71	4.69	3.99	2.61	2.19
1.83V	114.85	68.94	49.10	36.34	29.13	17.48	12.48	9.92	8.43	7.16	5.71	4.55	3.93	2.58	2.18
1.85V	106.39	67.41	45.64	34.96	28.30	17.06	12.14	9.79	8.20	7.02	5.49	4.51	3.86	2.55	2.16

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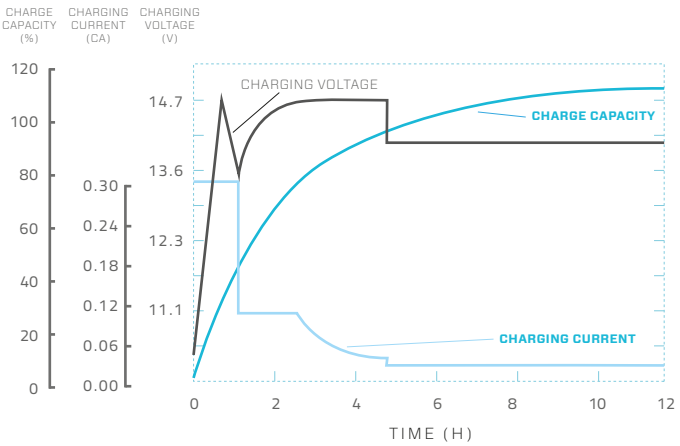
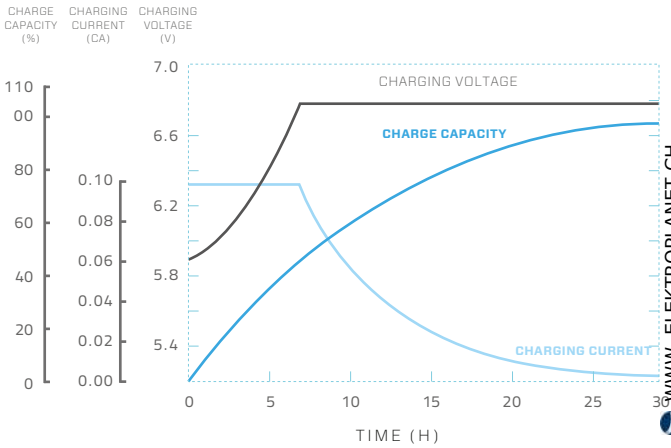
CYCLE CHARGE CHARACTERISTIC (25°C)

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



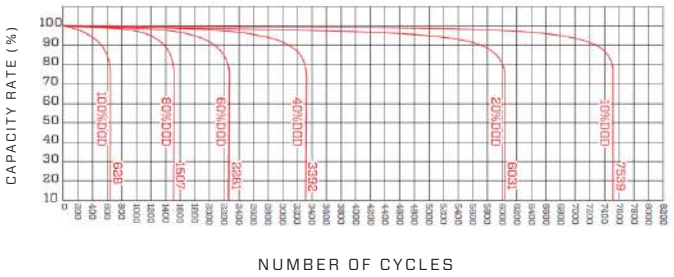
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

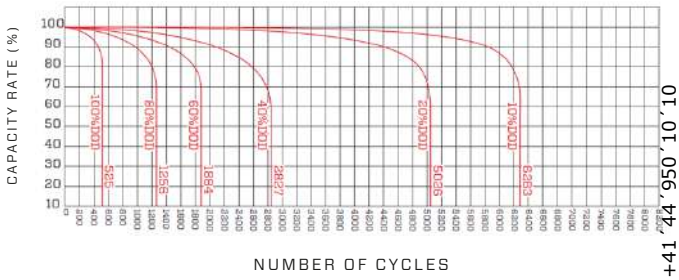


CYCLE LIFE CURVE GRAPH

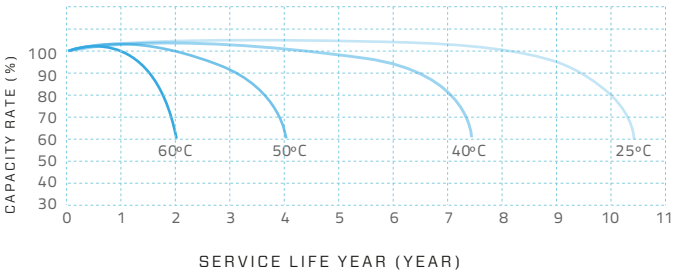
CYCLE LIFE CURVE GRAPH (25°C)



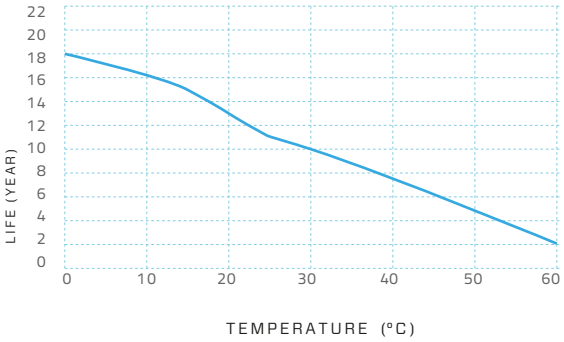
CYCLE LIFE CURVE GRAPH (40°C)



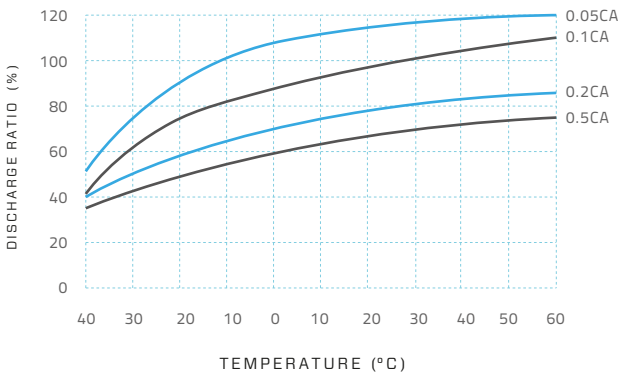
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

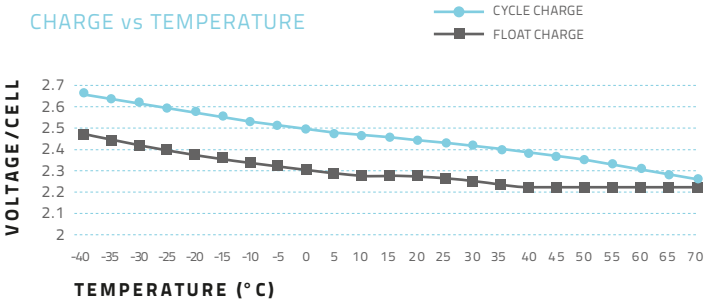
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		26 AH	
Dimension	Total Height (top of terminal) Height Length Width	125mm 125mm 176mm 166mm	4.92" 4.92 " 6.93" 6.54"
Weight		Approximately 7.8 kg / 17.19 lbs	
Capacity 25°C	120 hour rate (0.25A) 20 hour rate (1.45A) 10 hour rate (2.6A)	31AH 29AH 26AH	
Internal Resistance	Fully charged Battery (25°C)	8.5mΩ	
Self-Discharge 25°C	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	95% 85% 80%	
Max Discharge Current 25°C	260A(5S)		
Terminal	Standard	F5	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 7.8A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	95.41	50.49	30.51	22.24	17.91	10.26	7.45	5.85	4.99	4.24	3.23	2.69	2.26	1.47	1.20
1.67V	88.67	48.84	30.06	22.09	17.88	10.22	7.32	5.82	4.91	4.21	3.23	2.66	2.25	1.47	1.20
1.70V	87.77	48.09	29.75	21.79	17.73	10.13	7.27	5.79	4.84	4.16	3.22	2.66	2.25	1.46	1.19
1.75V	80.40	46.58	29.46	21.64	17.43	9.93	7.24	5.71	4.79	4.13	3.20	2.63	2.24	1.45	1.19
1.80V	72.13	43.58	28.25	21.04	16.98	9.78	7.21	5.70	4.73	4.09	3.19	2.60	2.22	1.41	1.19
1.83V	68.95	39.98	27.80	20.29	16.23	9.69	6.93	5.46	4.63	3.94	3.12	2.49	2.13	1.39	1.17
1.85V	64.62	38.77	26.00	19.54	15.78	9.30	6.75	5.38	4.51	3.81	3.08	2.46	2.10	1.38	1.16

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	159.43	88.66	57.10	41.62	33.48	19.38	14.17	11.23	9.48	8.14	6.28	5.20	4.37	2.92	2.39
1.67V	151.77	87.31	54.79	41.32	33.51	19.38	13.99	11.21	9.48	8.13	6.28	5.18	4.37	2.92	2.39
1.70V	150.87	86.70	54.77	41.32	33.21	19.23	13.96	11.17	9.33	8.07	6.24	5.14	4.33	2.90	2.39
1.75V	140.50	85.65	54.83	41.32	33.06	19.08	13.93	11.15	9.30	8.01	6.21	5.10	4.33	2.90	2.37
1.80V	128.93	81.29	53.65	40.57	32.91	19.08	13.91	11.12	9.24	8.01	6.19	5.08	4.33	2.83	2.37
1.83V	124.42	74.68	53.20	39.37	31.56	18.93	13.52	10.74	9.14	7.75	6.19	4.93	4.25	2.80	2.36
1.85V	115.25	73.03	49.44	37.87	30.65	18.48	13.15	10.61	8.88	7.60	5.95	4.88	4.18	2.76	2.34

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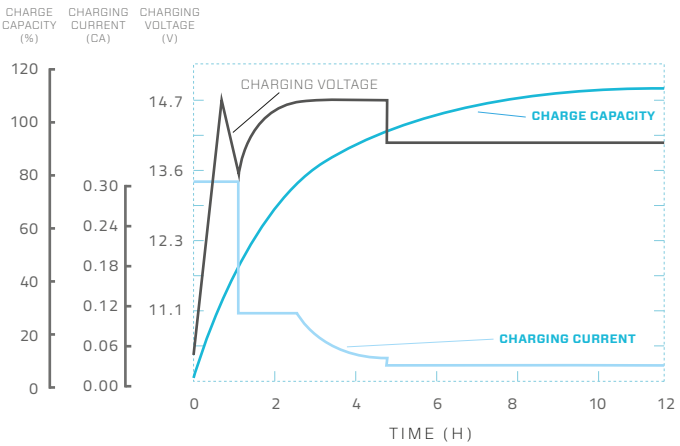
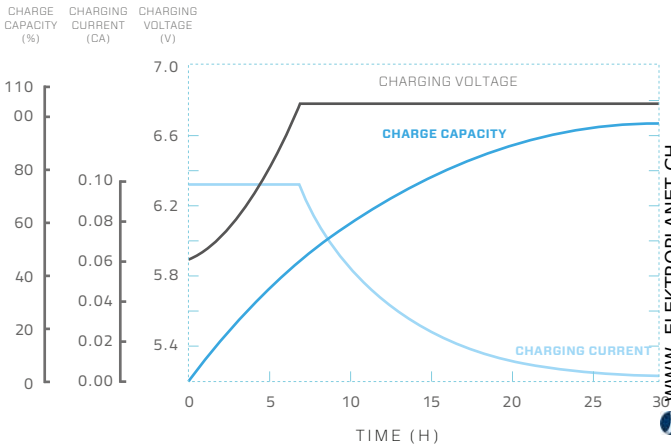
CYCLE CHARGE CHARACTERISTIC (25°C)

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



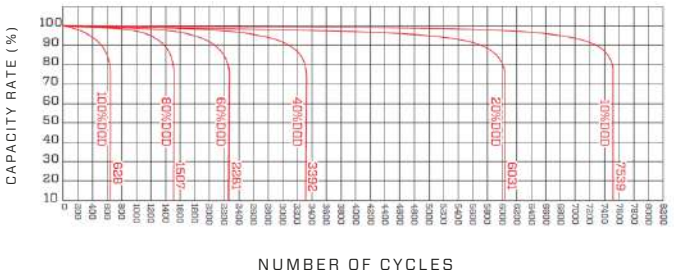
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

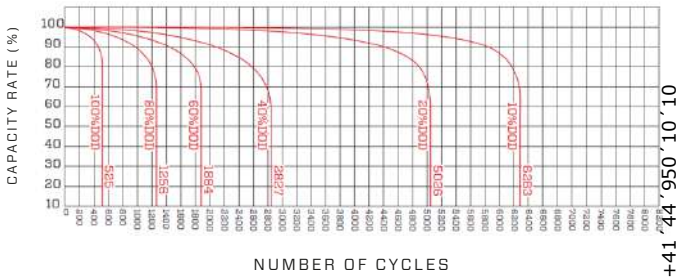


CYCLE LIFE CURVE GRAPH

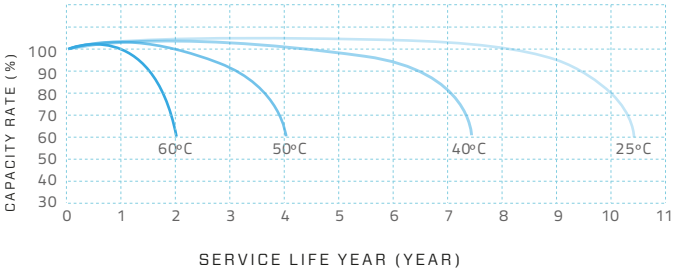
CYCLE LIFE CURVE GRAPH (25°C)



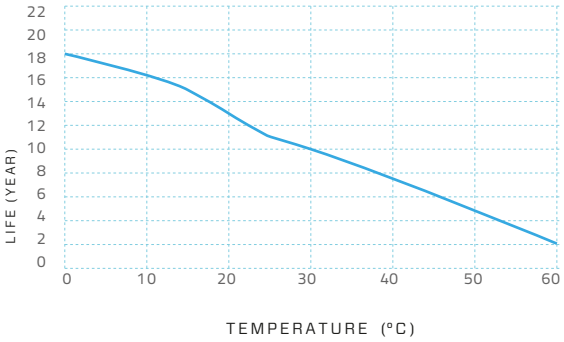
CYCLE LIFE CURVE GRAPH (40°C)



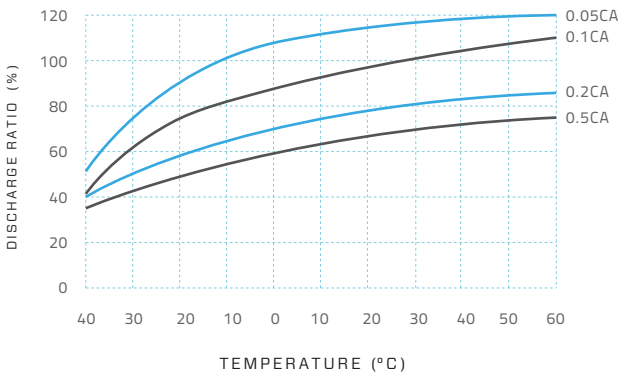
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

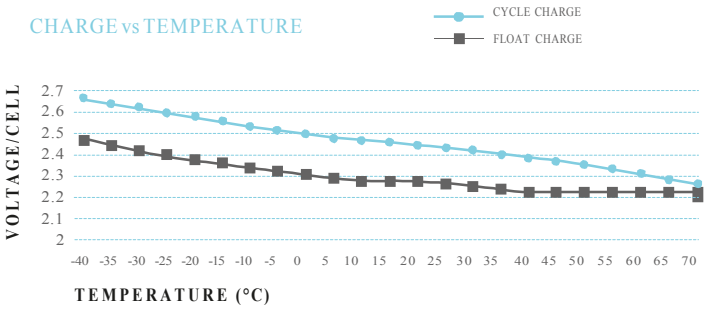
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		28 AH	
Dimension	Total Height (top of terminal)	125mm	4.92"
	Height	125mm	4.92 "
	Length	176mm	6.932"
	Width	166mm	6.54"
Weight		Approximately 9 kg / 19.82 lbs	
Capacity 25ºC	120 hour rate (0.28A)	33.6AH	
	20 hour rate (1.6A)	32AH	
	10 hour rate (2.8A)	28AH	
Internal Resistance	Fully charged Battery (25ºC)	8m	
Self-Discharge 25ºC	Capacity after 3 month storage	95%	
	Capacity after 6 month storage	85%	
	Capacity after 12 month storage	80%	
Max Discharge Current 25ºC	280A(5S)		
Terminal	Standard	F5	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 8.4A 14.7V/(25□)	
	Float	13.6V/(25□)	

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 (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	102.75	54.38	32.86	23.95	19.29	11.05	8.03	6.30	5.37	4.56	3.48	2.90	2.43	1.58	1.29
1.67V	95.49	52.60	32.37	23.79	19.26	11.01	7.88	6.26	5.29	4.53	3.48	2.86	2.43	1.58	1.29
1.70V	94.52	51.79	32.04	23.47	19.10	10.91	7.83	6.23	5.21	4.48	3.46	2.86	2.42	1.57	1.29
1.75V	86.59	50.16	31.72	23.31	18.77	10.70	7.80	6.15	5.16	4.45	3.45	2.83	2.41	1.57	1.29
1.80V	77.68	46.93	30.42	22.66	18.29	10.54	7.77	6.13	5.10	4.40	3.43	2.80	2.40	1.51	1.28
1.83V	74.26	43.05	29.94	21.85	17.48	10.44	7.46	5.88	4.99	4.24	3.36	2.69	2.30	1.50	1.27
1.85V	69.59	41.75	28.00	21.04	16.99	10.02	7.27	5.79	4.86	4.10	3.32	2.65	2.27	1.48	1.25

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	171.69	95.48	61.49	44.83	36.06	20.88	15.26	12.09	10.21	8.77	6.76	5.60	4.71	3.14	2.57
1.67V	163.44	94.02	59.01	44.50	36.09	20.88	15.07	12.07	10.21	8.75	6.76	5.58	4.71	3.14	2.57
1.70V	162.47	93.37	58.98	44.50	35.76	20.71	15.03	12.03	10.05	8.69	6.72	5.53	4.66	3.12	2.57
1.75V	151.31	92.24	59.05	44.50	35.60	20.55	15.00	12.01	10.02	8.63	6.68	5.50	4.66	3.12	2.56
1.80V	138.85	87.55	57.77	43.69	35.44	20.55	14.99	11.98	9.95	8.63	6.67	5.47	4.66	3.04	2.56
1.83V	133.99	80.43	57.29	42.40	33.98	20.39	14.56	11.57	9.84	8.35	6.67	5.31	4.58	3.01	2.54
1.85V	124.12	78.65	53.24	40.78	33.01	19.90	14.16	11.43	9.56	8.19	6.41	5.26	4.50	2.98	2.52

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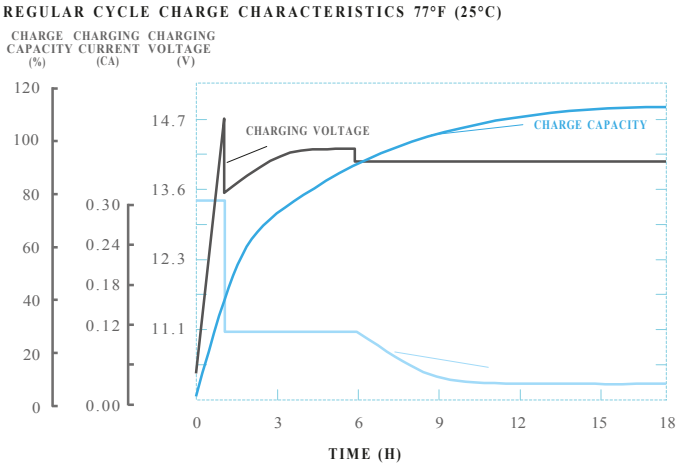
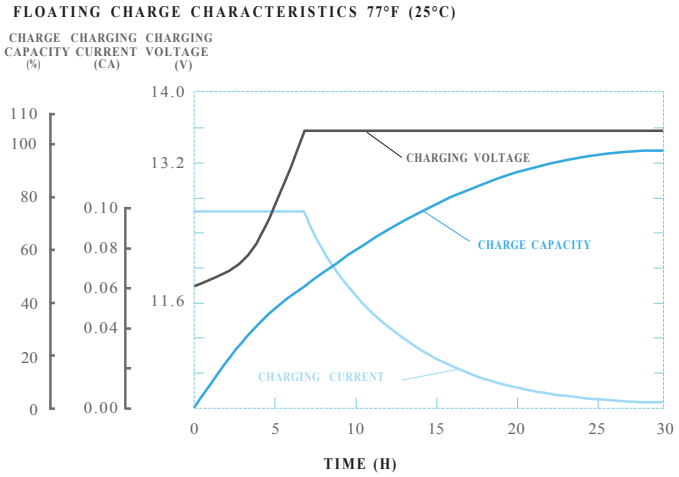
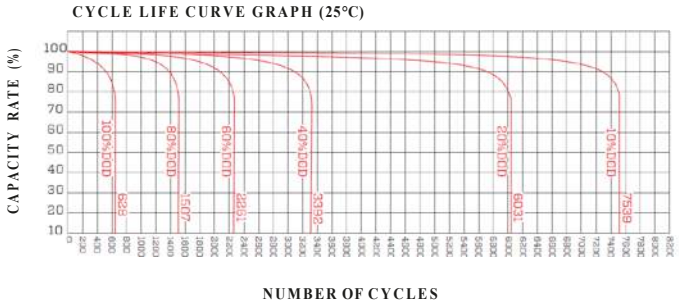
CYCLE CHARGE CHARACTERISTIC (25°C)

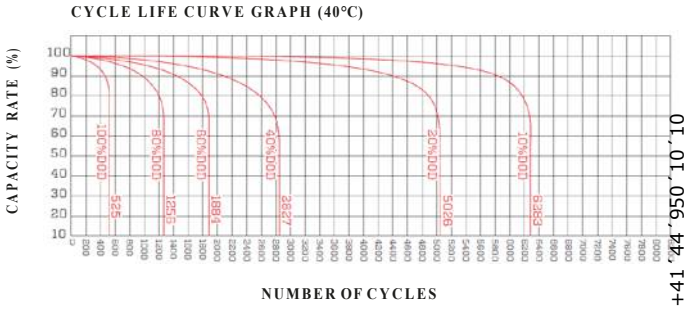


FLOATING CHARGE CHARACTERISTIC (25°C)

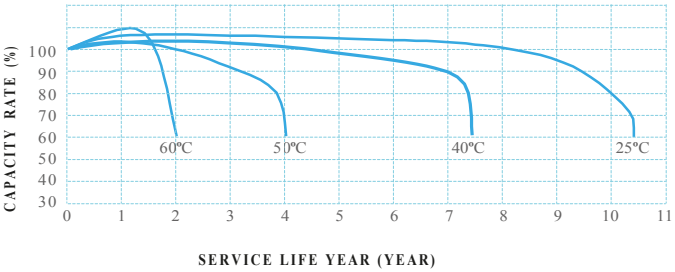


CYCLE LIFE CURVE GRAPH

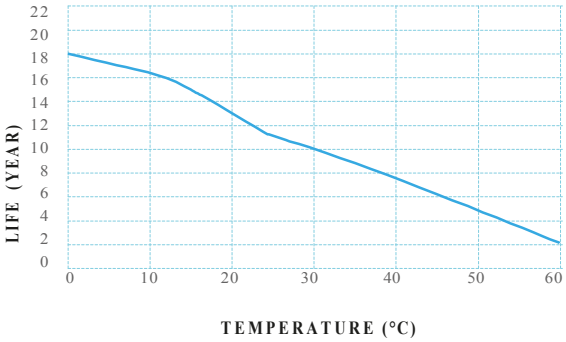




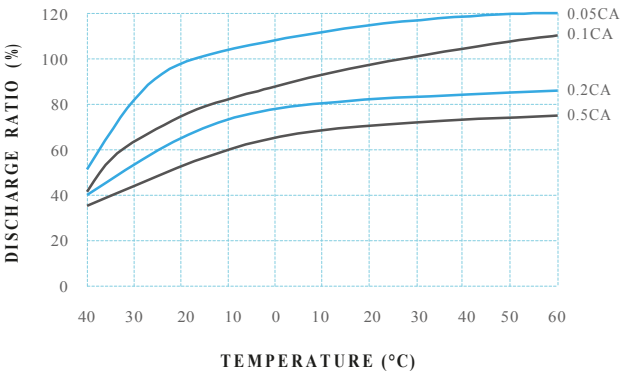
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

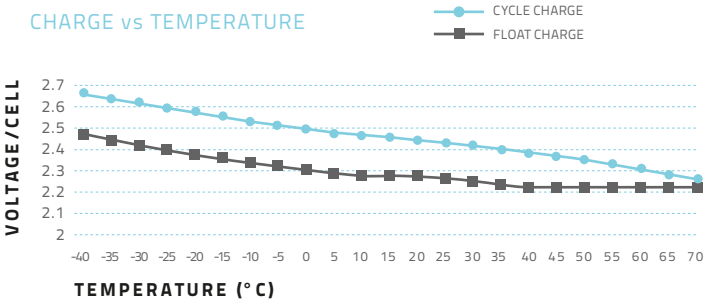
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		35 AH	
Dimension	Total Height (top of terminal)	170 mm	6.69 "
	Height	170 mm	6.69 "
	Length	194 mm	7.64 "
	Width	132 mm	5.20 "
Weight		Approximately 12 kg / 26,46 lbs	
Capacity 25°C	120 hour rate(0.35A)	42AH	
	20 hour rate(2A)	40AH	
	10 hour rate(3.5A)	35AH	
Internal Resistance	Fully charged Battery (25°C)	8mΩ	
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	350A(5S)		
Terminal	Standard	F3	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 10.5A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	128.44	67.97	41.07	29.94	24.12	13.82	10.03	7.87	6.71	5.71	4.35	3.62	3.04	1.98	1.62
1.67V	119.36	65.74	40.46	29.74	24.07	13.76	9.85	7.83	6.62	5.66	4.34	3.58	3.03	1.97	1.61
1.70V	118.15	64.74	40.05	29.33	23.87	13.64	9.79	7.79	6.51	5.60	4.33	3.58	3.02	1.97	1.61
1.75V	108.23	62.71	39.66	29.13	23.47	13.37	9.75	7.69	6.45	5.56	4.31	3.54	3.01	1.96	1.61
1.80V	97.10	58.66	38.03	28.32	22.86	13.17	9.71	7.67	6.37	5.50	4.29	3.50	2.99	1.89	1.60
1.83V	92.82	53.82	37.43	27.31	21.85	13.05	9.33	7.34	6.23	5.30	4.20	3.36	2.87	1.87	1.58
1.85V	86.98	52.19	35.00	26.30	21.24	12.52	9.08	7.24	6.07	5.13	4.15	3.32	2.83	1.85	1.57

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	214.62	119.35	76.87	56.03	45.08	26.09	19.08	15.11	12.76	10.96	8.46	7.00	5.89	3.92	3.22
1.67V	204.31	117.53	73.76	55.63	45.11	26.09	18.83	15.09	12.76	10.94	8.46	6.98	5.89	3.92	3.22
1.70V	203.09	116.72	73.72	55.63	44.70	25.89	18.79	15.03	12.56	10.86	8.39	6.92	5.83	3.90	3.22
1.75V	189.13	115.30	73.81	55.63	44.50	25.69	18.75	15.01	12.52	10.78	8.35	6.87	5.83	3.90	3.20
1.80V	173.56	109.43	72.22	54.62	44.30	25.69	18.73	14.97	12.44	10.78	8.33	6.84	5.83	3.80	3.20
1.83V	167.49	100.53	71.61	53.00	42.48	25.49	18.21	14.46	12.30	10.44	8.33	6.63	5.72	3.76	3.18
1.85V	155.15	98.31	66.55	50.98	41.27	24.88	17.70	14.28	11.96	10.24	8.01	6.57	5.62	3.72	3.16

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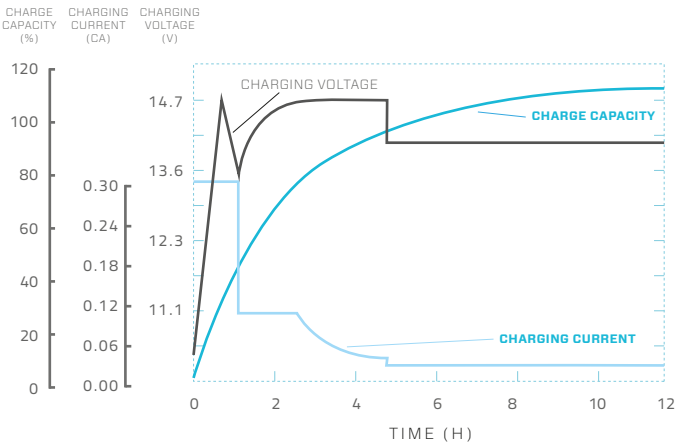
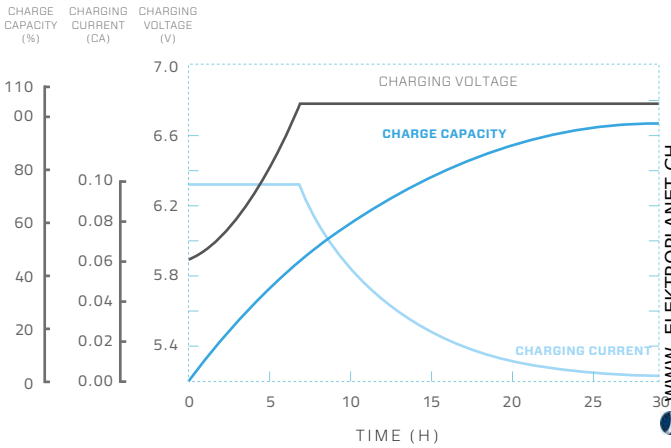
CYCLE CHARGE CHARACTERISTIC (25°C)

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



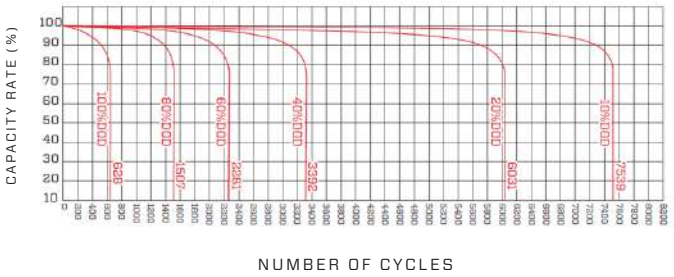
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

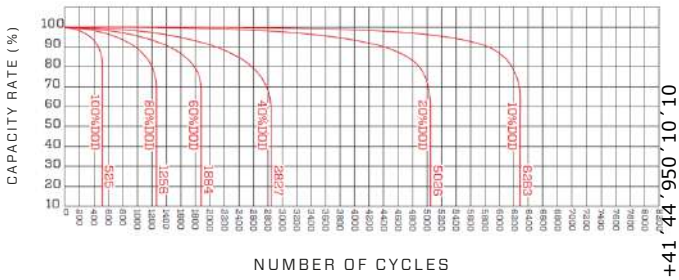


CYCLE LIFE CURVE GRAPH

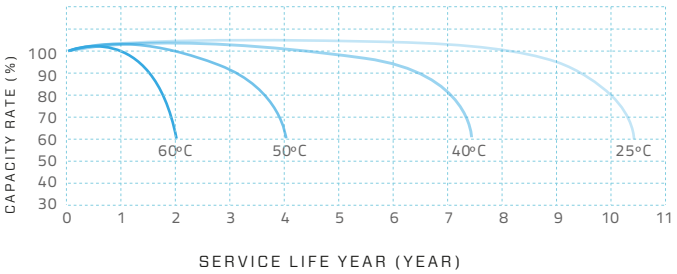
CYCLE LIFE CURVE GRAPH (25°C)



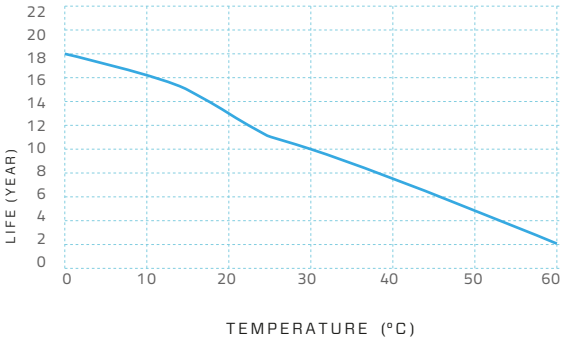
CYCLE LIFE CURVE GRAPH (40°C)



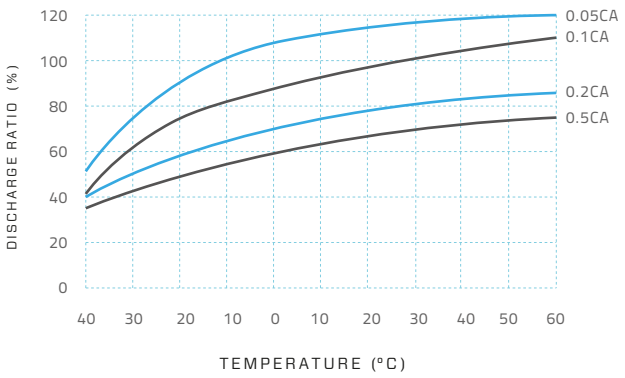
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

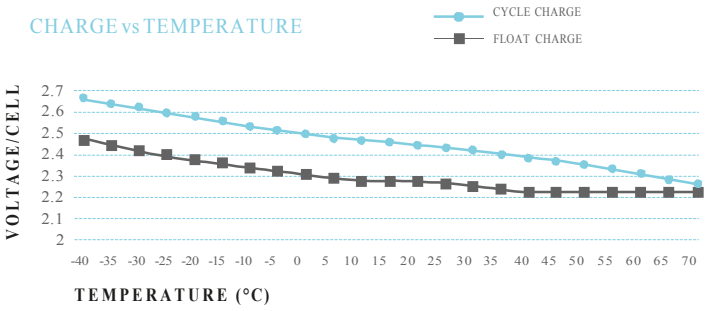
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		40 AH	
Dimension	Total Height (top of terminal)	172mm	6.77"
	Height	172mm	6.77"
	Length	198mm	7.8"
	Width	166mm	6.54"
Weight		Approximately 14.5kg/31.94lbs	
Capacity 25ºC	120 hour rate(0.4A)	48AH	
	20 hour rate(2.2A)	44AH	
	10 hour rate(4A)	40AH	
Internal Resistance	Fully charged Battery (25ºC)	8m	
Self-Discharge 25ºC	Capacity after 3 month storage	95%	
	Capacity after 6 month storage	85%	
	Capacity after 12 month storage	80%	
Max Discharge Current 25ºC	400A (5S)		
Terminal	Standard	F3	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 12A 14.7V/(25□)	
	Float	13.6V/(25□)	

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 (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	146.78	77.68	46.94	34.22	27.56	15.79	11.47	8.99	7.67	6.52	4.97	4.14	3.47	2.26	1.85
1.67V	136.42	75.14	46.24	33.98	27.51	15.72	11.26	8.95	7.56	6.47	4.96	4.09	3.47	2.25	1.84
1.70V	135.02	73.98	45.78	33.53	27.28	15.58	11.19	8.90	7.44	6.40	4.95	4.09	3.46	2.25	1.84
1.75V	123.70	71.66	45.32	33.30	26.82	15.28	11.14	8.79	7.38	6.36	4.92	4.05	3.44	2.24	1.84
1.80V	110.98	67.04	43.46	32.37	26.13	15.05	11.10	8.76	7.28	6.29	4.90	4.00	3.42	2.16	1.83
1.83V	106.08	61.50	42.78	31.22	24.97	14.91	10.66	8.39	7.12	6.06	4.80	3.84	3.28	2.14	1.81
1.85V	99.41	59.65	40.00	30.06	24.28	14.31	10.38	8.28	6.94	5.86	4.74	3.79	3.24	2.12	1.79

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	245.28	136.40	87.85	64.04	51.51	29.82	21.80	17.27	14.59	12.53	9.66	8.00	6.73	4.49	3.68
1.67V	233.49	134.32	84.30	63.58	51.55	29.82	21.52	17.25	14.59	12.51	9.66	7.98	6.73	4.48	3.68
1.70V	232.10	133.39	84.26	63.58	51.09	29.59	21.48	17.18	14.36	12.41	9.59	7.91	6.66	4.46	3.68
1.75V	216.15	131.77	84.35	63.57	50.86	29.36	21.43	17.15	14.31	12.32	9.55	7.85	6.66	4.46	3.65
1.80V	198.36	125.07	82.53	62.42	50.63	29.36	21.41	17.11	14.22	12.32	9.52	7.81	6.66	4.35	3.65
1.83V	191.42	114.90	81.84	60.57	48.55	29.13	20.81	16.53	14.06	11.93	9.52	7.58	6.54	4.30	3.63
1.85V	177.32	112.35	76.06	58.26	47.16	28.44	20.23	16.32	13.66	11.70	9.16	7.51	6.43	4.25	3.61

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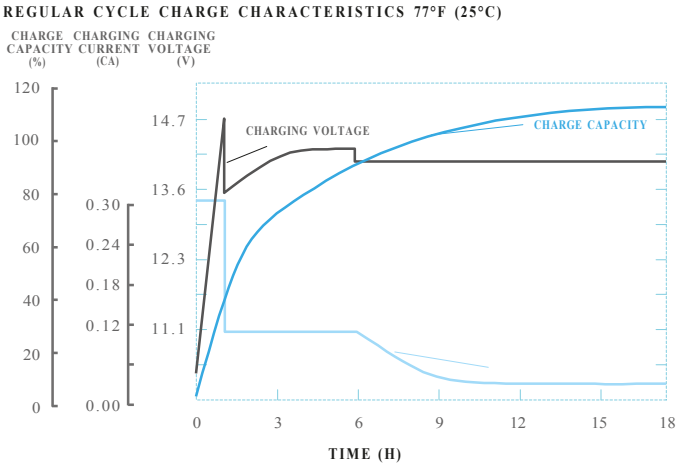
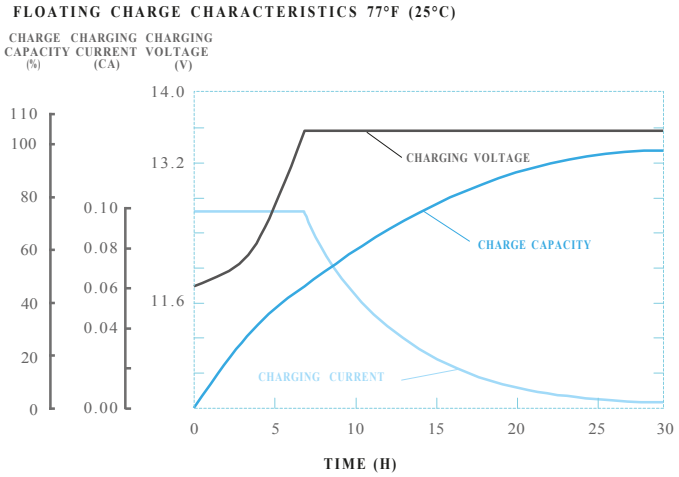
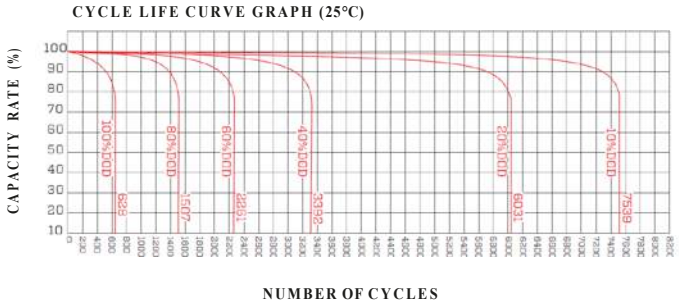
CYCLE CHARGE CHARACTERISTIC (25°C)

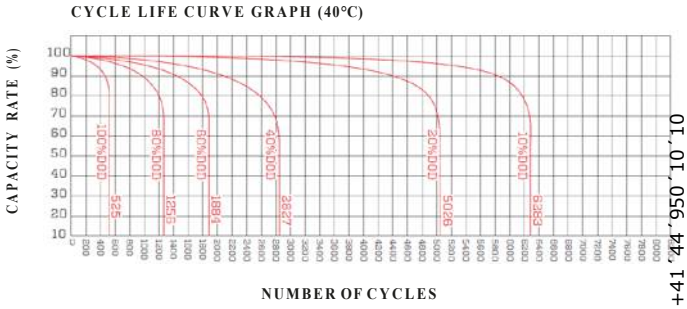


FLOATING CHARGE CHARACTERISTIC (25°C)

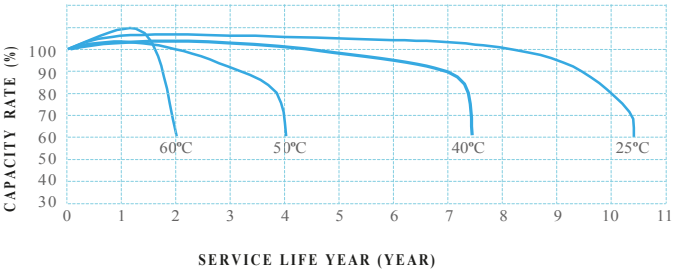


CYCLE LIFE CURVE GRAPH

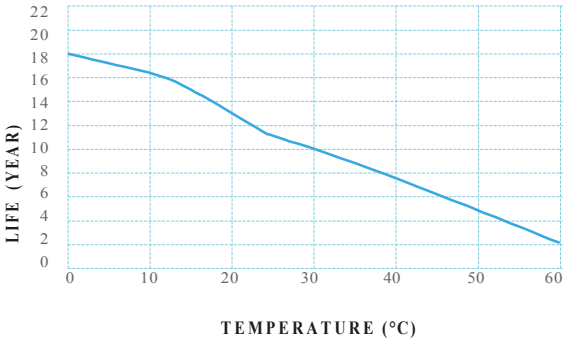




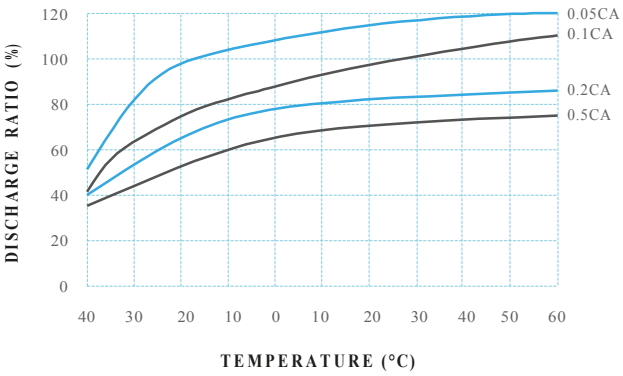
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

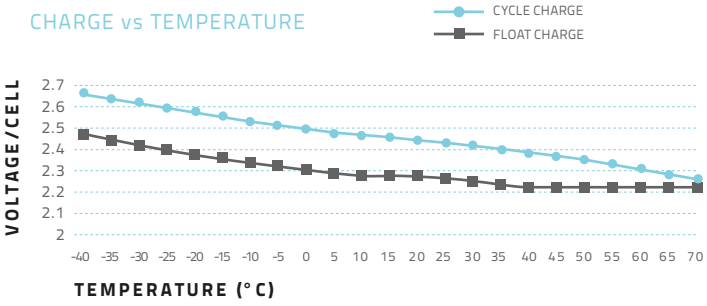
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		55AH	
Dimension	Total Height (top of terminal)	215 mm	8.46"
	Height	215 mm	8.46"
	Length	229 mm	9.02"
	Width	138 mm	5.43"
Weight		Approximately 16.9kg / 37.25 lbs	
Capacity 25°C	120 hour rate (0.55A)	66 AH	
	20 hour rate (3.0A)	60 AH	
	10 hour rate (5.5A)	55 AH	
Internal Resistance	Fully charged Battery (25°C)	8mΩ	
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	550A(5S)		
Terminal	Standard	F3	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 16.5A 14.7V/ (25℃)	
	Float	13.6V/ (25°C)	

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 (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	201.83	106.81	64.54	47.05	37.90	21.71	15.77	12.37	10.55	8.97	6.84	5.69	4.78	3.11	2.54
1.67V	187.57	103.31	63.58	46.73	37.83	21.62	15.48	12.30	10.40	8.90	6.83	5.63	4.77	3.10	2.53
1.70V	185.66	101.73	62.94	46.10	37.52	21.43	15.39	12.24	10.24	8.81	6.80	5.63	4.75	3.09	2.53
1.75V	170.08	98.54	62.32	45.78	36.88	21.01	15.32	12.08	10.14	8.74	6.77	5.56	4.73	3.08	2.52
1.80V	152.59	92.18	59.76	44.51	35.92	20.70	15.26	12.05	10.01	8.65	6.74	5.50	4.71	2.97	2.52
1.83V	145.86	84.57	58.82	42.92	34.34	20.51	14.66	11.54	9.79	8.33	6.60	5.28	4.51	2.94	2.49
1.85V	136.69	82.02	55.00	41.33	33.38	19.68	14.27	11.38	9.54	8.05	6.52	5.21	4.45	2.91	2.46

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	337.26	187.55	120.79	88.05	70.83	41.01	29.98	23.75	20.06	17.23	13.29	11.00	9.25	6.17	5.05
1.67V	321.05	184.69	115.91	87.42	70.89	41.01	29.59	23.71	20.06	17.20	13.29	10.97	9.25	6.17	5.05
1.70V	319.14	183.41	115.85	87.42	70.25	40.69	29.53	23.63	19.74	17.07	13.19	10.87	9.15	6.13	5.05
1.75V	297.21	181.19	115.98	87.42	69.93	40.37	29.47	23.59	19.68	16.94	13.13	10.80	9.15	6.13	5.02
1.80V	272.74	171.97	113.48	85.83	69.62	40.37	29.44	23.52	19.55	16.94	13.10	10.74	9.15	5.98	5.02
1.83V	263.20	157.98	112.53	83.28	66.75	40.05	28.61	22.73	19.33	16.40	13.10	10.43	9.00	5.91	4.99
1.85V	243.81	154.49	104.58	80.11	64.85	39.10	27.81	22.44	18.79	16.08	12.59	10.33	8.84	5.85	4.96

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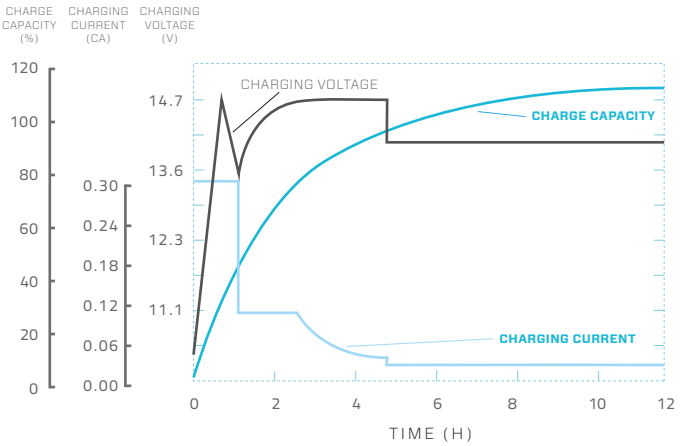
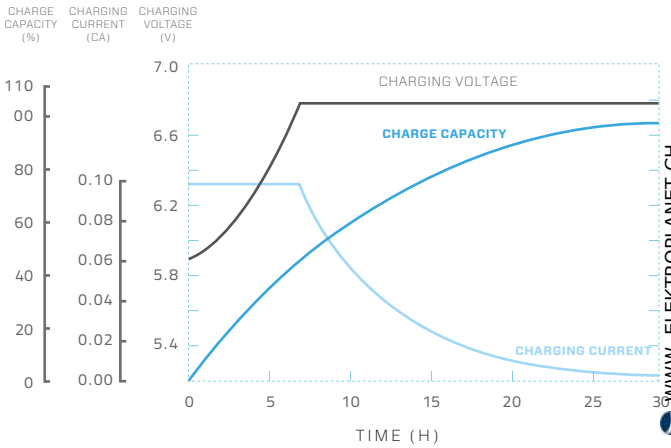
CYCLE CHARGE CHARACTERISTIC (25°C)

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



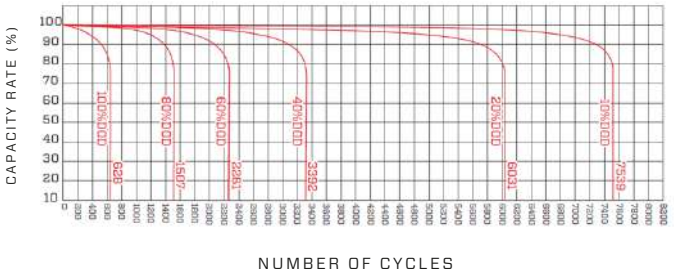
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

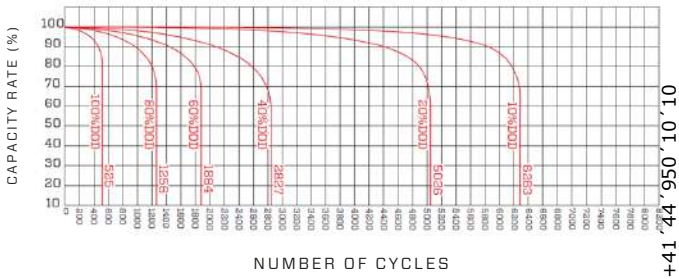


CYCLE LIFE CURVE GRAPH

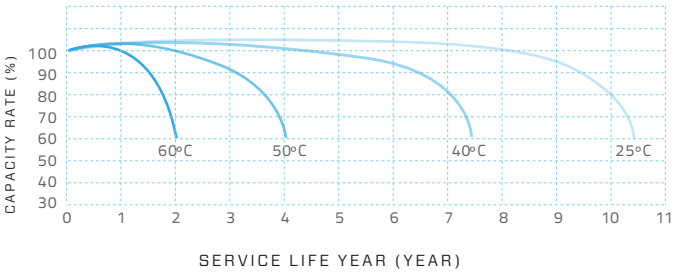
CYCLE LIFE CURVE GRAPH (25°C)



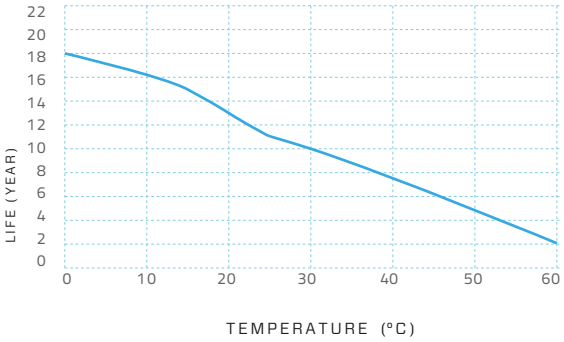
CYCLE LIFE CURVE GRAPH (40°C)



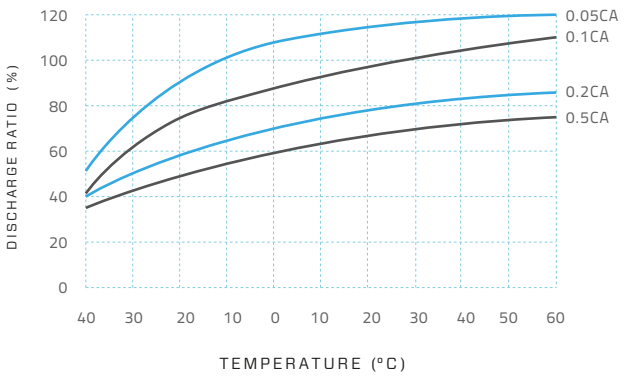
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

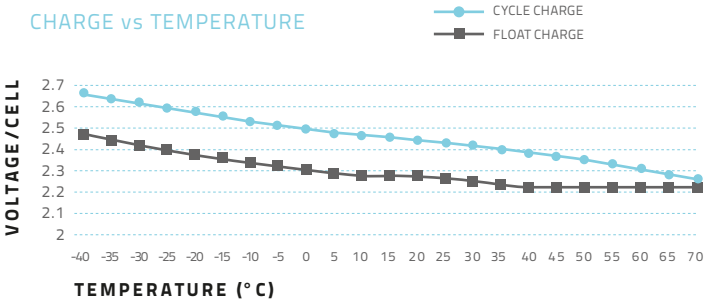
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		65AH	
Dimension	Total Height (top of terminal)	175 mm	6.89"
	Height	175 mm	6.89"
	Length	348 mm	13.7"
	Width	167 mm	6.57"
Weight		Approximately 21kg / 46.29 lbs	
Capacity 25°C	120 hour rate (0.65A)	78 AH	
	20 hour rate (3.6A)	72 AH	
	10 hour rate (6.5A)	65 AH	
Internal Resistance	Fully charged Battery (25°C)	7.5mΩ	
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	650A(5S)		
Terminal	Standard	F4	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 19.5A 14.7V/ (25℃)	
	Float	13.6V/ (25°C)	

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 (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	238.52	126.23	76.27	55.61	44.79	25.66	18.64	14.62	12.47	10.60	8.08	6.73	5.64	3.67	3.00
1.67V	221.68	122.10	75.14	55.22	44.71	25.55	18.30	14.54	12.29	10.52	8.07	6.65	5.64	3.66	2.99
1.70V	219.41	120.22	74.39	54.48	44.34	25.32	18.18	14.46	12.10	10.41	8.04	6.65	5.62	3.65	2.99
1.75V	201.01	116.45	73.65	54.11	43.58	24.84	18.11	14.28	11.99	10.33	8.00	6.58	5.59	3.64	2.98
1.80V	180.34	108.94	70.63	52.60	42.46	24.46	18.04	14.24	11.84	10.22	7.97	6.50	5.56	3.51	2.98
1.83V	172.38	99.94	69.51	50.73	40.58	24.23	17.32	13.64	11.57	9.84	7.80	6.24	5.33	3.48	2.94
1.85V	161.54	96.93	65.00	48.85	39.45	23.26	16.87	13.45	11.27	9.52	7.70	6.16	5.26	3.44	2.91

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	398.58	221.65	142.76	104.06	83.71	48.46	35.43	28.06	23.70	20.36	15.70	13.00	10.93	7.29	5.97
1.67V	379.42	218.26	136.98	103.31	83.77	48.46	34.98	28.03	23.70	20.32	15.70	12.96	10.93	7.29	5.97
1.70V	377.17	216.76	136.92	103.31	83.02	48.09	34.90	27.92	23.33	20.17	15.59	12.85	10.82	7.25	5.97
1.75V	351.25	214.13	137.07	103.31	82.65	47.71	34.83	27.87	23.25	20.02	15.52	12.76	10.82	7.25	5.94
1.80V	322.33	203.24	134.11	101.43	82.27	47.71	34.79	27.80	23.10	20.02	15.48	12.70	10.82	7.06	5.94
1.83V	311.05	186.71	132.99	98.43	78.89	47.33	33.81	26.86	22.84	19.38	15.48	12.32	10.63	6.99	5.90
1.85V	288.14	182.57	123.59	94.67	76.64	46.21	32.87	26.52	22.20	19.01	14.88	12.21	10.44	6.91	5.86

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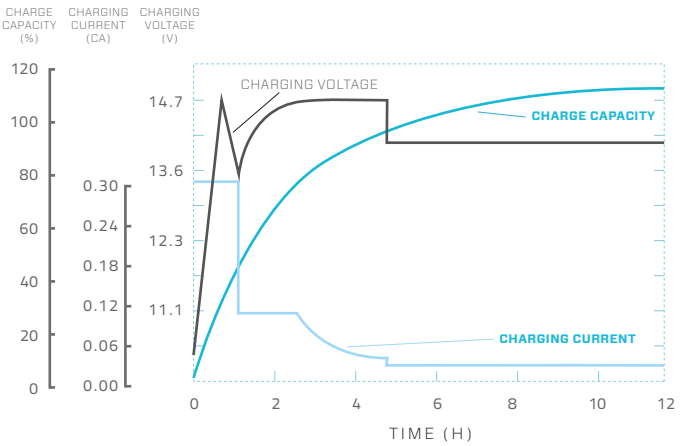
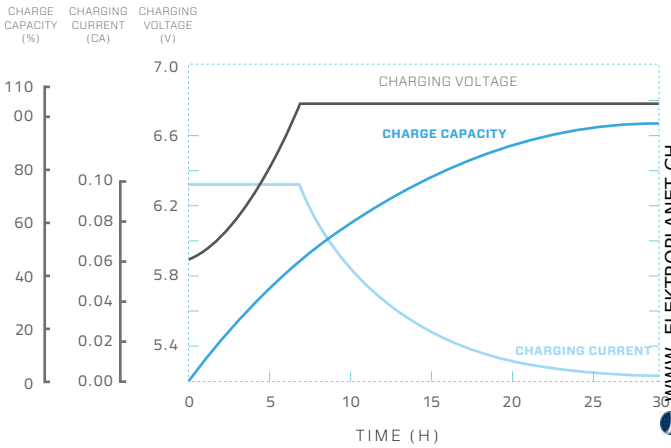
CYCLE CHARGE CHARACTERISTIC (25°C)

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



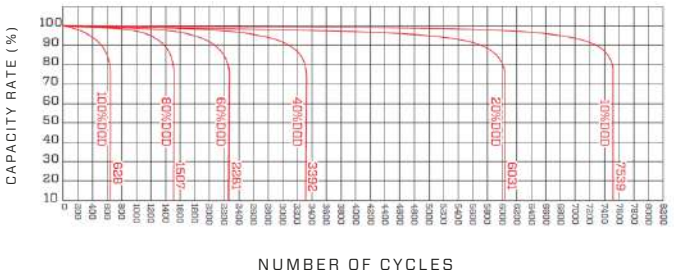
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

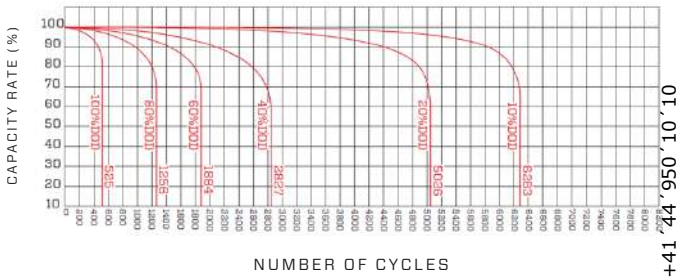


CYCLE LIFE CURVE GRAPH

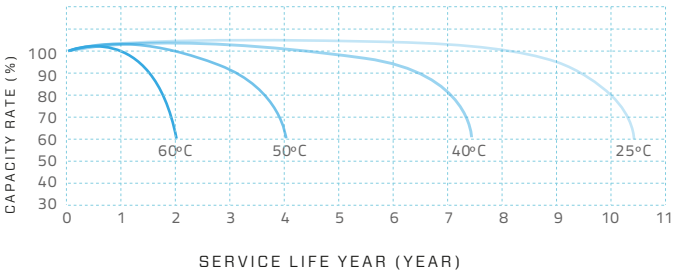
CYCLE LIFE CURVE GRAPH (25°C)



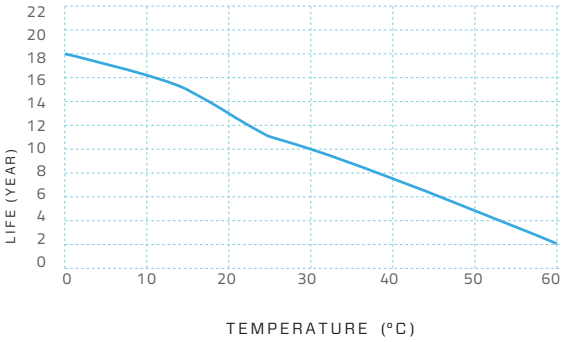
CYCLE LIFE CURVE GRAPH (40°C)



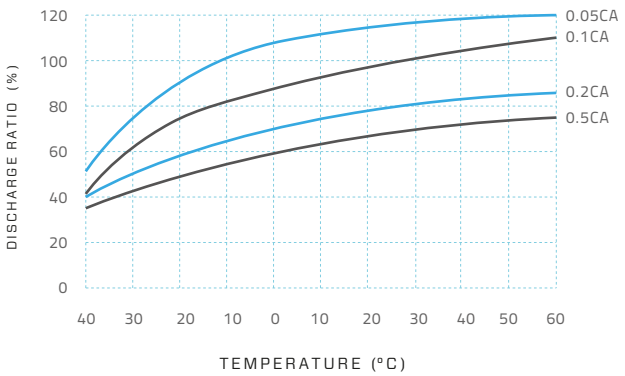
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

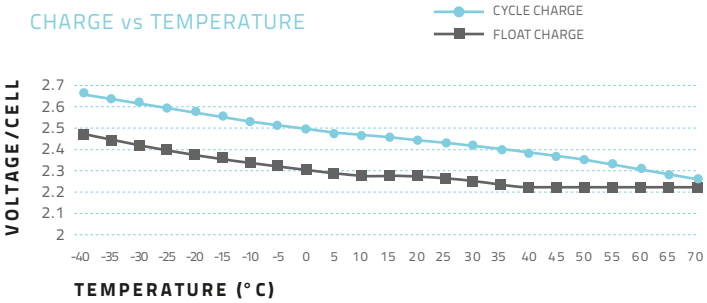
SPECIFICATION

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 25°C	120 hour rate (0.7A)	84 AH	
	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℃)	
	Float	13.6V/ (25℃)	

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 (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	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

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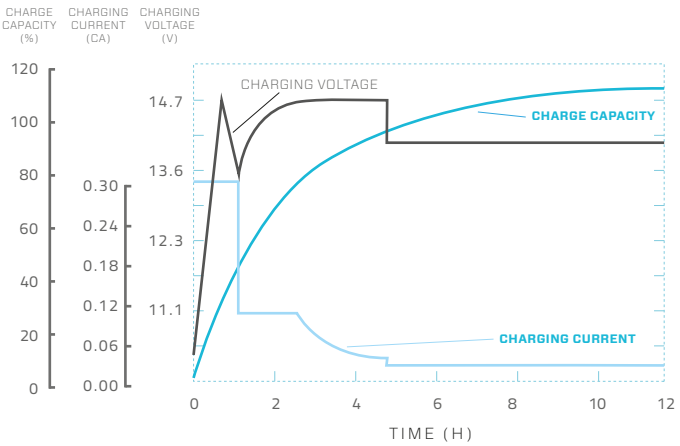
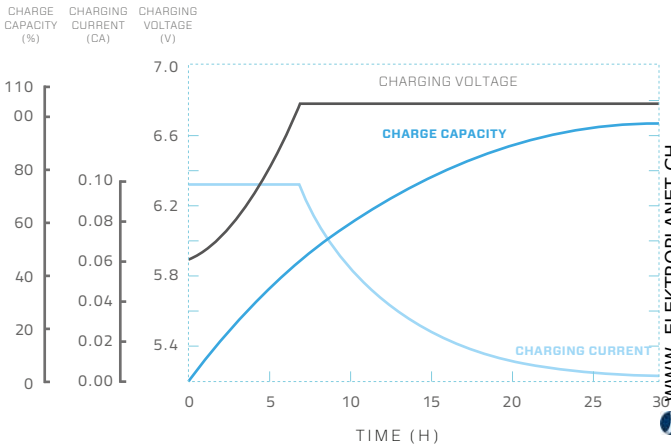
CYCLE CHARGE CHARACTERISTIC (25°C)

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



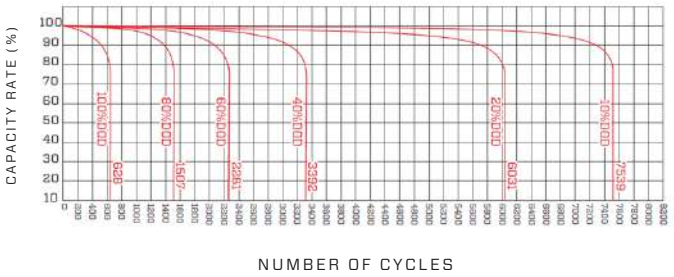
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

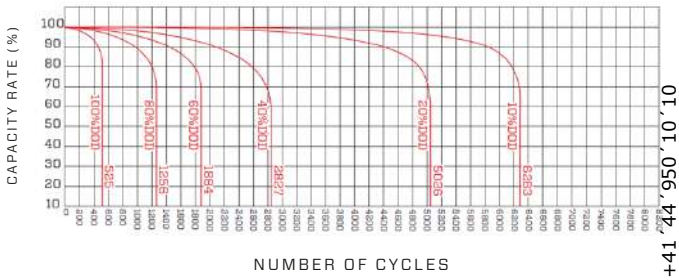


CYCLE LIFE CURVE GRAPH

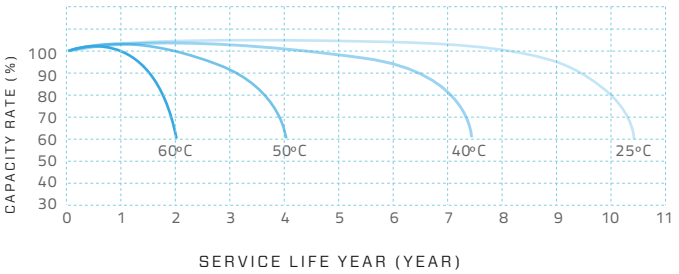
CYCLE LIFE CURVE GRAPH (25°C)



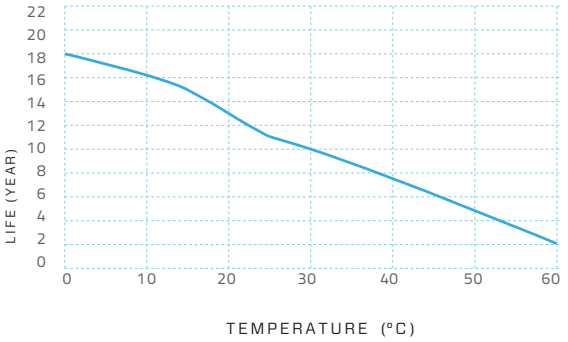
CYCLE LIFE CURVE GRAPH (40°C)



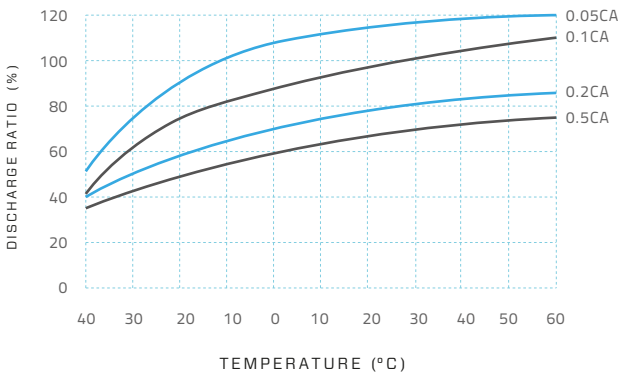
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

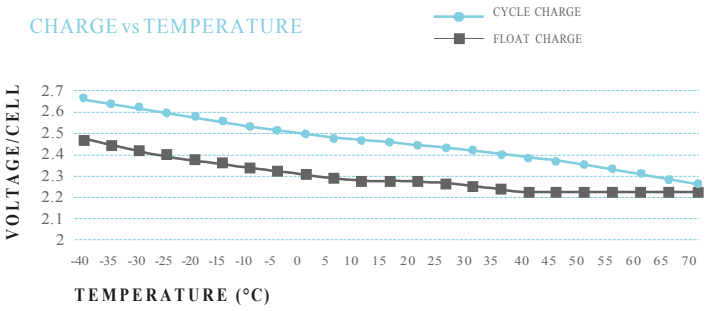
SPECIFICATION

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/61.67lbs	
Capacity 25ºC	120 hour rate (0.9A)	108 AH	
	20 hour rate (5.0A)	100 AH	
	10 hour rate (9A)	90 AH	
Internal Resistance	Fully charged Battery (25ºC)	6.3m	
Self-Discharge 25ºC	Capacity after 3 month storage	95%	
	Capacity after 6 month storage	85%	
	Capacity after 12 month storage	80%	
Max Discharge Current 25ºC	900A(5S)		
Terminal	Standard	F3	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 27A 14.7V/(25□)	
	Float	13.6V/(25□)	

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 (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

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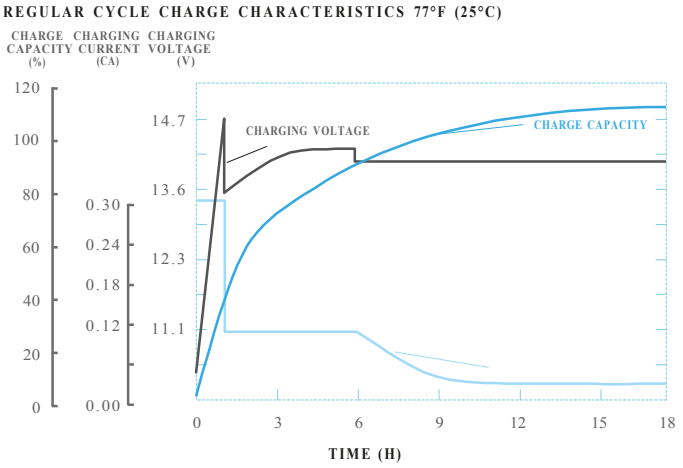
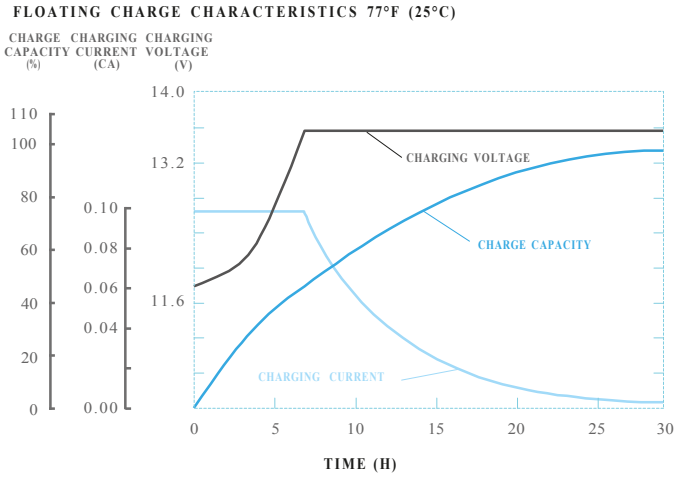
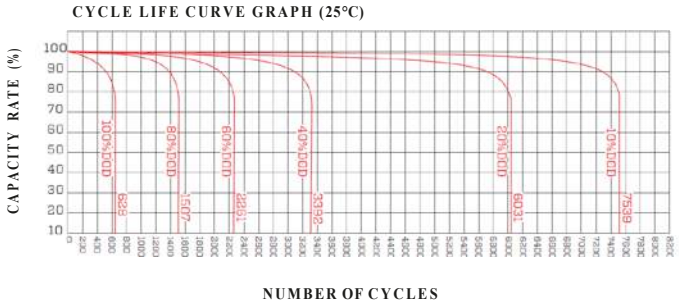
CYCLE CHARGE CHARACTERISTIC (25°C)

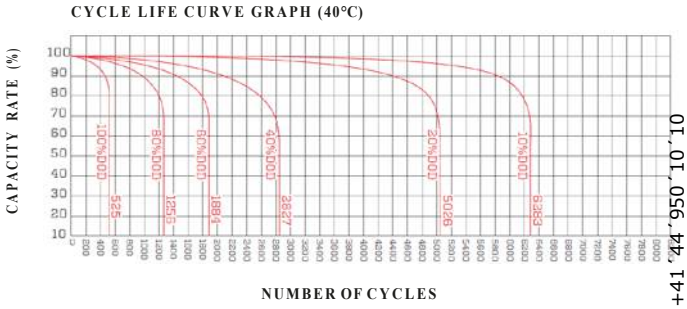


FLOATING CHARGE CHARACTERISTIC (25°C)

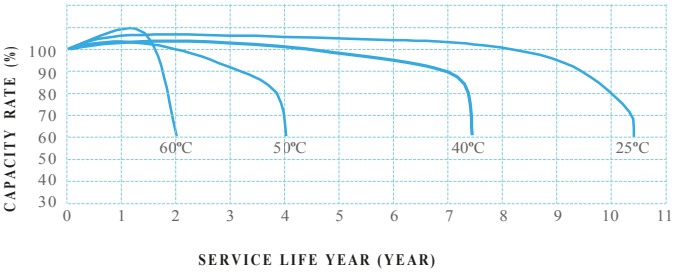


CYCLE LIFE CURVE GRAPH

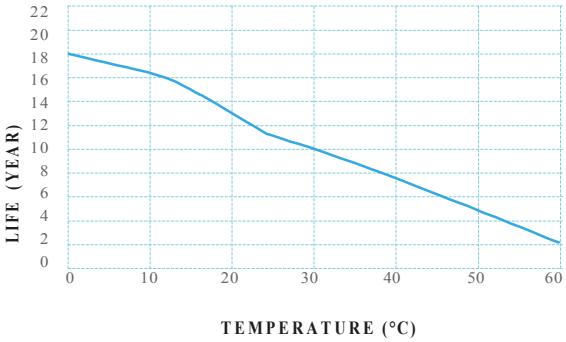




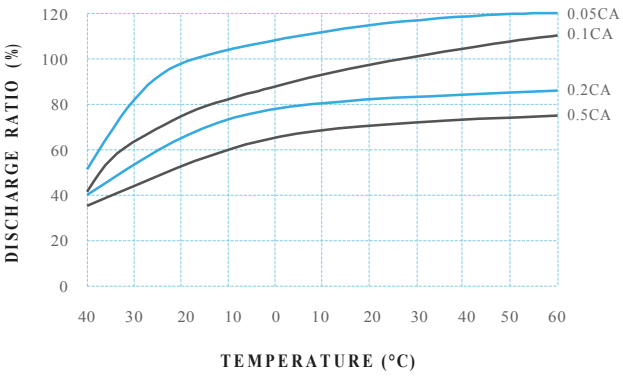
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

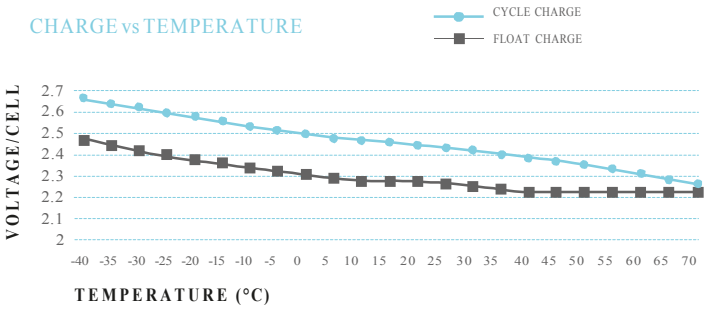
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		100 AH	
Dimension	Total Height (top of terminal)	210 mm	8.26"
	Height	206 mm	8.11"
	Length	330 mm	12.99"
	Width	172 mm	6.77"
Weight		Approximately 30kg/66.08lbs	
Capacity 25ºC	120 hour rate (1.2A)	120 AH	
	20 hour rate (5.5A)	110 AH	
	10 hour rate (10A)	100 AH	
Internal Resistance	Fully charged Battery (25ºC)	6m	
Self-Discharge 25ºC	Capacity after 3 month storage	95%	
	Capacity after 6 month storage	85%	
	Capacity after 12 month storage	80%	
Max Discharge Current 25ºC	1000A (5S)		
Terminal	Standard	F3	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 30A 14.7V/(25□)	
	Float	13.6V/(25□)	

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 (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	366.96	194.20	117.34	85.55	68.90	39.48	28.67	22.49	19.18	16.30	12.43	10.35	8.68	5.65	4.62
1.67V	341.04	187.84	115.60	84.96	68.78	39.31	28.15	22.37	18.90	16.19	12.41	10.23	8.67	5.64	4.60
1.70V	337.56	184.96	114.44	83.81	68.21	38.96	27.98	22.25	18.61	16.01	12.37	10.23	8.64	5.62	4.60
1.75V	309.24	179.16	113.30	83.24	67.05	38.21	27.86	21.97	18.44	15.90	12.31	10.12	8.60	5.60	4.59
1.80V	277.44	167.60	108.66	80.92	65.32	37.63	27.75	21.91	18.21	15.72	12.25	10.00	8.56	5.40	4.58
1.83V	265.20	153.76	106.94	78.04	62.43	37.28	26.65	20.98	17.80	15.14	11.99	9.60	8.21	5.35	4.52
1.85V	248.52	149.12	100.00	75.15	60.69	35.78	25.95	20.69	17.34	14.64	11.85	9.48	8.09	5.29	4.48

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	613.20	341.00	219.62	160.09	128.79	74.56	54.50	43.17	36.47	31.33	24.16	20.00	16.82	11.21	9.19
1.67V	583.73	335.79	210.74	158.94	128.88	74.56	53.81	43.12	36.47	31.27	24.16	19.94	16.82	11.21	9.19
1.70V	580.26	333.48	210.64	158.94	127.72	73.98	53.69	42.96	35.89	31.04	23.99	19.77	16.65	11.15	9.19
1.75V	540.38	329.43	210.88	158.94	127.15	73.40	53.58	42.88	35.78	30.81	23.87	19.63	16.65	11.15	9.13
1.80V	495.89	312.67	206.33	156.05	126.57	73.40	53.52	42.77	35.54	30.81	23.81	19.54	16.65	10.87	9.13
1.83V	478.54	287.24	204.60	151.42	121.37	72.82	52.02	41.32	35.14	29.82	23.81	18.96	16.36	10.75	9.07
1.85V	443.29	280.88	190.15	145.65	117.90	71.09	50.57	40.80	34.16	29.24	22.89	18.78	16.07	10.63	9.02

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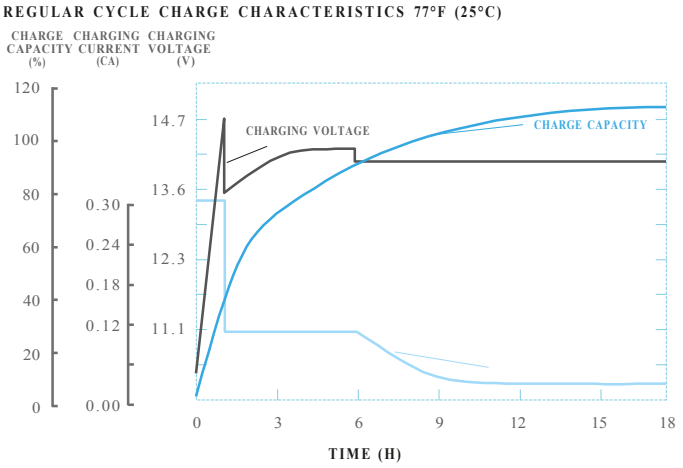
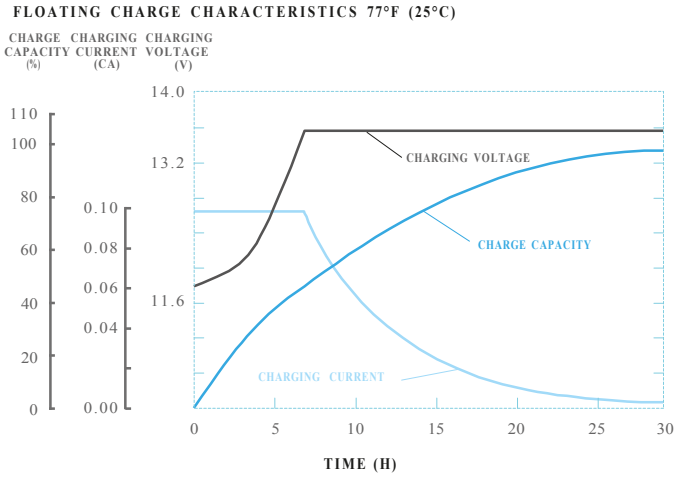
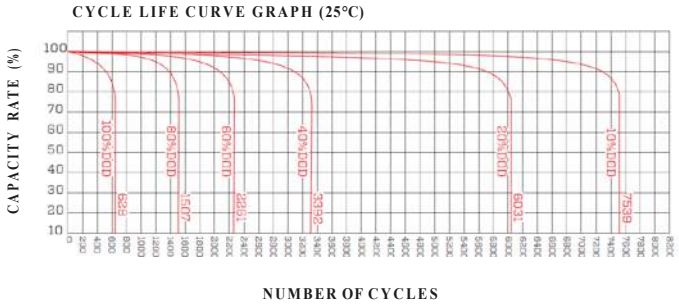
CYCLE CHARGE CHARACTERISTIC (25°C)

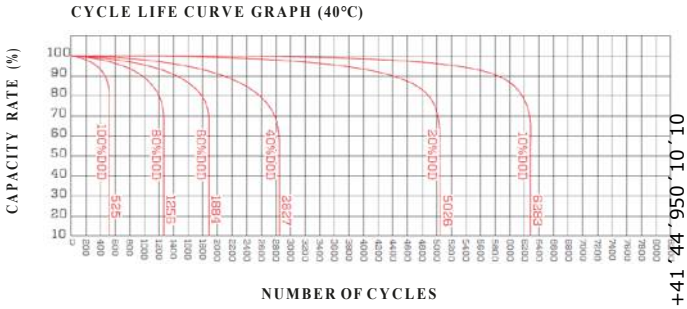


FLOATING CHARGE CHARACTERISTIC (25°C)

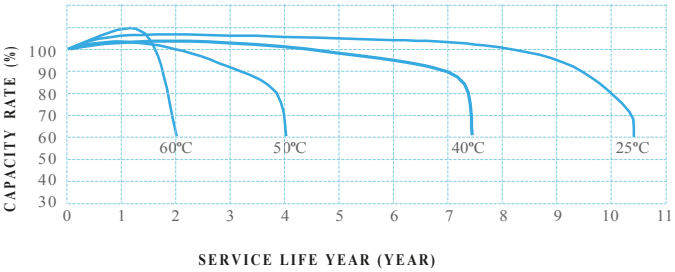


CYCLE LIFE CURVE GRAPH

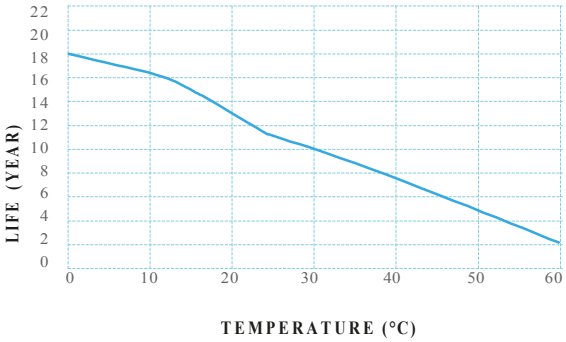




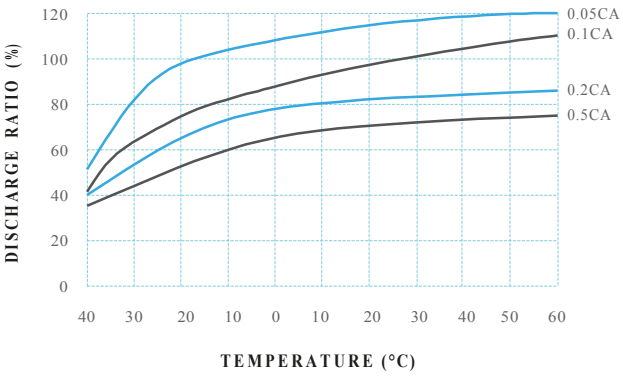
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

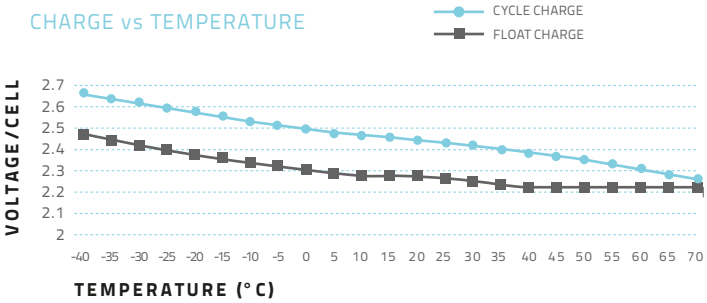
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		120 AH	
Dimension	Total Height (top of terminal) Height Length Width	234 mm 211 mm 408 mm 172 mm	9.21" 8.31" 16.06" 6.77"
Weight		Approximately 36.5 kg / 80.46 lbs	
Capacity 25°C	120 hour rate (1.2A) 20 hour rate (6.6A) 10 hour rate (12A)	144 AH 132 AH 120 AH	
Internal Resistance	Fully charged Battery (25°C)	6mΩ	
Self-Discharge 25°C	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	95% 85% 80%	
Max Discharge Current 25°C	1200A (5S)		
Terminal	Standard	F4	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 36A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	440.35	233.04	140.81	102.66	82.68	47.37	34.40	26.98	23.01	19.56	14.91	12.42	10.42	6.78	5.54
1.67V	409.25	225.41	138.72	101.95	82.54	47.17	33.78	26.84	22.68	19.42	14.89	12.28	10.40	6.76	5.52
1.70V	405.07	221.95	137.33	100.58	81.85	46.75	33.57	26.70	22.33	19.21	14.84	12.28	10.37	6.74	5.51
1.75V	371.09	214.99	135.96	99.89	80.46	45.85	33.43	26.37	22.13	19.08	14.77	12.14	10.32	6.71	5.51
1.80V	332.93	201.12	130.39	97.10	78.38	45.16	33.30	26.29	21.85	18.87	14.71	12.00	10.27	6.49	5.49
1.83V	318.24	184.51	128.33	93.65	74.92	44.74	31.98	25.18	21.36	18.17	14.39	11.51	9.85	6.42	5.42
1.85V	298.22	178.94	120.00	90.18	72.83	42.94	31.14	24.83	20.81	17.57	14.22	11.38	9.71	6.35	5.38

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	735.84	409.19	263.55	192.11	154.54	89.47	65.40	51.81	43.76	37.59	28.99	24.00	20.18	13.46	11.03
1.67V	700.48	402.95	252.89	190.73	154.66	89.47	64.57	51.74	43.76	37.52	28.99	23.93	20.18	13.45	11.03
1.70V	696.31	400.17	252.77	190.73	153.27	88.77	64.43	51.55	43.07	37.24	28.78	23.72	19.97	13.39	11.03
1.75V	648.46	395.32	253.05	190.72	152.58	88.08	64.29	51.46	42.93	36.97	28.64	23.56	19.97	13.39	10.96
1.80V	595.07	375.20	247.59	187.25	151.89	88.08	64.22	51.32	42.65	36.97	28.57	23.44	19.97	13.04	10.96
1.83V	574.25	344.69	245.52	181.71	145.65	87.39	62.42	49.59	42.17	35.79	28.57	22.75	19.63	12.90	10.89
1.85V	531.95	337.06	228.18	174.78	141.48	85.31	60.69	48.96	40.99	35.09	27.47	22.54	19.28	12.76	10.82

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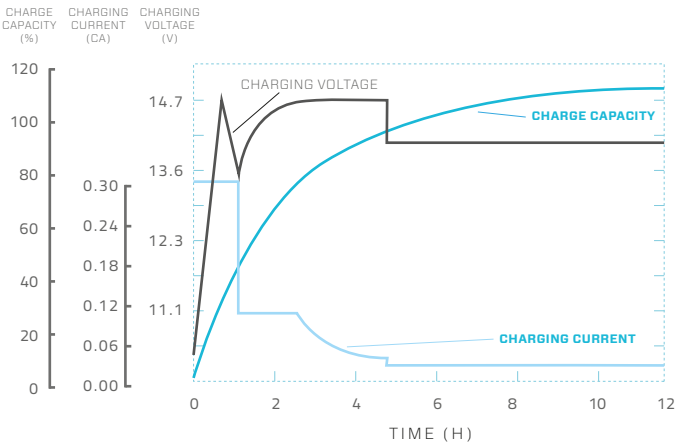
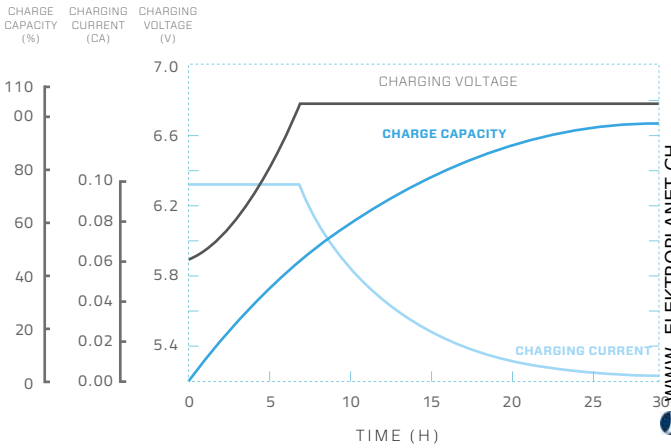
CYCLE CHARGE CHARACTERISTIC (25°C)

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



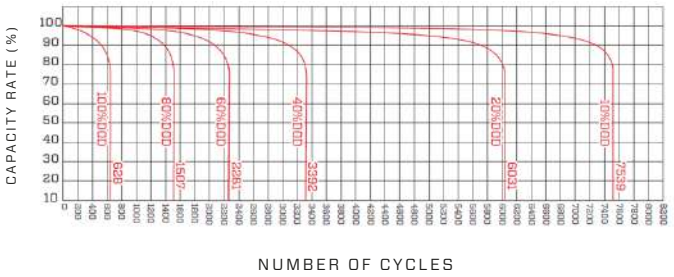
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

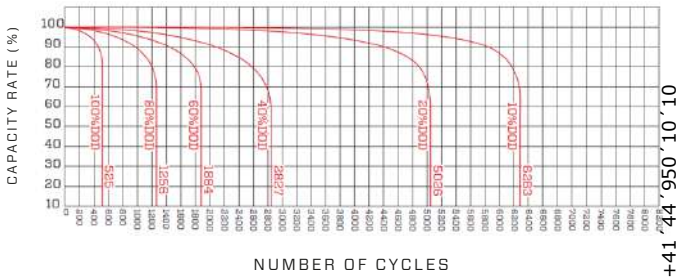


CYCLE LIFE CURVE GRAPH

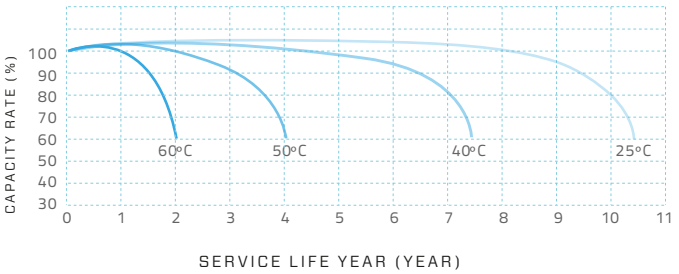
CYCLE LIFE CURVE GRAPH (25°C)



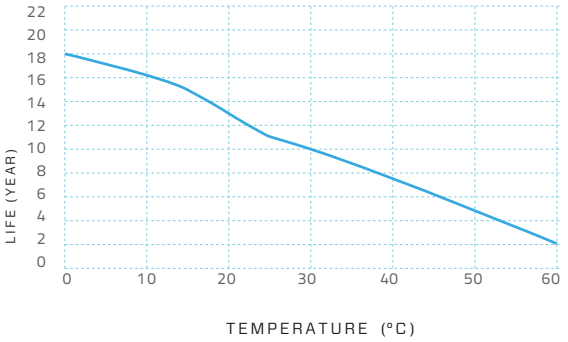
CYCLE LIFE CURVE GRAPH (40°C)



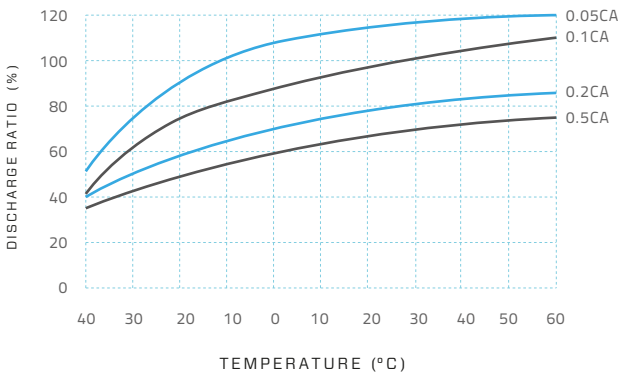
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

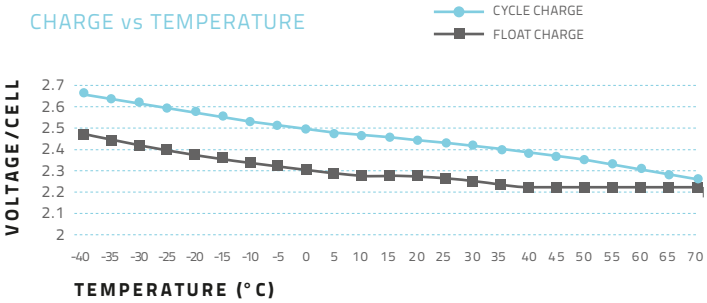
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		150 AH	
Dimension	Total Height (top of terminal)	241 mm	9.49"
	Height	241 mm	9.49"
	Length	486 mm	19.13"
	Width	170 mm	6.69"
Weight		Approximately 45kg / 99.20 lbs	
Capacity 25°C	120 hour rate (1.5A)	180 AH	
	20 hour rate (8.1A)	162 AH	
	10 hour rate (15A)	150 AH	
Internal Resistance	Fully charged Battery (25°C)	4mΩ	
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	1500A (5S)		
Terminal	Standard	F4	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 45A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	550.44	291.30	176.01	128.32	103.35	59.21	43.01	33.73	28.77	24.45	18.64	15.52	13.03	8.48	6.93
1.67V	511.56	281.76	173.40	127.44	103.17	58.96	42.23	33.56	28.35	24.28	18.62	15.35	13.01	8.45	6.90
1.70V	506.34	277.44	171.66	125.72	102.32	58.44	41.97	33.38	27.92	24.02	18.55	15.35	12.96	8.43	6.89
1.75V	463.86	268.74	169.95	124.86	100.58	57.31	41.79	32.96	27.66	23.84	18.47	15.17	12.90	8.39	6.88
1.80V	416.16	251.40	162.99	121.38	97.98	56.45	41.62	32.86	27.31	23.58	18.38	15.00	12.83	8.11	6.87
1.83V	397.80	230.64	160.41	117.06	93.65	55.92	39.97	31.47	26.71	22.72	17.99	14.39	12.31	8.02	6.78
1.85V	372.78	223.68	150.00	112.72	91.04	53.67	38.93	31.04	26.01	21.97	17.78	14.22	12.14	7.93	6.72

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	919.79	511.49	329.44	240.14	193.18	111.83	81.75	64.76	54.70	46.99	36.24	30.00	25.23	16.82	13.78
1.67V	875.59	503.69	316.12	238.41	193.33	111.83	80.71	64.67	54.70	46.90	36.24	29.91	25.23	16.82	13.78
1.70V	870.39	500.22	315.96	238.41	191.58	110.97	80.54	64.43	53.84	46.55	35.98	29.65	24.97	16.73	13.78
1.75V	810.58	494.15	316.31	238.41	190.73	110.10	80.37	64.33	53.66	46.21	35.80	29.45	24.97	16.73	13.70
1.80V	743.84	469.00	309.49	234.07	189.86	110.10	80.28	64.15	53.32	46.21	35.72	29.30	24.97	16.30	13.70
1.83V	717.82	430.86	306.90	227.14	182.06	109.23	78.02	61.99	52.71	44.73	35.72	28.44	24.53	16.13	13.61
1.85V	664.93	421.32	285.22	218.48	176.86	106.63	75.86	61.21	51.24	43.87	34.33	28.18	24.10	15.95	13.52

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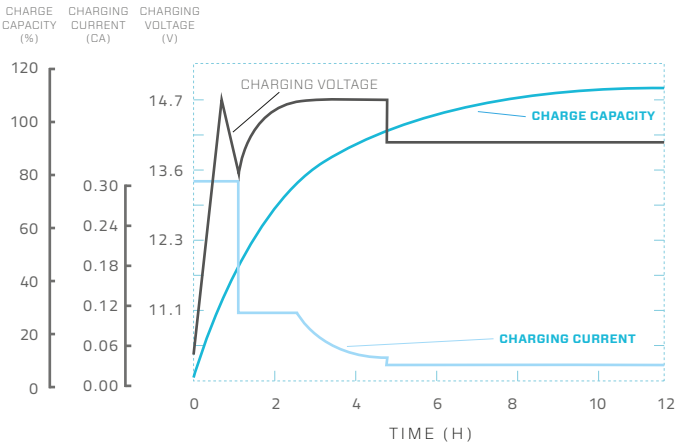
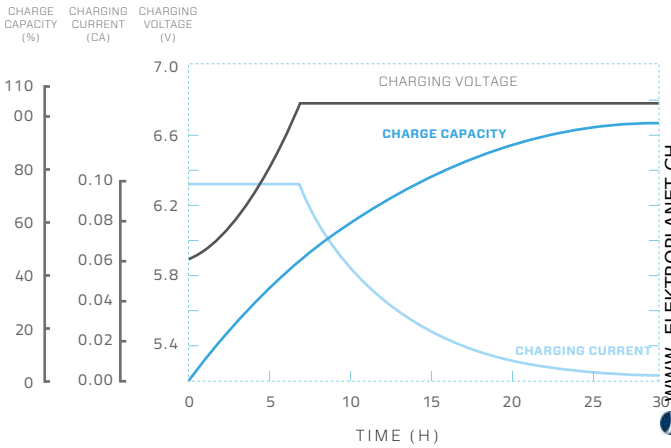
CYCLE CHARGE CHARACTERISTIC (25°C)

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



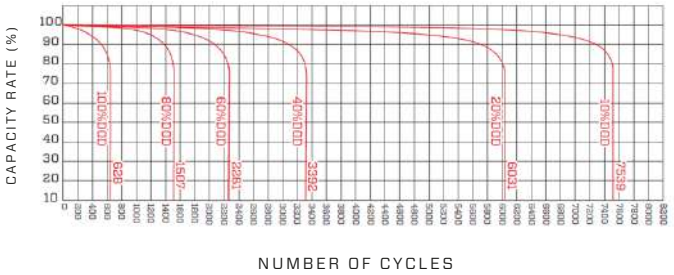
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

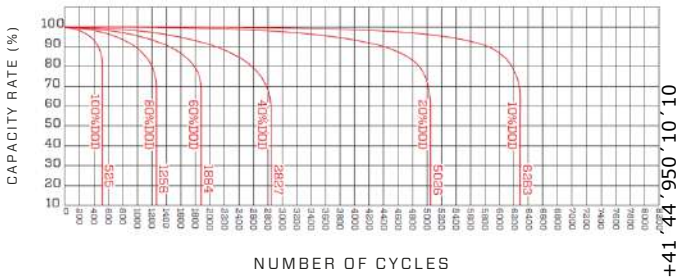


CYCLE LIFE CURVE GRAPH

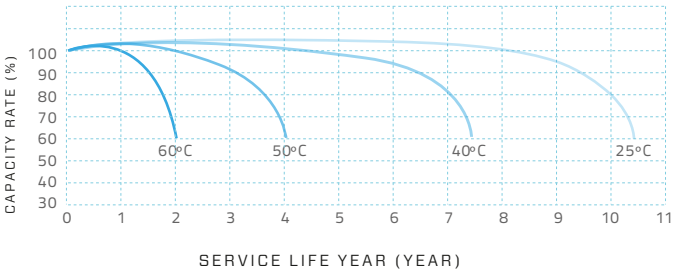
CYCLE LIFE CURVE GRAPH (25°C)



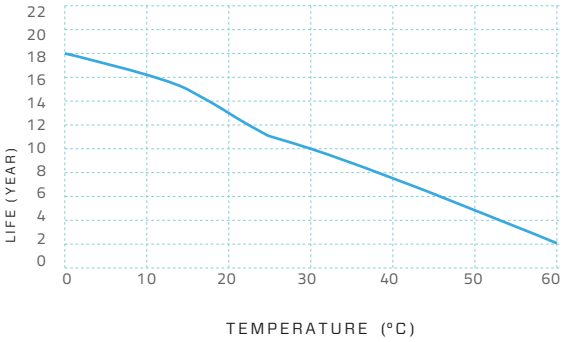
CYCLE LIFE CURVE GRAPH (40°C)



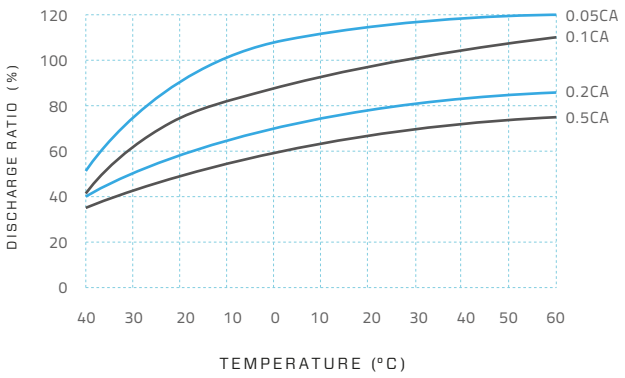
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

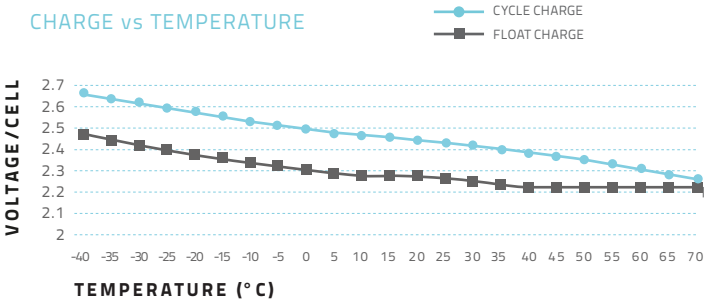
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		180 AH	
Dimension	Total Height (top of terminal)	224 mm	8.82"
	Height	219 mm	8.62"
	Length	522 mm	20.55"
	Width	240 mm	9.45"
Weight		Approximately 60kg / 132.27 lbs	
Capacity 25°C	120 hour rate (1.8A)	216 AH	
	20 hour rate (9.5A)	190 AH	
	10 hour rate (18)	180 AH	
Internal Resistance	Fully charged Battery (25°C)	3mΩ	
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)		
Terminal	Standard	F4	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 54A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	660.53	349.56	211.21	153.98	124.02	71.06	51.61	40.47	34.52	29.34	22.37	18.62	15.63	10.18	8.31
1.67V	613.87	338.11	208.08	152.93	123.80	70.75	50.67	40.27	34.02	29.13	22.34	18.42	15.61	10.14	8.28
1.70V	607.61	332.93	205.99	150.86	122.78	70.13	50.36	40.05	33.50	28.82	22.27	18.42	15.56	10.11	8.27
1.75V	556.63	322.49	203.94	149.83	120.69	68.77	50.15	39.55	33.19	28.61	22.16	18.21	15.48	10.07	8.26
1.80V	499.39	301.68	195.59	145.66	117.57	67.73	49.94	39.43	32.77	28.30	22.06	18.00	15.40	9.73	8.24
1.83V	477.36	276.77	192.49	140.47	112.37	67.11	47.96	37.77	32.05	27.26	21.59	17.27	14.77	9.62	8.13
1.85V	447.34	268.42	180.00	135.26	109.24	64.40	46.72	37.25	31.22	26.36	21.33	17.06	14.57	9.52	8.06

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	1103.75	613.79	395.32	288.17	231.82	134.20	98.10	77.71	65.64	56.39	43.49	36.00	30.27	20.18	16.54
1.67V	1050.71	604.42	379.34	286.09	231.99	134.20	96.85	77.61	65.64	56.28	43.49	35.89	30.27	20.18	16.54
1.70V	1044.47	600.26	379.16	286.09	229.90	133.16	96.65	77.32	64.60	55.87	43.17	35.58	29.96	20.08	16.54
1.75V	972.69	592.97	379.58	286.09	228.87	132.12	96.44	77.19	64.40	55.45	42.96	35.34	29.96	20.08	16.44
1.80V	892.61	562.80	371.39	280.88	227.83	132.12	96.33	76.98	63.98	55.45	42.86	35.16	29.96	19.56	16.44
1.83V	861.38	517.04	368.28	272.56	218.47	131.08	93.63	74.38	63.25	53.68	42.86	34.12	29.44	19.35	16.33
1.85V	797.92	505.59	342.26	262.18	212.23	127.96	91.03	73.45	61.48	52.64	41.20	33.81	28.92	19.14	16.23

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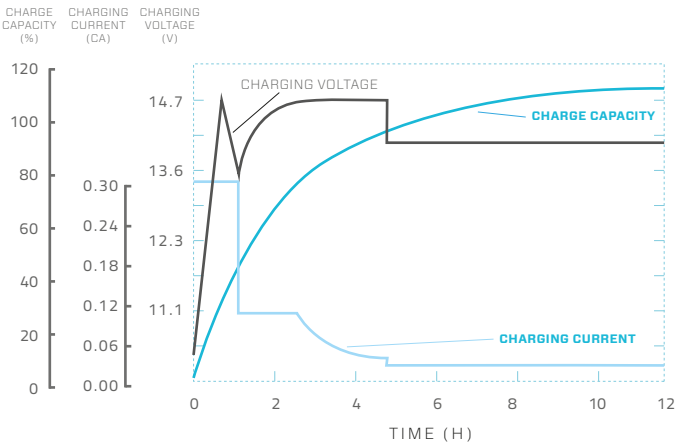
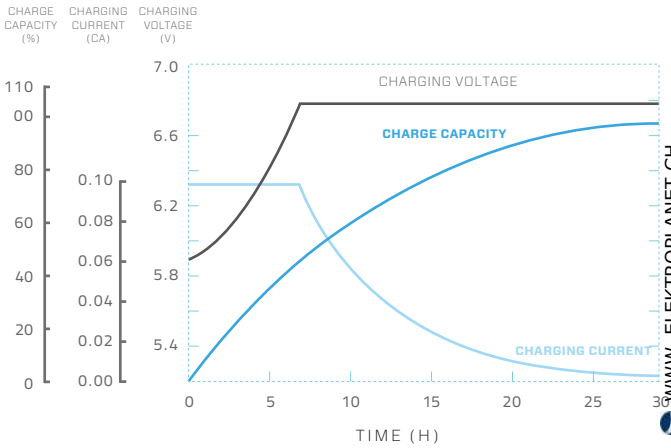
CYCLE CHARGE CHARACTERISTIC (25°C)

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



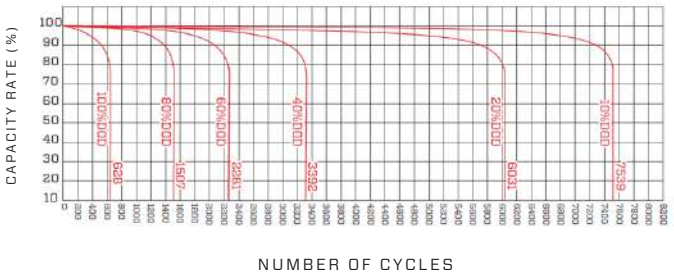
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

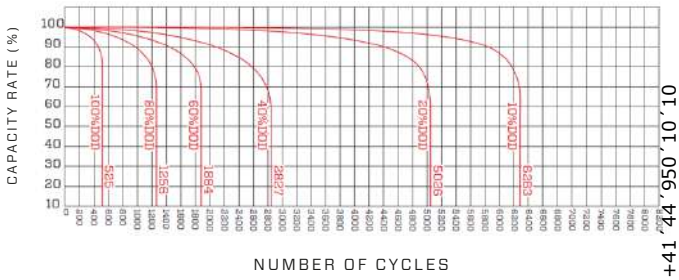


CYCLE LIFE CURVE GRAPH

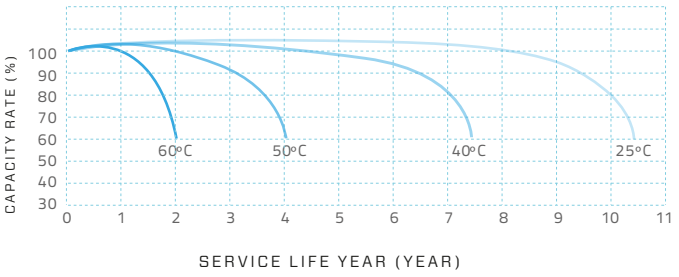
CYCLE LIFE CURVE GRAPH (25°C)



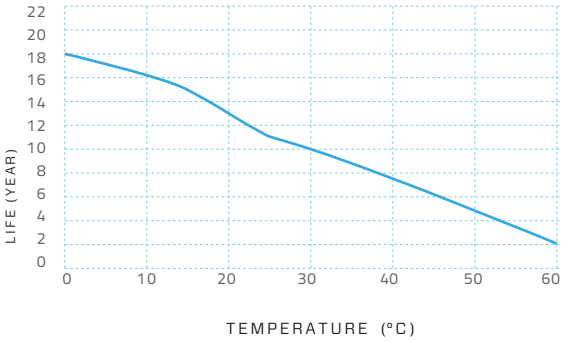
CYCLE LIFE CURVE GRAPH (40°C)



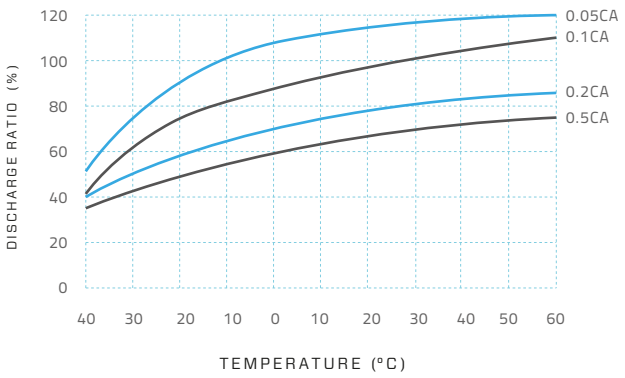
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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LEAD CRYSTAL® BATTERIES

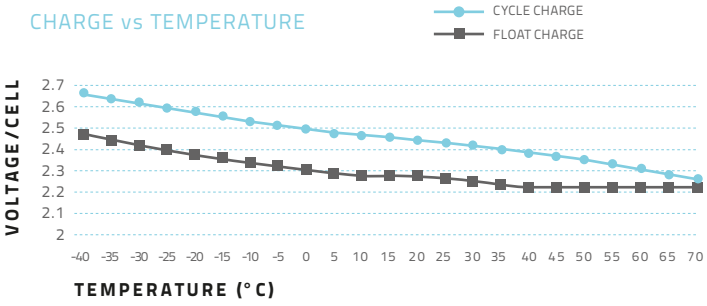
SPECIFICATION

Nominal Voltage		12V	
Rated Capacity (10 hour rate)		200 AH	
Dimension	Total Height (top of terminal)	223 mm	8.78"
	Height	219 mm	8.62"
	Length	522 mm	20.55"
	Width	240 mm	9.45"
Weight		Approximately 64 kg / 141.09 lbs	
Capacity 25°C	120 hour rate (2.0A)	240 AH	
	20 hour rate (11A)	220 AH	
	10 hour rate (20A)	200 AH	
Internal Resistance	Fully charged Battery (25°C)	3.5mΩ	
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	2000A (5S)		
Terminal	Standard	F4	
	Optional		
Charging (Constant Voltage)	Cycle	Initial Charging Current 60A 14.7V/ (25℃)	
	Float	13.6V/ (25℃)	

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 (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	733.92	388.40	234.68	171.09	137.80	78.95	57.34	44.97	38.36	32.60	24.86	20.69	17.37	11.31	9.24
1.67V	682.08	375.68	231.20	169.92	137.56	78.61	56.30	44.74	37.80	32.37	24.82	20.46	17.34	11.27	9.20
1.70V	675.12	369.92	228.88	167.63	136.42	77.92	55.95	44.51	37.22	32.02	24.74	20.46	17.28	11.24	9.19
1.75V	618.48	358.32	226.60	166.48	134.10	76.42	55.72	43.95	36.88	31.79	24.62	20.23	17.20	11.19	9.18
1.80V	554.88	335.20	217.32	161.84	130.64	75.26	55.49	43.82	36.42	31.45	24.51	20.00	17.11	10.81	9.16
1.83V	530.40	307.52	213.88	156.08	124.86	74.57	53.29	41.97	35.61	30.29	23.99	19.19	16.42	10.69	9.04
1.85V	497.04	298.24	200.00	150.29	121.38	71.56	51.91	41.39	34.68	29.29	23.70	18.96	16.18	10.58	8.96

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	1226.39	681.99	439.25	320.19	257.57	149.11	109.00	86.35	72.94	62.65	48.32	40.00	33.64	22.43	18.38
1.67V	1167.46	671.58	421.49	317.88	257.77	149.11	107.62	86.23	72.94	62.54	48.32	39.88	33.64	22.42	18.38
1.70V	1160.52	666.96	421.28	317.88	255.44	147.96	107.38	85.91	71.78	62.07	47.97	39.53	33.29	22.31	18.38
1.75V	1080.77	658.86	421.75	317.87	254.30	146.80	107.16	85.77	71.55	61.61	47.74	39.27	33.29	22.31	18.26
1.80V	991.78	625.34	412.66	312.09	253.15	146.80	107.04	85.54	71.09	61.61	47.62	39.07	33.29	21.73	18.26
1.83V	957.09	574.49	409.20	302.85	242.74	145.65	104.03	82.65	70.28	59.65	47.62	37.91	32.71	21.50	18.15
1.85V	886.58	561.76	380.29	291.31	235.81	142.18	101.14	81.61	68.31	58.49	45.78	37.57	32.13	21.27	18.03

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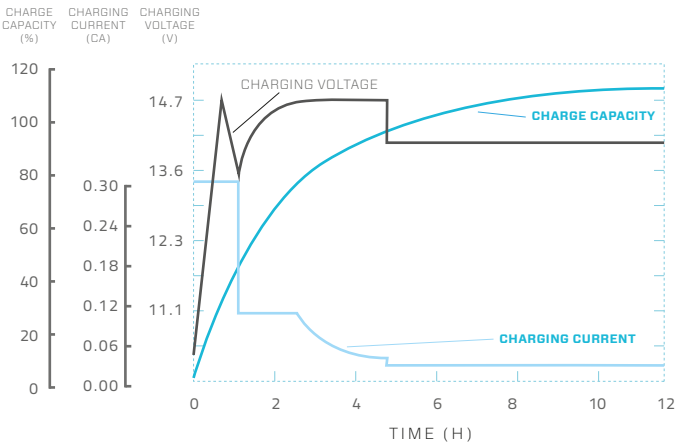
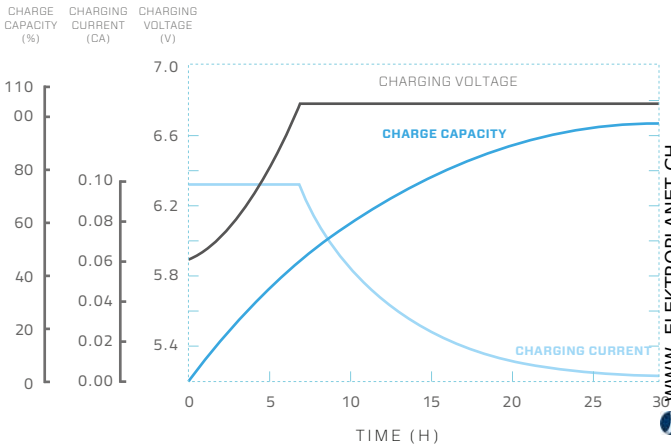
CYCLE CHARGE CHARACTERISTIC (25°C)

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



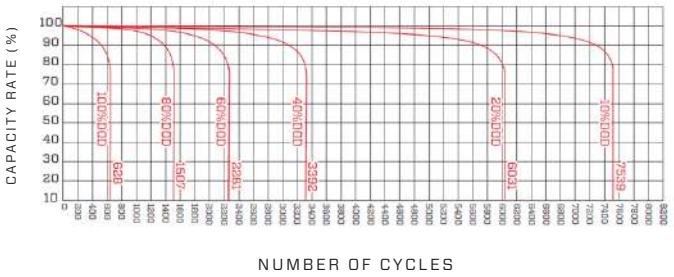
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

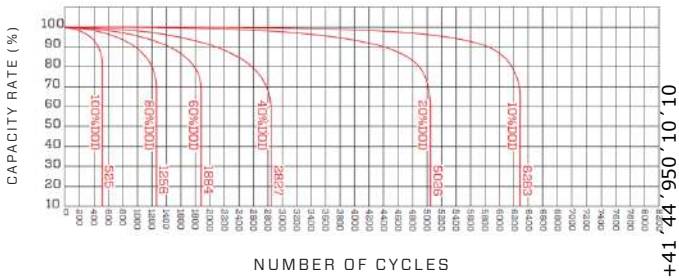


CYCLE LIFE CURVE GRAPH

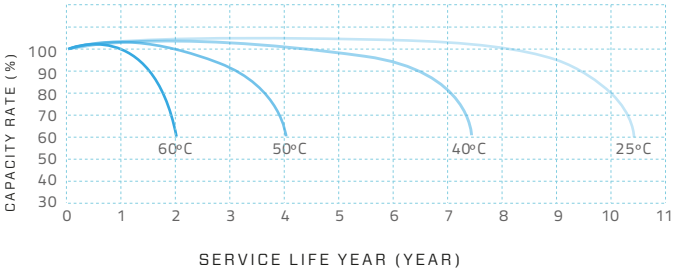
CYCLE LIFE CURVE GRAPH (25°C)



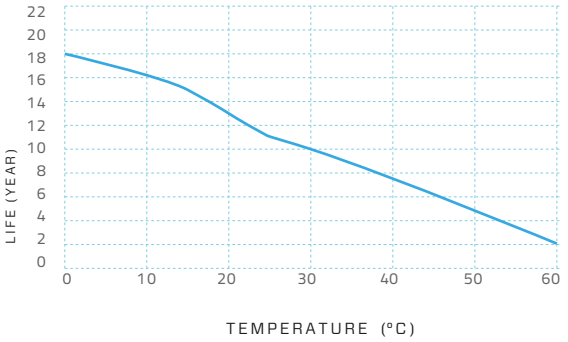
CYCLE LIFE CURVE GRAPH (40°C)



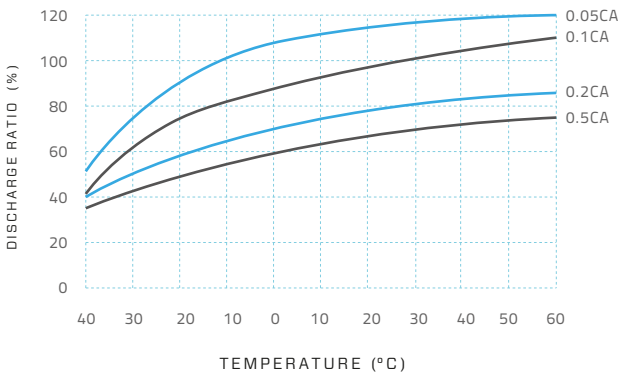
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



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