

the power of tomorrow

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

**LEAD
CRYSTAL®
BATTERIES**

POWERED BY
Betta Batteries



SPECIFICATION

| | | | |
|-------------------------------|--------------------------------|--------|--------|
| Nominal Voltage | 12V | | |
| Rated Capacity (10 hour rate) | 155 AH | | |
| Dimension | Total Height (top of terminal) | 283 mm | 11.14" |
| | Height | 283 mm | 11.14" |
| | Length | 559 mm | 22.00" |
| | Width | 125 mm | 4.92" |

| | | | |
|--------|-------------------------------|--|--|
| Weight | Approximately 45kg / 99.20lbs | | |
|--------|-------------------------------|--|--|

| | | |
|---------------|-----------------------|--------|
| Capacity 25°C | 120 hour rate (1.55A) | 186 AH |
| | 20 hour rate (8.5A) | 170 AH |
| | 10 hour rate (15.5A) | 155 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% |

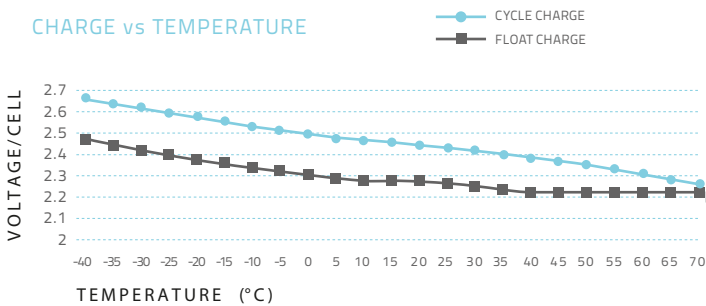
| | | |
|----------------------------|------------|--|
| Max Discharge Current 25°C | 1550A (5S) | |
|----------------------------|------------|--|

| | | |
|-----------------------------|----------|---|
| Terminal | Standard | F4 |
| | Optional | |
| Charging (Constant Voltage) | Cycle | Initial Charging Current 46.5A 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 (voltage/cell) | 2.66 | 2.64 | 2.62 | 2.60 | 2.58 | 2.56 | 2.54 | 2.52 | 2.50 | 2.48 | 2.47 | 2.47 | 2.45 | 2.45 | 2.43 | 2.41 | 2.39 | 2.37 | 2.35 | 2.33 | 2.31 | 2.29 | 2.27 |
| Float Charge (voltage/cell) | 2.46 | 2.44 | 2.42 | 2.40 | 2.38 | 2.36 | 2.34 | 2.32 | 2.31 | 2.30 | 2.29 | 2.29 | 2.29 | 2.27 | 2.26 | 2.24 | 2.23 | 2.23 | 2.23 | 2.23 | 2.23 | 2.23 | 2.23 |

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

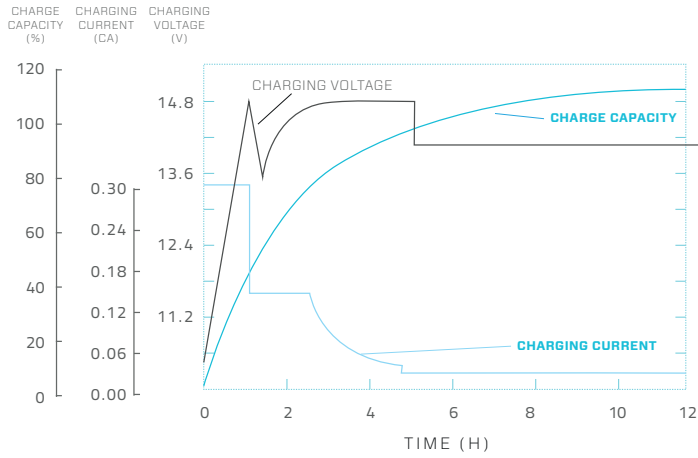
| End Voltage per cell | 5min | 15min | 30min | 45min | 1h | 2h | 3h | 4h | 5h | 6h | 8h | 10h | 12h | 20h | 24h |
|----------------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| 1.60V | 568.79 | 301.01 | 181.88 | 132.60 | 106.80 | 61.19 | 44.44 | 34.85 | 29.73 | 25.27 | 19.26 | 16.04 | 13.46 | 8.76 | 7.16 |
| 1.67V | 528.61 | 291.15 | 179.18 | 131.69 | 106.61 | 60.93 | 43.63 | 34.67 | 29.30 | 25.09 | 19.24 | 15.86 | 13.44 | 8.74 | 7.13 |
| 1.70V | 523.22 | 286.69 | 177.38 | 129.91 | 105.73 | 60.39 | 43.36 | 34.49 | 28.85 | 24.82 | 19.17 | 15.86 | 13.40 | 8.71 | 7.12 |
| 1.75V | 479.32 | 277.70 | 175.62 | 129.02 | 103.93 | 59.22 | 43.18 | 34.06 | 28.58 | 24.64 | 19.08 | 15.68 | 13.33 | 8.67 | 7.11 |
| 1.80V | 430.03 | 259.78 | 168.42 | 125.43 | 101.24 | 58.33 | 43.01 | 33.96 | 28.22 | 24.37 | 18.99 | 15.50 | 13.26 | 8.38 | 7.10 |
| 1.83V | 411.06 | 238.33 | 165.76 | 120.96 | 96.77 | 57.79 | 41.30 | 32.52 | 27.60 | 23.47 | 18.59 | 14.87 | 12.72 | 8.29 | 7.00 |
| 1.85V | 385.21 | 231.14 | 155.00 | 116.48 | 94.07 | 55.46 | 40.23 | 32.07 | 26.88 | 22.70 | 18.37 | 14.69 | 12.54 | 8.20 | 6.94 |

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 | 950.45 | 528.54 | 340.42 | 248.14 | 199.62 | 115.56 | 84.48 | 66.92 | 56.53 | 48.55 | 37.45 | 31.00 | 26.07 | 17.38 | 14.24 |
| 1.67V | 904.78 | 520.48 | 326.65 | 246.36 | 199.77 | 115.56 | 83.40 | 66.83 | 56.53 | 48.46 | 37.45 | 30.91 | 26.07 | 17.38 | 14.24 |
| 1.70V | 899.40 | 516.89 | 326.50 | 246.36 | 197.97 | 114.67 | 83.22 | 66.58 | 55.63 | 48.11 | 37.18 | 30.64 | 25.80 | 17.29 | 14.24 |
| 1.75V | 837.60 | 510.62 | 326.86 | 246.35 | 197.08 | 113.77 | 83.05 | 66.47 | 55.45 | 47.75 | 37.00 | 30.43 | 25.80 | 17.29 | 14.15 |
| 1.80V | 768.63 | 484.64 | 319.81 | 241.87 | 196.19 | 113.77 | 82.95 | 66.29 | 55.09 | 47.75 | 36.91 | 30.28 | 25.80 | 16.84 | 14.15 |
| 1.83V | 741.74 | 445.23 | 317.13 | 234.71 | 188.12 | 112.87 | 80.62 | 64.05 | 54.47 | 46.23 | 36.91 | 29.38 | 25.35 | 16.66 | 14.06 |
| 1.85V | 687.10 | 435.37 | 294.73 | 225.76 | 182.75 | 110.19 | 78.39 | 63.25 | 52.94 | 45.33 | 35.48 | 29.11 | 24.90 | 16.48 | 13.98 |

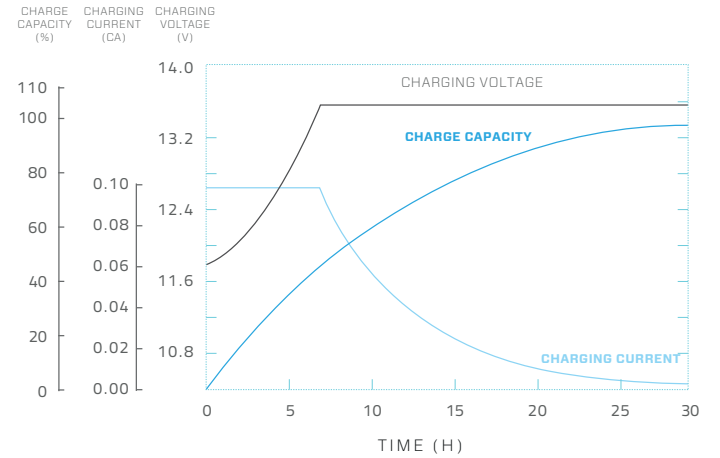
CYCLE CHARGE CHARACTERISTIC (25°C)

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



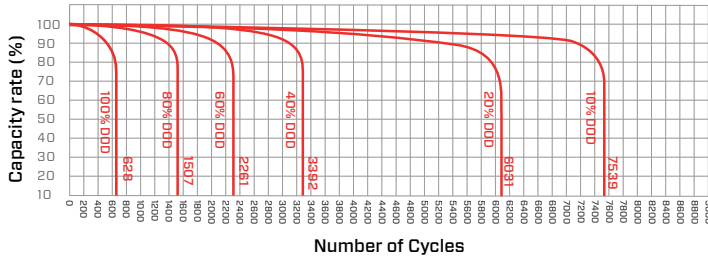
FLOATING CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

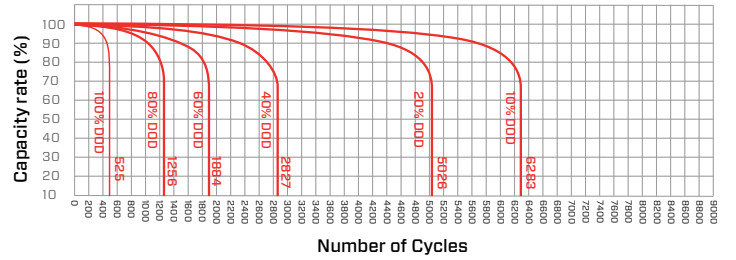


CYCLE LIFE CURVE GRAPH

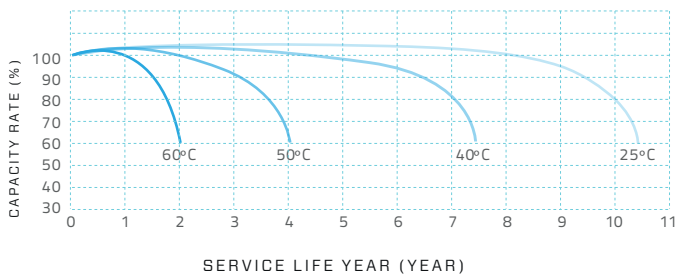
Cycle life curve graph (25°C) 12V



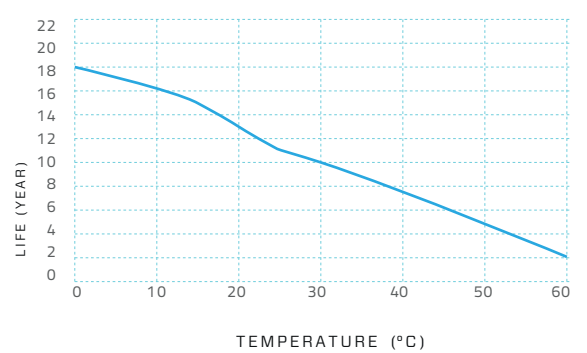
Cycle life curve graph (40°C) 12V



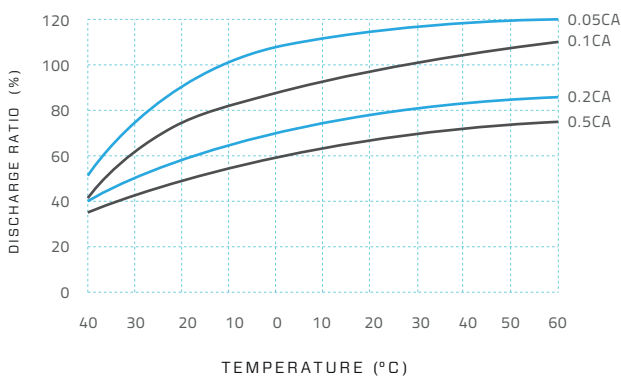
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



LEAD CRYSTAL®: CHANGING THE FUTURE

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

Technology A unique micro-porous high absorbent mat (AGM), high-purity lead calcium selenium plates, safe SiO₂ electrolyte solution that solidifies into a white crystalline powder when charged/discharged.

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

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

