

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

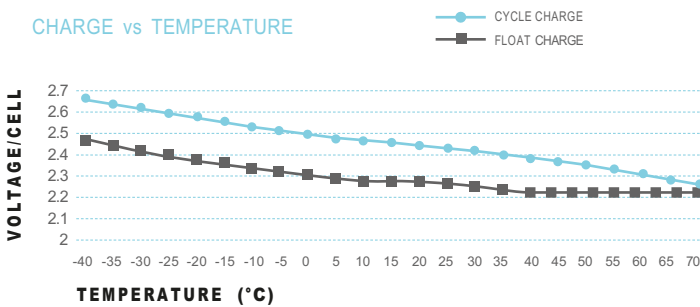
LEAD CRYSTAL[®] BATTERIES



DISCHARGE CURRENT AND END VOLTAGE

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

CHARGE vs TEMPERATURE



CHARGE vs TEMPERATURE CHART

| temperature | -40 | -35 | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Cycle Charge | 2.66 | 2.64 | 2.62 | 2.60 | 2.58 | 2.56 | 2.54 | 2.52 | 2.50 | 2.48 | 2.47 | 2.47 | 2.45 | 2.45 | 2.43 | 2.41 | 2.39 | 2.37 | 2.35 | 2.33 | 2.31 | 2.29 | 2.27 | |
| Float Charge (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 | 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 |

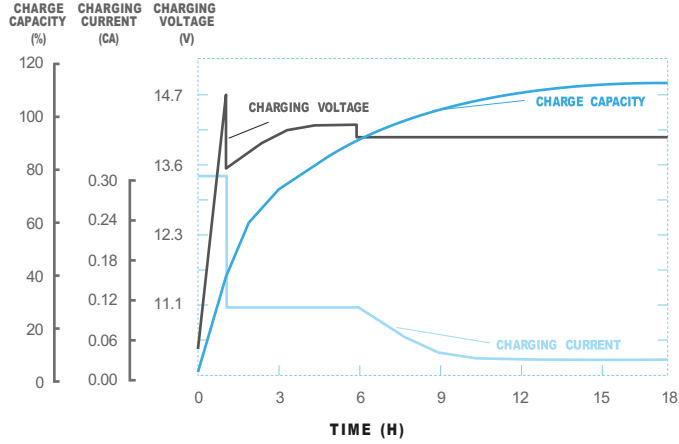
SPECIFICATION

| | | | |
|-------------------------------|----------------------------------|--|-------|
| 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 | 120 hour rate (220mA) | 26.4 AH | |
| 25°C | 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°C) | |
| | Float | 13.6V/ (25°C) | |

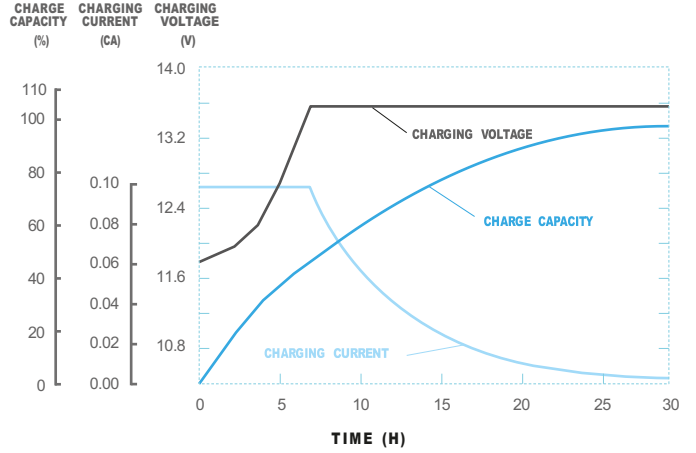
CYCLE CHARGE CHARACTERISTIC (25°C)

FLOATING CHARGE CHARACTERISTIC (25°C)

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

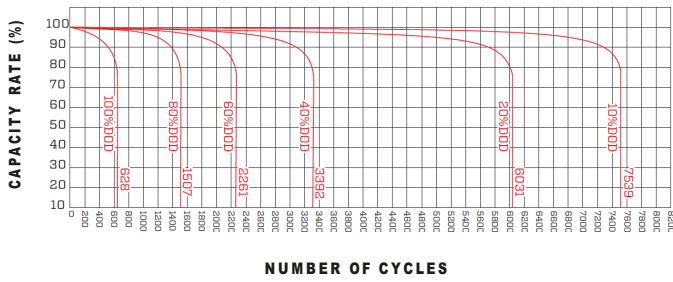


FLOATING CHARGE CHARACTERISTICS 77°F (25°C)

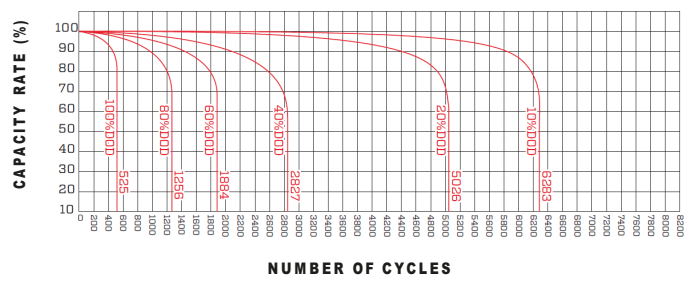


CYCLE LIFE CURVE GRAPH

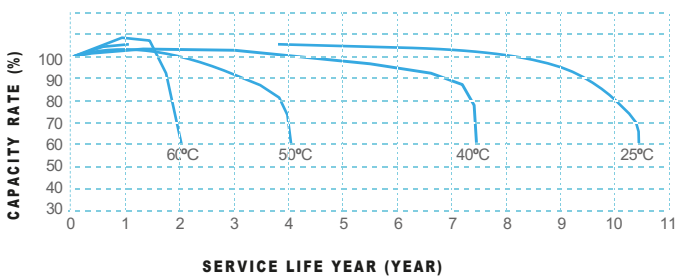
CYCLE LIFE CURVE GRAPH (25°C)



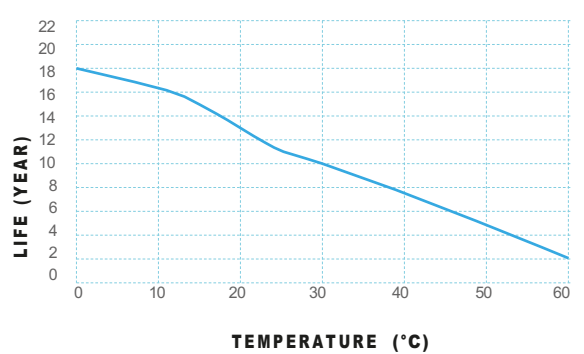
CYCLE LIFE CURVE GRAPH (40°C)



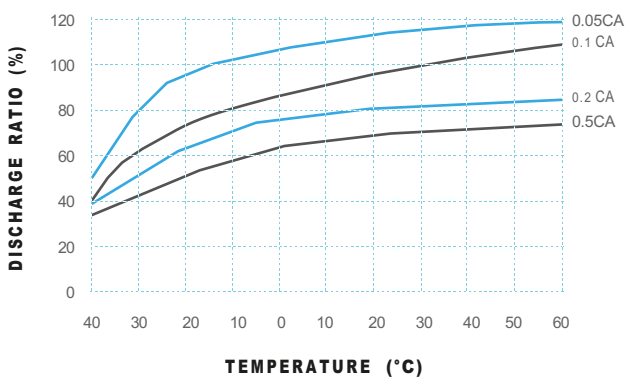
TEMPERATURE & FLOAT SERVICE LIFE



FLOAT SERVICE LIFE CURVE GRAPH



TEMPERATURE & DISCHARGE CAPACITY



6-CNFJ-22 12V/22Ah

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).

