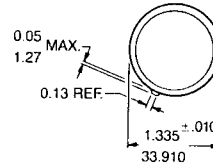
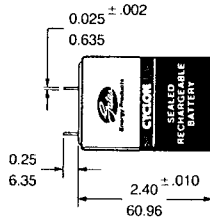
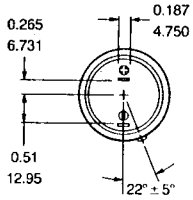


# Mechanical Specifications

# 254916  
# 254924

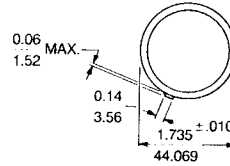
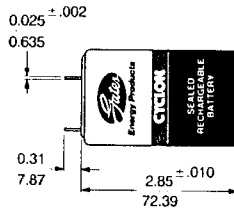
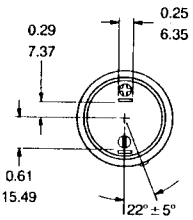
## D Cell



Length 2.650 in./67.31 mm  
 Width (dia.) 1.335 in./33.91 mm  
 Weight 6.4 oz./182 gm  
 Tabs 0.187 in. × .025 in.  
 4.750mm × 0.635mm  
 Tolerance .xx ± .010 .xxx ± .005  
 (unless noted)

U.S. Patent Numbers 3,704,173-3,862,861

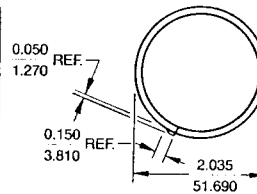
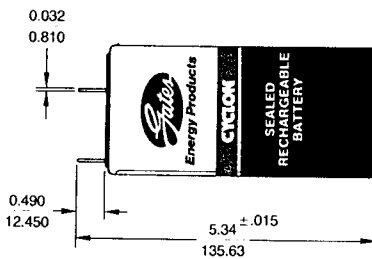
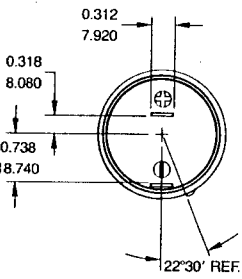
## X Cell



Length 3.160 in./80.26 mm  
 Width (dia.) 1.735 in./44.07 mm  
 Weight 13.0 oz./369 gm  
 Tabs 0.250 in. × 0.025 in.  
 6.350mm × 0.635mm  
 Tolerance .xx ± .010 .xxx ± .005  
 (unless noted)

U.S. Patent Numbers 3,704,173-3,862,861

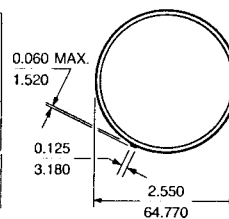
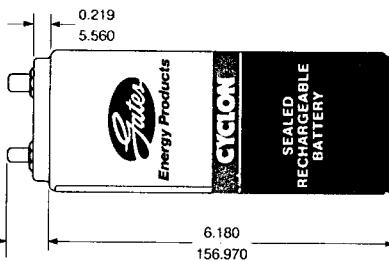
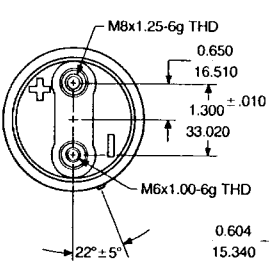
## J Cell



Length 5.340 in./135.63 mm  
 Width (dia.) 2.035 in./51.69 mm  
 Weight 1.85 lb./84 kg  
 Tabs 0.312 in. × 0.032 in.  
 7.92 mm × 0.81 mm  
 Tolerance .xx ± .010 .xxx ± .005  
 (unless noted)

U.S. Patent Numbers 3,862,861-3,839,093

## BC Cell



Length 6.784 in./172.31 mm  
 Width (dia.) 2.550 in./64.77 mm  
 Weight 3.490 lbs./1.58 kg  
 Studs M6 × 1-6g THD  
 M8 × 1.25-6G THD  
 Tolerance ± .020 in.  
 (unless noted)

U.S. Patent Numbers 3,862,861-3,839,093

Typical Specifications (Ta = 25°C)	D Cell – 2.5Ah	X Cell – 5.0Ah	J Cell – 12.5Ah	BC Cell – 25.0Ah
<b>Product Number</b>	0810-0004	0800-0004	0840-0004	0820-0004
<b>Capacity Rating</b>				
20 hour rate	2.7Ah (125mA)	5.2Ah (250mA)	13.0Ah (625mA)	26.0Ah (1.25A)
10 hour rate	2.5Ah (250mA)	5.0Ah (500mA)	12.5Ah (1.25A)	25.0Ah (2.50A)
1 hour rate	1.8Ah (2.5A)	3.2Ah (5A)	9.0Ah (12.5A)	17.5Ah (25.0A)
<b>Cell Power Rating</b>				
Peak Power	(@135A)135W	(@200A)200W	(@350A)325W	(@600A)600W
Energy/Unit Volume (@ C/10 rate)	1.47 W-h/in <sup>3</sup>	1.48 W-h/in <sup>3</sup>	1.48 W-h/in <sup>3</sup>	1.47 W-h/in <sup>3</sup>
	0.09 W-h/cm <sup>3</sup>	0.09 W-h/cm <sup>3</sup>	0.09 W-h/cm <sup>3</sup>	0.09 W-h/cm <sup>3</sup>
Energy/Unit Weight (@ C/10 rate)	12.5 W-h/lb	12.3 W-h/lb	13.5 W-h/lb	14 W-h/lb
	27.5 W-h/kg	27.17 W-h/kg	29.7 W-h/kg	31 W-h/kg
<b>Internal Resistance</b> (max. for a charged cell)	10x10 <sup>-3</sup> ohms <small>Measured on Hewlett-Packard 4328A milliohm meter.</small>	6x10 <sup>-3</sup> ohms	4x10 <sup>-3</sup> ohms	2.2x10 <sup>-3</sup> ohms
<b>Nominal Cell Voltage</b>	2.0V	2.0V	2.0V	2.0V
<b>Cell Temperature Range</b>	Storage Discharge Charge	-65°C to +65°C -65°C to +65°C -40°C to +65°C		
<b>Storage Time</b>	Ta = 0°C Ta = 23°C Ta = 65°C	7,200 days 1,200 days 60 days		
<b>Atmospheric Pressure Range</b>	0-8 Atmospheres			
<b>Cell Charging</b>	Constant Voltage cyclic float Constant Current cyclic, maximum float, maximum	2.40-2.60V 2.30-2.40V C/3 rate for D, X, J cells, C/5 rate for BC cells C/500 rate		
<b>Cycle Life</b>	200-2,000 cycles <small>200 cycles — 100% depth of discharge, one cycle per day (Charge: 2.45V constant voltage, no current limit; Discharge: C/5 rate); 2000 cycles — 25% depth of discharge (Charge: 2.45V/cell for 7.5 hrs. — 2.0A current limit; Discharge: C/2 rate for 30 min); More cycles are available with shallower discharges.</small>			
<b>Expected Float Life</b>	8 years	<small>Based on accelerated test methods, 2.35 volts constant voltage charge at 23°C ambient temperature.</small>		

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# Performance Characteristics

## 1 Discharge Characteristics

The discharge current as a function of time curves indicate the high current capabilities for the D, X, J, and BC cells.

## 2 State of Charge

The open circuit voltage of the Gates cell enables its state of charge to be determined quickly and easily.

## 3 Storage Characteristics

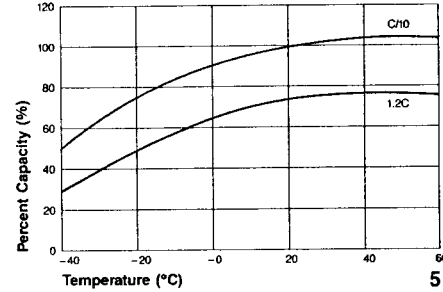
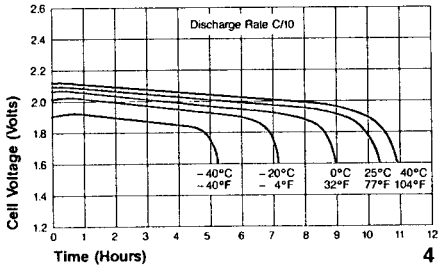
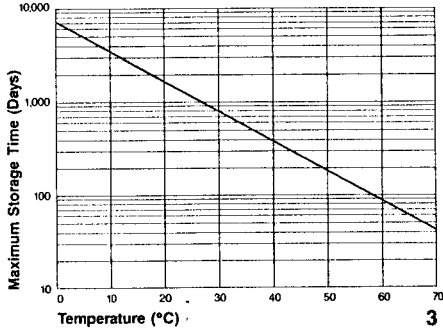
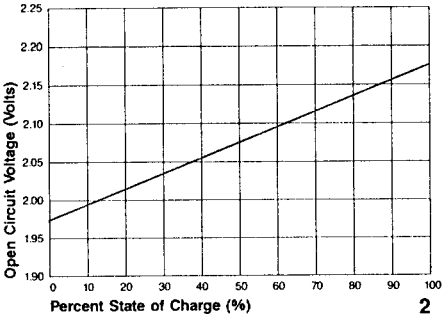
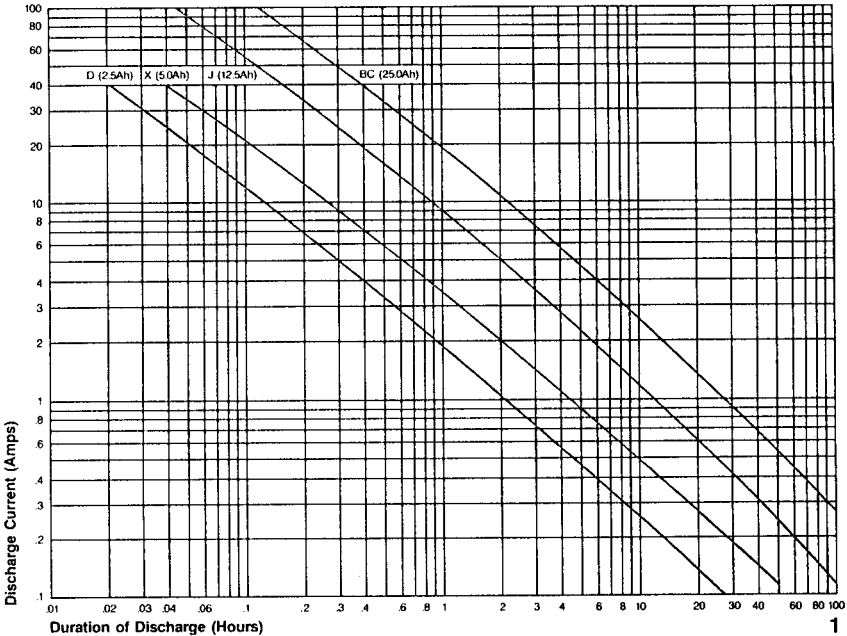
The Gates cell may be stored up to three years at room temperature. Storage time is dependent on the storage temperature as shown in this maximum allowable storage time versus temperature curve for a charged cell.

## 4 Voltage Regulation

The voltage regulation of the Gates cell is equal to or better than any other commercially available system. Typical curves shown.

## 5 Temperature Characteristics

This graph illustrates the excellent capacity available in the cell as a function of temperature at two different discharge rates.



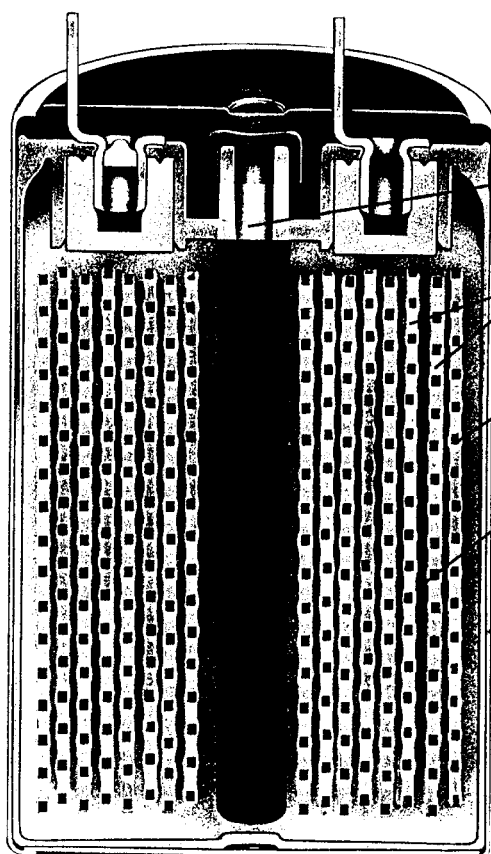
# Gates Long-life, Maintenance-free Rechargeable Battery

The dynamic pace of development in electronics today demands stringent requirements of the equipment's power supplies. New technology can present special and often unconventional requirements for the battery.

The unique construction and design flexibility of the Gates Cyclon cell offers innovative solutions for today's battery applications. The problems associated with conventional batteries can be solved with the Gates sealed, rechargeable lead-acid batteries.

The patented starved electrolyte system allows recombination of gases to prevent water loss and the venting of acid vapor effectively ending terminal corrosion present with most lead-acid batteries. The unique starved electrolyte system provides numerous performance advantages over the conventional designs:

- Float life of 8-10 years at 23°C before falling to 80% of rated capacity
- Absolutely no "memory" effects
- Safe charging and discharging in any position, even near electronic circuitries
- A self-resealing safety valve which will vent under overcharge conditions
- Cycle life of 200-2000 cycles, depending on depth of discharge
- Excellent mechanical and vibrational strength
- Impressive low-temperature performance — At -40°C, Gates Cyclon delivers 50% of C/10 room temperature capacity
- Storage life of up to 3 years at room temperature without recharging or damage



#### **Safety Vent**

Allows for very abusive overcharge or charger failure without cell rupture.

#### **Positive and Negative Plates**

Spirally-wound to yield high discharge capacity, even at high rates.

#### **Pure Lead Grids**

Give excellent corrosion resistance and low internal impedance.

#### **Highly Retentive Separator**

Retains essentially all of the electrolyte.

#### **Rugged Metal Can Enclosure**

No acid or acid vapor is vented from the cell. Gas is recombined directly with the plate materials at up to the C/3 rate of overcharge. The metal can protects the cell from physical damage.