Just Imagine What These Silvercel® Advantages Can Do For Your Application

- **LIGHTWEIGHT** — Silvercels weigh anywhere from one-third to one-fifth that of nickel-cadmium and lead-acid cells of a comparable energy output.
- **COMPACT** — Depending on size and conditions of use, to do the same job, our silver-zinc cells will only require one-half to one-fourth the space of the other widely used rechargeable cells.
- **POWERFUL** — Silvercels can be discharged at tremendously high rates. This combined with their high energy output, makes them ideal for such high-rate applications as missiles, space launch vehicles, torpedoes and torpedo targets.
- **STABLE VOLTAGE** — Because the impedance characteristics of the silver electrode vary little with the state of charge, a stable operating voltage is provided until nearly all the capacity is withdrawn.
- **SAFE** — We are very proud of the fact that our silver-zinc cells have not ever caused or contributed to any serious accident
- **RELIABLE** — Silvercels have been used on dozens of critical man-rated applications, such as the Extravehicular Mobility Unit (EMU), Manned Maneuvering Unit (MMU), NR1 and DSRV submersibles.
- **RUGGED** — Can be used on applications with very demanding dynami exposures as evidenced by their widespread end use on so many missile an space launch vehicle applications.
- **RECHARGEABLE** — Can provide hundreds of charge/discharge cycles unde ideal operating conditions.
- **WIDE SELECTION OF SIZES** — Available in an almost endless variety o ampere-hour sizes and prismatic shapes. Many other cells (0.1 to 20,000 amper hours) are available in addition to the "standard models" listed in this brochure.
- **VARIETY OF CELL TYPES** — Come in three distinct classes of cells: "LR for maximum cycle and wet life, "HR" for greater high rate capability, and "PM to optimize rate capability for applications not requiring many cycles or a extensive activated life.
- **PACKAGING ADAPTABILITY** — With the variety of sizes, shapes an types, the individual cell concept allows you to arrange series strings of cells t provide any voltage desired.
- **CUSTOMIZED CELL DESIGNS** — In addition to the cells listed in thi brochure, for optimized performance, Yardney routinely provides customize cell pack designs for any cell size.

Characteristics of Yardney Silvercels®
LR, HR, & PM Series Silver-Zinc Cells

LR: Long Life, Low Rate

HR: Medium Life, High Rate

PM: Limited Life, Optimum Performance

Energy Output: 40-90 watt-hours per pound and 2.5-8.0 watt-hours per cubic inch, depending on cell type, model and conditions of use; as much as 120 watt-hours per pound and 11.0 watt-hours per cubic inch for certain special models and applications. *

Power Output: From 50-150 watts per pound and 4-10 watts per cubic inch (continuously) for "LR" Type Cells, to 150-500 watts per pound and 10-35 watts per cubic inch (continuously) for "PM" Type Cells. On an intermittent basis, values two times the indicated power output are possible (i.e., 1000 watts per pound and 70 watts per cubic inch). *

Open-Circuit Cell Voltage: 1.82-1.86 volts when fully charged, 1.61-1.63 volts when partially discharged.

Nominal Voltage Under Load: 1.5 volts.

Plateau Voltage Regulations: ±2% at a fixed load and temperature limits with = 10°F.

Cycle Life: Typical number of charge/discharge cycles is as follows:

LR Series		100-250 cycles **
HR Series	1-hour rate	25-50 cycles
	30-minute rate	20-40 cycles
	10-minute rate	10-20 cycles
PM/PML Series		1-10 cycles

Operating Life:

LR — 1-3 years **
HR — 6 to 18 months
PM/PML — 15 to 90 days

Dry Storage Life: Up to 25 years

Gassing on Discharge or Stand: Negligible

Storage Temperature Range: Wet: +120°F to –40°F; down to –65°F with heaters. For optimum cell performance, from +135°F to +50°F.

Operational Temperature Range: +165°F to –10°F; down to –65°F with heaters. For optimum cell performance, from +135°F to +50°F.

Charging Time: Can be fully recharged within 10 hours, depending on requirements and type of cell.

Charge Completion: Indicated by sharp rise in cell voltage during charge. Recommended charge termination is at 2.0 volts per cell.

Charge Retention: Up to 85% of capacity after 3 months charged stand at room temperature.

* For special demanding applications, custom designs can provide superior performance. Contact Technical Sales Group (taretakis@yardney.com).

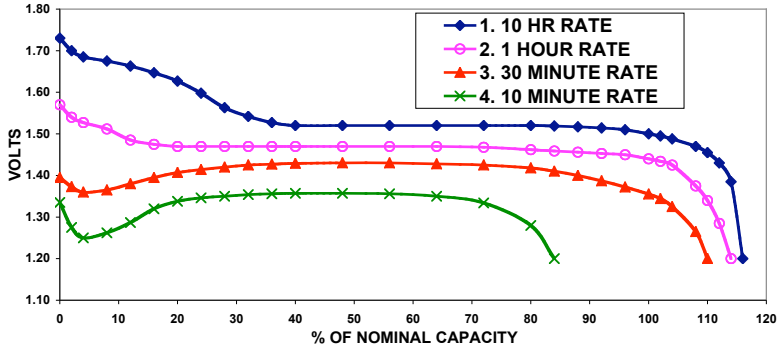
** Performance depends on depth of discharge and other operating conditions. For applications requiring longer life—rugged, rechargeable YARDNEY SILCAD cells are available. Typically, more than 500 complete charge/discharge cycles or 3,000 partial cycles over a three-year wet life are achieved. Literature available.

Cells should be stored discharged at low temperature (30°F).
These data apply mainly to individual cells. When the cells are assembled to form batteries, performance will be determined by specific application and packaging requirements.

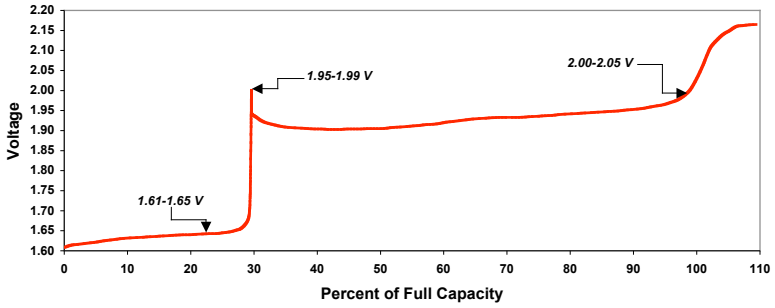
NOTE: The data in this brochure represents general performance characteristics of cells of the silver-zinc alkaline system and should be regarded only as a guide.

Some cell models were designed for special purposes and are capable of exceeding the parameters indicated by the nominal ratings. Further, the performance of cells assembled into batteries is often affected by specific project and packaging requirements.

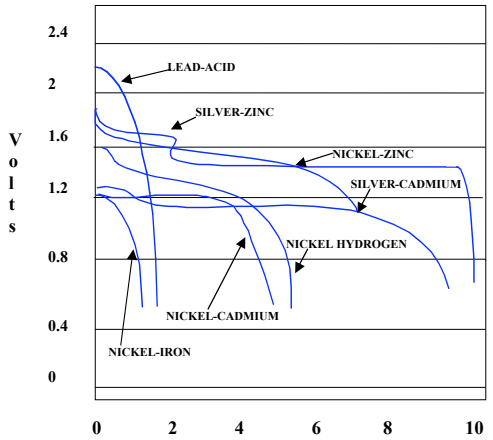
For many years, Yardney has pioneered the development of high energy, lightweight, rechargeable batteries. Yardney batteries are essential components in aircraft, missiles, torpedoes, submersibles, communications equipment, and many types of portable power supplies and instrumentation.



Typical discharge curves for the SILVERCEL system at various rates
(Flat portion of curves is referred to as "plateau voltage")



Silver-Zinc Cells, Typical Charge Curve



Typical discharge characteristics of various battery systems of equal weight discharging under the same conditions