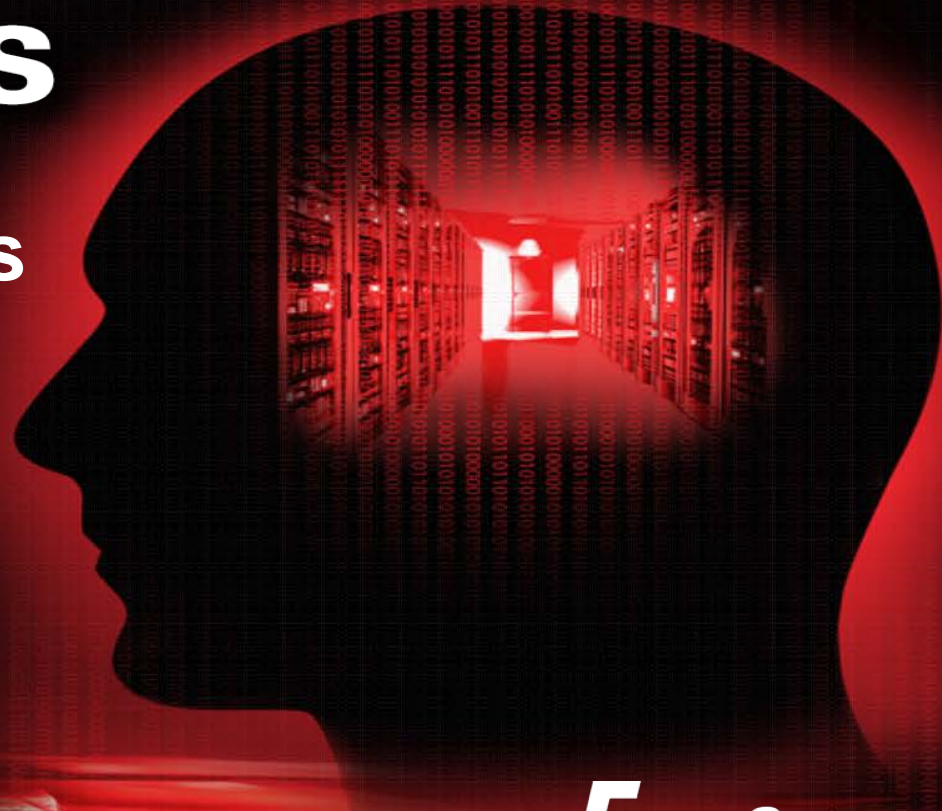


RETHINK UPS

DataSafe® XE Batteries
for the Evolving
Data Center Market



data safe® **XE**

EnerSys®
Power/Full Solutions

UPS Application Trends

- Reduced autonomies from traditional 15 minutes to <5 minutes
 - Equipment can now be shut down quicker than previously
 - Generators are ready to support the load in seconds (was minutes)
- Global data replication to reduce risks in case of unstable grid
- Reduced temperature management in battery rooms for lower TCO
- Colocation companies
 - Operators lease services from the colocation companies
 - Fixes their costs to match the lease period
 - Remove fixed assets from their books
- Containerised or modular UPS
 - Flexible solutions
 - Mobile - allows easy relocation
 - Operating at higher temperature



Implication for the Batteries

These changes in trends have led to:

- Reduced autonomies; now between 30 seconds to 5 minutes
- Longer service life at higher operating temperatures
- Reduced energy consumption
- Fast recharge times - reduce the impact of multiple power failures
- Reduced footprint - smaller battery, or more power in the same footprint
- Reduced fixed costs over a shorter amortisation cycle
- Longer shelf life for increased project deployment flexibility

Introducing DataSafe® XE Batteries by EnerSys®



Rethink UPS.

EnerSys, the global leader in stored energy solutions did.

EnerSys.
Power/Full Solutions

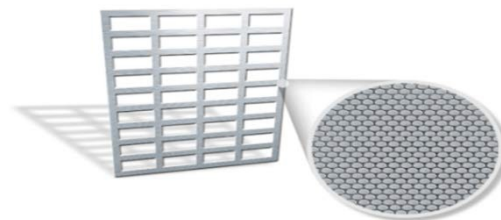
The technology behind DataSafe® XE Batteries

- Technology developed in the mid 1970's and used today in many different demanding critical applications.
- Thin Plate Pure Lead (TPPL) technology batteries require special, advanced engineering methods and manufacturing processes.
- EnerSys has customised its TPPL technology to meet the demands of the modern datacentre industry.



DataSafe® XE Batteries – Advanced Process

- These batteries are produced using EnerSys' renowned manufacturing process and years of experience
 - Eliminates structural weakness of book-mold cast grids
 - Provides for an increase in plate consistency
 - Molecular “optimization” of grain structure
 - TPPL technology results in thinner plates, allowing more plates to be placed within the container
 - More plates means more surface area
 - Higher energy density
 - Drastically lowers resistance

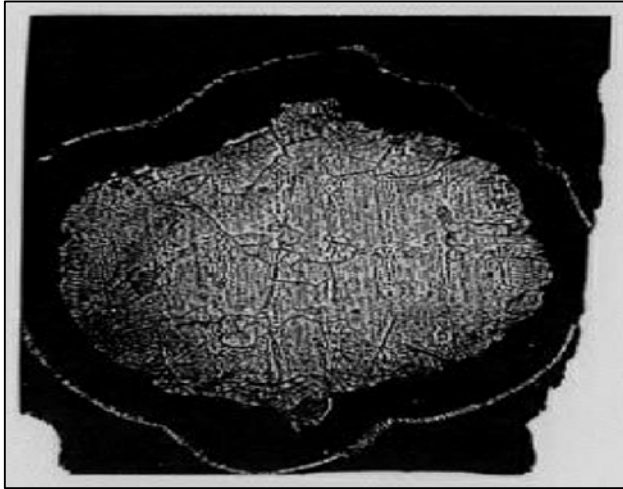


DataSafe® XE Batteries – Benefits v PbCa

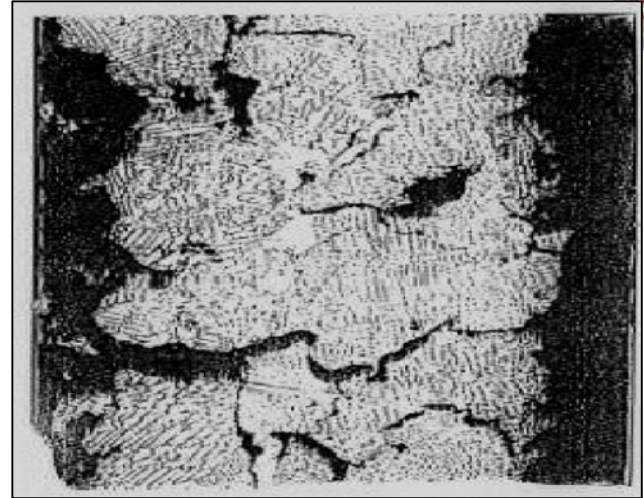
- Specification of high purity, high grade materials in the manufacturing of DataSafe XE batteries:
 - ✓ Low self-discharge delivers -
 - longer storage life (17 months vs 6 months)
 - ✓ Low corrosion rate results in -
 - longer life (25% longer than standard AGM)
 - ✓ Low float current therefore -
 - less energy consumption and reduced OPEX

Advantages of TPPL Grid Technology

Grain structure - note consistency of TPPL vs PbSnCa



**Thin Plate Pure
Lead (TPPL)**



**Lead Tin Calcium
(PbSnCa) Alloy** **EnerSys.**

Advantages of TPPL Grid Technology

- Positive grid corrosion can't be avoided
- However, using preventive action can slow down this process

Standard book-mold casting



PbCa Cast Grid 10 to 12 years

(operated in float mode)

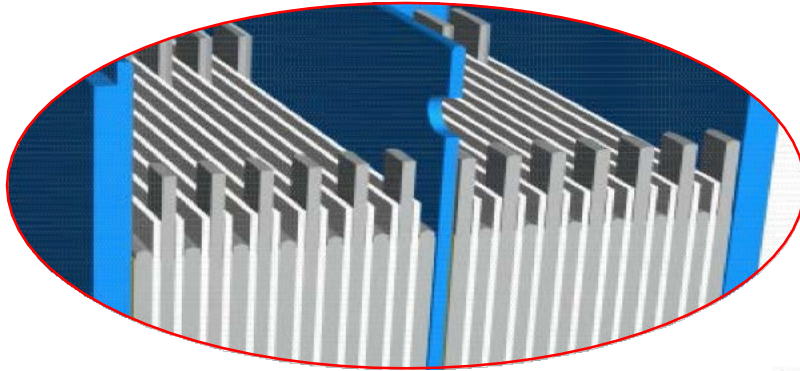


TPPL After 15 years



Advantages of TPPL Grid Technology

Standard AGM book-mold casting



13 Plates per Section

0.5m²

550Wpc

(15min to 1.67Vpc @ 25°C)

21 Plates per Section

0.8m²

706Wpc

(15min to 1.67Vpc @ 25°C)

The TPPL technology within DataSafe XE blocs features a higher

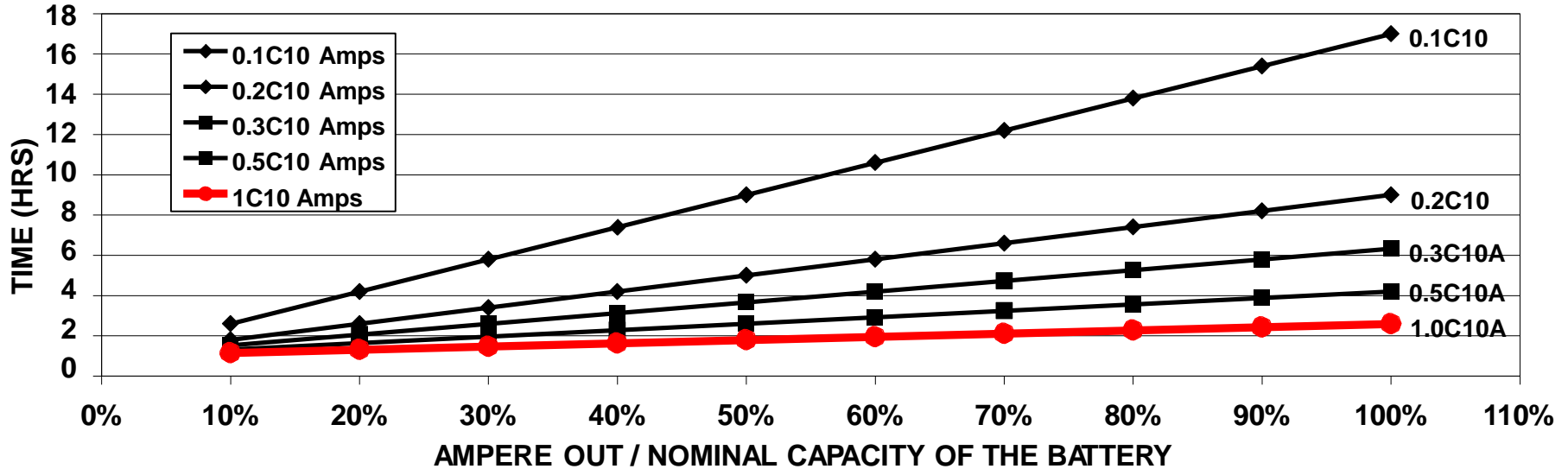
plate count than standard AGM book-mold cast products of equivalent sizes.

This larger surface area delivers more Watts per Cell than in equivalent-size containers



Fast Recharge

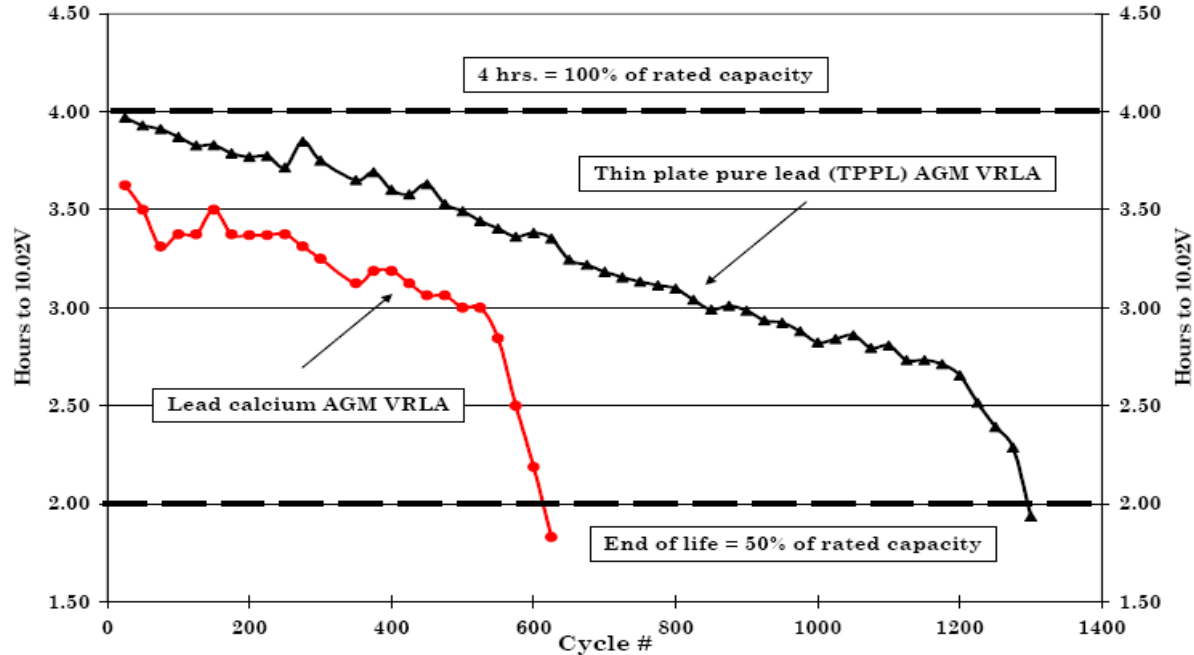
TIME TO FULL STATE OF CHARGE AS A FUNCTION OF CURRENT LIMIT AND DEPTH OF DISCHARGE at 2.40Vpc



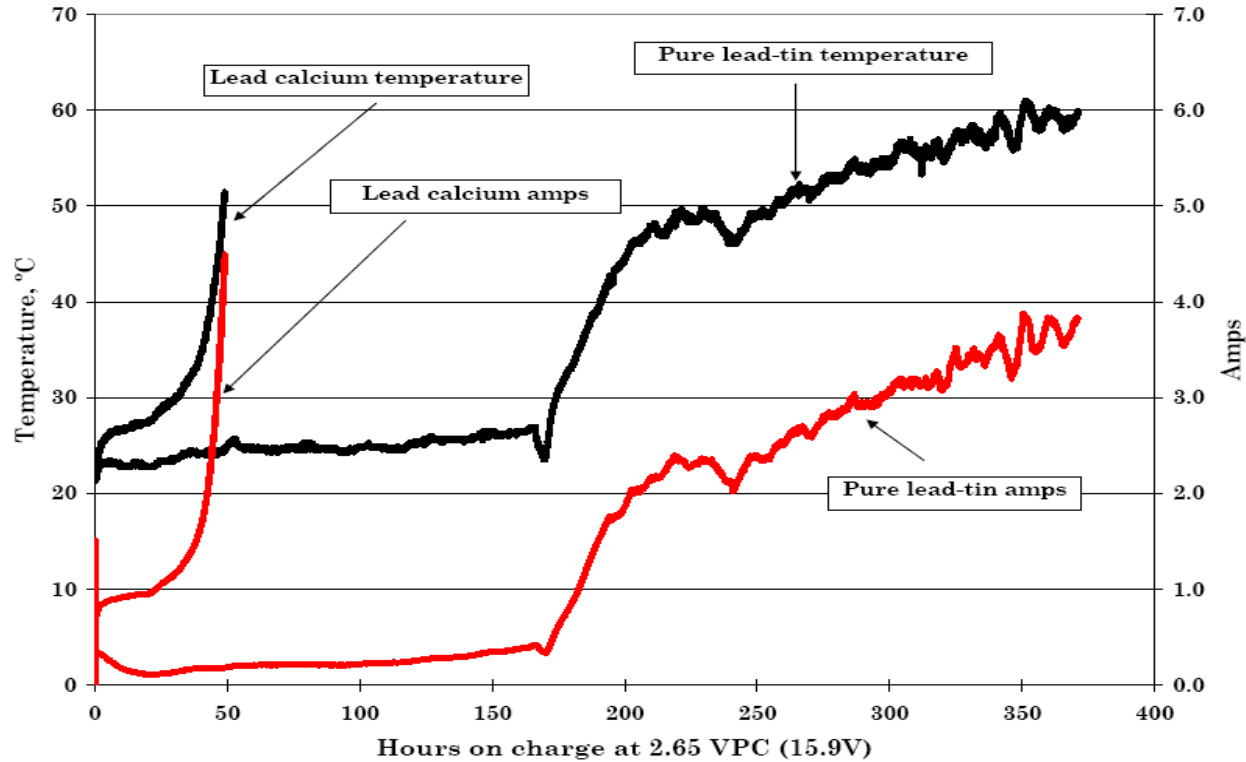
- Traditional Lead Calcium batteries are typically limited to 0.25C₁₀ Amps charge current which prevents fast recharge. The higher recharge currents employed with DataSafe XE makes faster recharge possible

Cycle life comparison

Discharge: 0.25 X C20 amps for 2 hours
Charge: CC @ 0.1 X C20 amps for 6 hrs.
Full discharge every 25th. cycle @ 0.25 X C20 to 10.02V
Recharge after full discharge: CC 0.1 X C20 amps for 10 hrs.



Thermal runaway comparison



Why Choose DataSafe® XE batteries?

- Specifically designed for <5 minute rate discharges in UPS applications
- Fast recharge capability to support multiple power failures
 - Network support / scheduled outages
 - Minimum time to recharge for repeat duty
- Wide operating temperature range (-40°C to +50°C) and stability at high temperatures
- Excellent warranty at elevated temperatures
- Reduced Total Cost of Ownership
- High power density at short run times in industry standard footprints - more power in the same space or smaller battery for equivalent power
- Low operating expense due to reduced cooling costs and low float current
- Long storage/shelf life for maximum flexibility in project deployment
- Pure lead technology for longer life at elevated temperatures
- Eurobat's "very long life" classification (>12 years @ 20°C)
- Front terminal design available for ease of installation and maintenance

Why Choose DataSafe® XE batteries?



DataSafe XE satisfies the marketplace trends and needs, and offers users the best value!