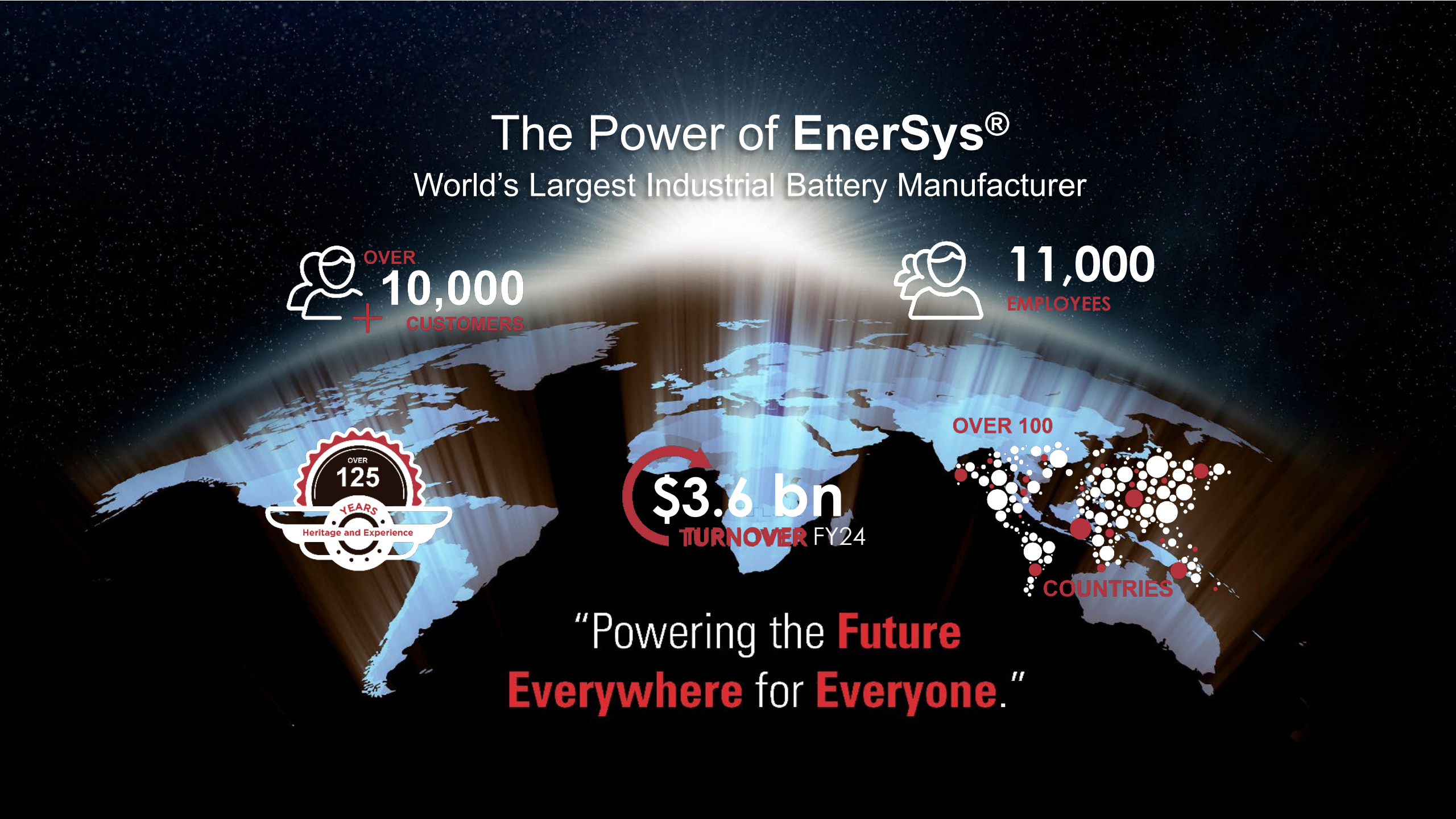
EnerSys
Specialty / Advanced Systems

March 2025

The Power of **EnerSys®**

World's Largest Industrial Battery Manufacturer



"Powering the **Future**
Everywhere for **Everyone**."

ENERSYS GLOBAL

LINES OF BUSINESS

$1.6B FY'24 Revenue

Energy Systems

$1.4B FY'21 Revenue

Energy Systems focuses on the telecommunication and broadband, utility industries, renewables, and data center applications requiring stored energy solutions

$1.5B FY'23 Revenue

Motive Power

$1.2B FY'21 Revenue

Motive Power batteries are utilized in electric forklift trucks, mining ,and other commercial electric powered vehicles

$0.5B FY'23 Revenue

Specialty

$0.4B FY'21 Revenue

Specialty segment provides energy storage solutions to the aerospace and defense, transportation, and medical device industries

ENERSYS ADVANCED SYSTEMS

SPECIALTY GROUP

SPACE

- Advanced Lithium-Ion batteries
- Over 6.8 billion cell hours in space without a failure

AIR

- Valve Regulated Lead Acid (VRLA) and Nickel-Cadmium (Ni-Cd)
- Supplier to Airbus, Boeing, Bombardier, Learjet and many others

LAND

- Advanced Thin Plate Pure Lead VRLA AGM batteries
- Over 3 Million Hawker ARMASAFE batteries sold globally

Thin Plate Pure Lead MANUFACTURING LOCATIONS

ISO 9001 - ISO 14001 - ISO 45001

Newport
South Wales, UK

Arras
Northern France

Warrensburg
Missouri, USA

Springfield
Missouri, USA

ODYSSEY® BATTERY

A battery for every application

Automotive & Light Commercial Vehicle
Motorsports & Motorbikes
Marine & Leisure
Heavy Truck

ODYSSEY® CONNECT

BATTERY MONITORING SYSTEM

The patented ‘ODYSSEY Connect’ chip technology built into the battery allows:

- ✓ Voltage measurement
- ✓ Temperature measurement
- ✓ Recording of the battery’s history
- ✓ Monitoring of the battery’s state of health
- ✓ Warning and safeguard notifications
- ✓ Capture and analysis of vehicle start data

ODYSSEY® BATTERY

ARMASAFE PLUS NATO 6T

APPLICATIONS

- MAIN BATTLE TANKS
- INFANTRY FIGHTING VEHICLES
- ARMOURED FIGHTING VEHICLES
- MILITARY TRUCKS
- HOWITZERS
- HEAVY TACTICAL VEHICLES

ARMASAFE PLUS – NATO 6T SIZE - SPECIFICATIONS

CHARACTERISTIC	BATTERY MODEL							
	12FV120	12FV120 DUTCH	12FV120 MAN	HASP-FT	BB10N	UK6TNMF	NBB248	12FV120-DT
Part Number	9750N7010	9750N7032	9750N7036	9750N7025	9750N0250	9750N7000	9750N7018	9750N7005
NSN	6140-99-690-6632	6140-17-117-7743	6140-12-369-8589	6140-01-485-1472	6140-25-139-6183	6140-99-219-2903	6140-12-190-9027	6140-99-738-0574
Typically Used By	Multinational	Netherlands	RMMV Trucks	USA	Norway	UK	Germany	Multinational
Complaint To	UK Def Stan 61-021 Supp 042, French S-CAT 20601	PVE 0126/07	UK Def Stan 61-021 Supp 042	MIL-PRF-32143, UK Def Stan 61-021 Supp 042	Norwegian Defence Standard FS6140-0809	UK Def Stan 61-021 Supp 042	VG 96924 T 09 UK Def Stan 61-021 Supp 117	UK Def Stan 61-021 Supp 042
Technology	Thin Plate Pure Lead, Absorbed Glass Mat (AGM), Valve Regulated Lead Acid (VRLA)							
Nominal Voltage	12 V							
Charging Voltage	14.4V @ 20°C							
Nominal Capacity (C20)	126 Ah	126 Ah	126 Ah	120 Ah	126 Ah	126 Ah	120 Ah	126 Ah
Nominal Capacity (C5)	103 Ah	103 Ah	103 Ah	103 Ah	103 Ah	103 Ah	100 Ah	103 Ah
CCA	1225 A (SAE)	1225 A (SAE)	1225 A (SAE)	1225 A (SAE)	1225 A (SAE)	1225 A (SAE)	1225 A (SAE)	1050 A (SAE)
L x W x H (mm)	286 x 269 x 230							
Internal Resistance	1.6 mΩ							
Temperature Range	-40°C To 80°C							
Cycle Life	3500 @ 20% Depth Of Discharge, 1650 @ 50% Depth Of Discharge, 680 @ 80% Depth Of Discharge							
Weight	40 Kg							
Battery Poles	EN50342-2 / DIN72311-4			MIL-PRF-32143	EN50342-2 / DIN72311-4			EN50342-2 + ⅜"-16 UNC Stud
Storage @ 15°C	60 Months							
Storage @ 25°C	30 Months							
Case	Stone Grey RAL 7030, Flame Retardancy UL94 V-2							

MIL PC RANGE

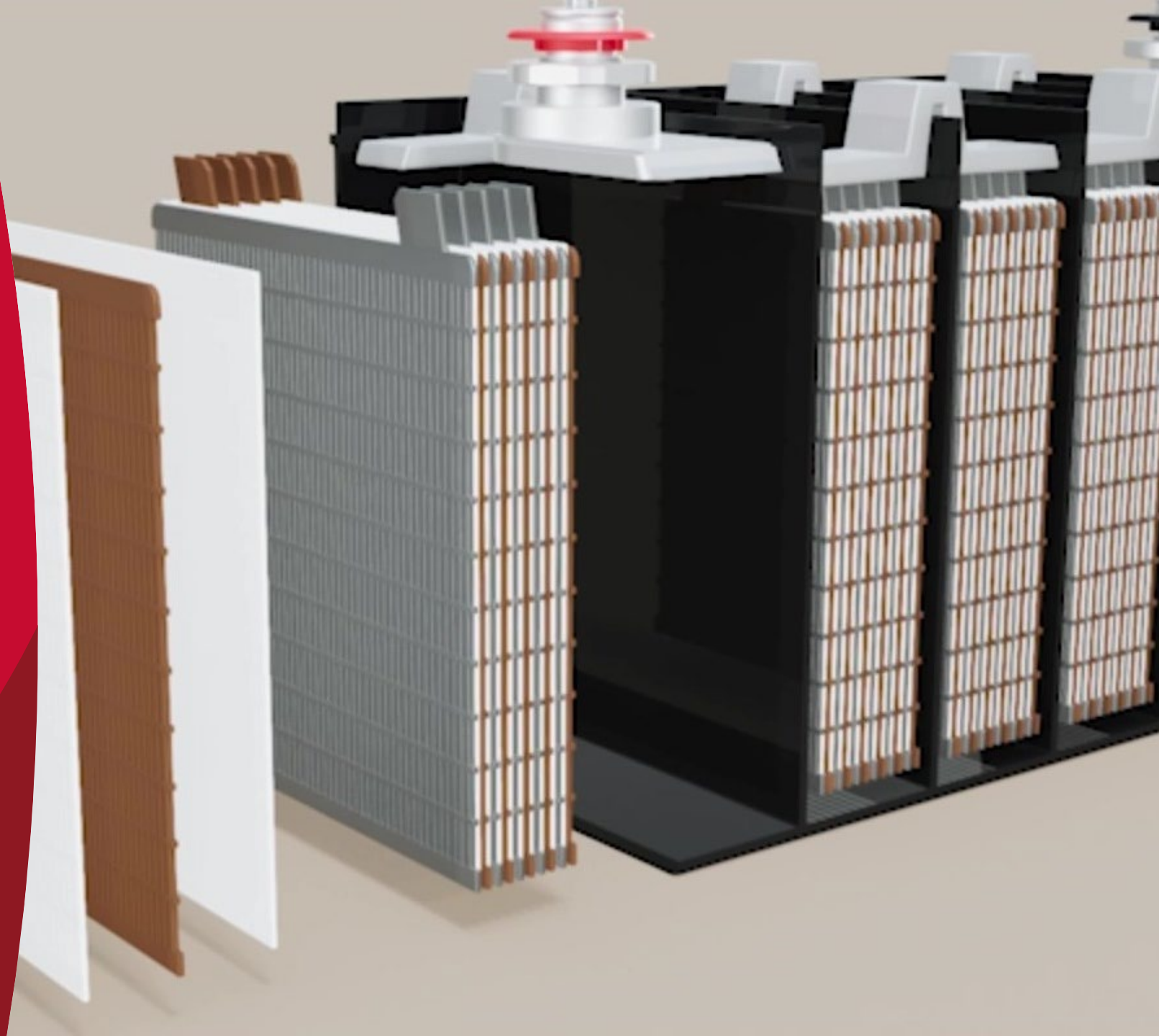
APPLICATIONS

- HIGH MOBILITY TACTICAL VEHICLES
- ALL TERRAIN VEHICLES
- MILITARY TRUCKS
- GENERAL LOGISTICS VEHICLES
- ARMOURED CIVILIAN VEHICLES
- REMOTE WEAPONS STATIONS
- EMERGENCY POWER FOR CRITICAL SYSTEMS (ECM / COMMS)
- GENERATOR SETS

THE TPPL DIFFERENCE !

- SUPERIOR CRANKING PERFORMANCE EVEN AT SUB ZERO TEMPERATURES
- UP TO 50% LONGER LIFE
- SUPERIOR POWER AND ENERGY DENSITY- LONGER RUNNING
- FASTER RECHARGE
- VERY LOW SELF DISCHARGE RATES- LONGER STORAGE

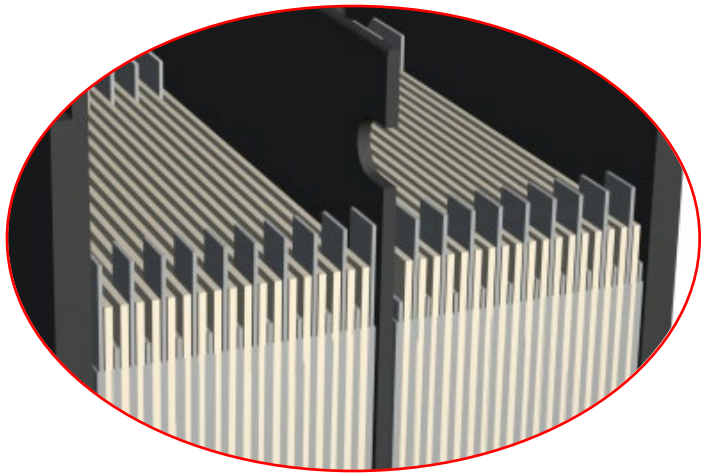
HOW?



THIN PLATE PURE LEAD – PLATES AND SEPERATORS

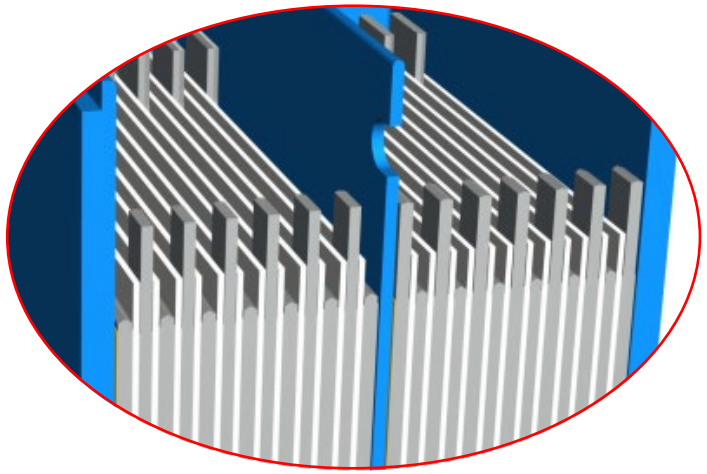
TPPL, Plates & Separators

EnerSys manufacturing process allows processing of pure lead grid.
Result: 1mm THIN



Standard AGM

Conventional battery casting requires artificial hardeners to process grid.
Result: 2-4 mm THICK



TPPL Technology = More plates In Each 2 Volt Cell.
Result = More Cranking Amps & Superior Power & Energy Density.

THIN PLATE PURE LEAD - CRYSTALLOGRAPHY

Standard AGM

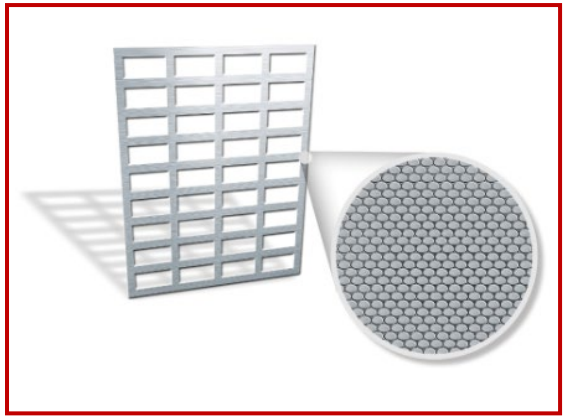
Positive grid alloy is PbCa or Pb-Ca-Sn.
Corrosion at the grain boundaries leads to:

- Grid corrosion
- Grid growth
- Reduction in current carrying capacity
- Loss of contact between grid and active material

TPPL AGM

Pure Lead crystallography and very fine grain structure:

- Grid far more resistant to corrosion
- Pure lead grids with the same design life can be much thinner than lead calcium grids
- Ultra-low internal resistance vs lead calcium AGM or Gel batteries = unlimited recharge current & superior engine cranking performance



THIN PLATE PURE LEAD - MATERIALS

High Purity Materials

Pure Lead Oxide

Pure Lead Grid

High Grade Acid

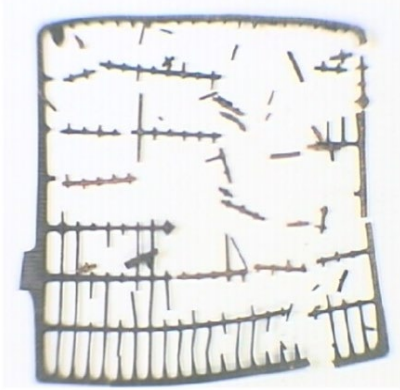
Low Rate Of Self Discharge	= Storage Life 2 x Standard AGM
Low Float Charge Current	= Design Life Up To 50% Longer Than Standard AGM
Low Rate Of Grid Corrosion	
Low Gassing Rate	

THIN PLATE PURE LEAD – LOWEST CORROSION

Positive Grid Corrosion – Typical Evolution

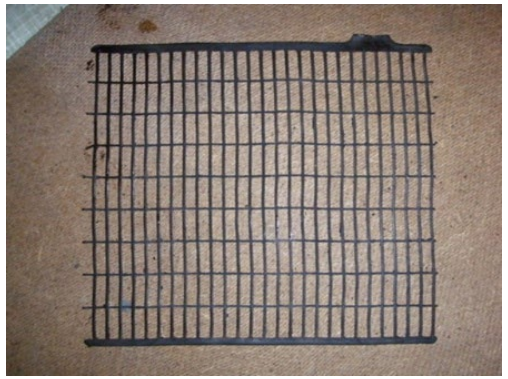
PbCa Cast Grid (Lead Calcium)

400 Days At 55°C
Accelerated Life Test = 12.3 Years



TPPL

>450 Days At 55°C
Accelerated Life Test = 15 Years



EnerSys

Power/Full Solutions

Advanced Systems DEFENCE

Thin Plate Pure Lead

more plates per cell

greater surface area

more capacity

longer running

99.99% pure materials

low internal corrosion

lower internal resistance

key characteristics for the battery

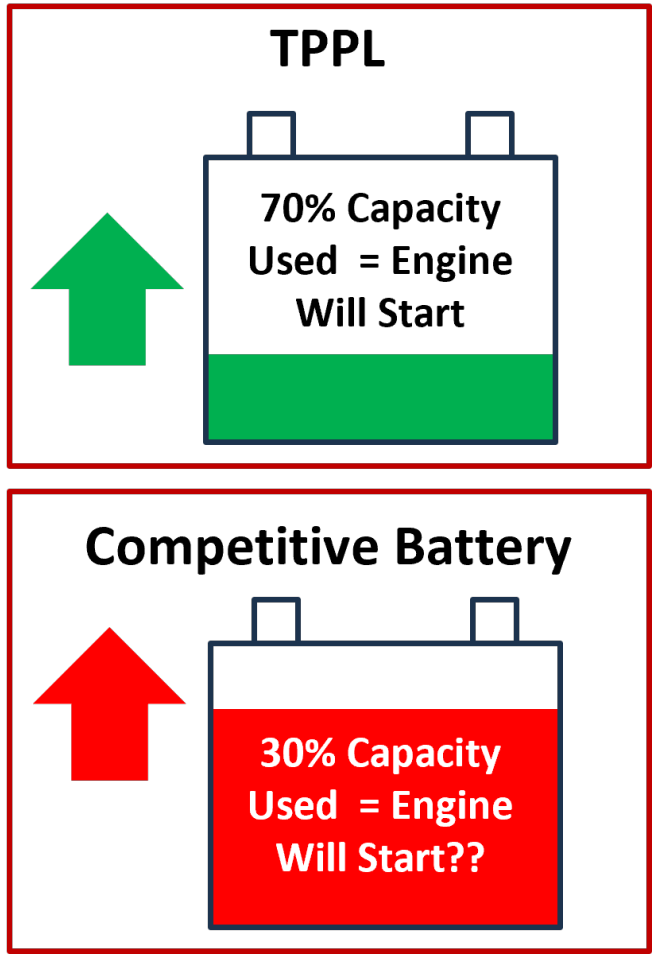
maximize service life

lower total cost of ownership

THIN PLATE PURE LEAD – CRANKING PERFORMANCE

Superior Cranking Performance

- Low internal resistance allows delivery of very high cranking amps even at low states of charge.
- Exceptional performance in sub zero temperatures.
- Capacity normally reserved for cranking can be utilised increasing the overall available capacity on the vehicle.



DATACELL II BATTERY MONITOR

- IMPROVING OPERATIONAL PERFORMANCE AND CREW SAFETY

VEHICLE BATTERY MONITORING & MANAGEMENT SYSTEM

- IMPROVING OPERATIONAL PERFORMANCE AND CREW SAFETY
- OPTIMIZING ENERGY USAGE ON POWER HUNGRY PLATFORMS
- PROLONGING BATTERY HEALTH AND LIFE

BREN-TRONICS LITHIUM BATTERIES

- TRULY MIL-PRF COMPLAINT 6T SOLUTION
- DISMOUNTED SOLDIER POWER
- BATTERIES FOR DIRECTED ENERGY, DRONE AND REMOTE SENSOR APPLICATIONS
- INTELLIGENT CHARGERS

- July EnerSys closed a 208 M$ acquisition of Bren-Tronics
- Bren-Tronics (est. 1973). Approx 280 employees in the U.S., France, U.K. 2023 sales of 100 M$
- R&D, comprehensive testing, certification, first article and UN safety testing, all the way through manufacturing

LITHIUM ION GIGAFACTORY

- FOR ENERSYS PRODUCTS - PROVIDES INDEPENDENCE FROM CELL MANUFACTURERS FROM NON-MILITARY ALLIED NATIONS
- ALLOWS ENERSYS TO OPTIMISE CELL SIZING IN BATTERY SOLUTIONS FOR CUSTOMERS

- Selected Greenville, South Carolina, USA to develop a Lithium-Ion cell gigafactory
- 500,000 square foot state-of the-art manufacturing facility to manufacture various form factors of Lithium-Ion cells with a production capacity of four gigawatt hours (GWh) per year
- Partly funded by 199 M$ award from US DOE
- Dedicated production line for US DOD
- Opportunity to scale to double in size as demand increases

POWERING & PROTECTING THE FUTURE

LAND DEFENCE

OUR CUSTOMERS LEAD TO LITHIUM JOURNEY

- The Power of EnerSys - a solid partner to rely on through your technology transition
- Battery solutions purely driven by user requirements – chemistry and technology agnostic
- Proven, market leading TPPL lead-acid solutions
- Market leading existing Lithium-Ion portfolio and product engineering and manufacturing capabilities to meet the needs or the market as it evolves
- Surety of supply and stable design control. Batteries built from the ground up with EnerSys Lithium cells
- Sustainable supply chain free from potentially non-allied nations

Thank you

Questions?