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NARADA HRXL SERIES DATA CENTER BATTERY:

AN INSIDE LOOK AT WHAT MAKES THIS VRLA BATTERY THE MOST RELIABLE, COST-EFFECTIVE DESIGN AVAILABLE TODAY

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a proven performance record of almost a decade in long-life, high temperature environments

Just like any other market or industry,

the battery market is progressing and evolving along with its offerings of products and services. Manufacturers continue to strive for excellence and advancements in technologies to meet the challenges we face head on. Costs continue to go up on products and parts as companies try to manage these expenditures and bring the best battery product to market without significant impact to CAPEX/OPEX costs.

The industry is constantly challenged to simultaneously improve the product capability, lower the cost, reduce the change out frequency and reduce footprint size - all of which can save the customer both money and time. Sometimes, the best product is discovered not by any one new product, feature or benefit, but through a combination of features and how they are assembled and applied together.

COMBINING BEST FEATURES

The Narada HRL and HTB Series batteries were the initial step in this direction. HRL designs are optimized for one to ten minute high rate discharges, the high-performance characteristics needed for data centers. The HTB reserve power telecom designs have a proven performance record of almost a decade in long-life, high-temperature environments.

Combining the best features of these two products is what has been created within the new critical power HRXL Series batteries. Both products were the impetus for what is now a key product in the data center segment.

REDUCED PRICE

As true in most industries, there will always be a need to drive OPEX/CAPEX costs down. The challenge is not only in finding efficiencies within the processes or less expensive parts to work with, but to find ways to manage these costs without sacrificing the integrity of a reliable quality product that achieves high-performance and reliability standards. Today, there are clear opportunities to reduce the change out frequency while above all keeping OPEX/CAPEX costs down. The HRXL product series has accomplished these goals.

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CRITICAL POWER HRXL SERIES

A COMPLETE SYSTEM SOLUTION

From a technology advancement perspective, there are four key elements that meet these challenges to deliver a longer life, leading to higher performance and reliability. These key crucial parts include the proprietary UX16 alloy, patented three-part catalyst vent, NXP5 expander and advanced AGM separator. Each one of these components assumes an essential role, but how they work together collectively is where we find a complete system solution.

20% increase

in conductivity &

22% decrease

in internal resistance

THE UX16 ALLOY

The grid alloy applied in the HRXL series, the UX16 alloy, is a uniquely formulated advanced long-life, high temperature, lead alloy that utilizes a special combination of elements and provides extremely low corrosion rates and exceptional adhesion properties. The powerful blend of the UX16 alloy also provides many of the corrosion resistant characteristics of a thin plate, pure lead design but has the added benefit of higher surface area and greater paste to grid adhesion properties that are found in many cast alloy grids. With adhesion itself being a key driver in the longevity of product performance, the UX16 makes a significant impact in the overall life and reduction of internal resistance and float current. The results from testing have shown a 20% increase in conductivity and a 22% decrease in internal resistance over comparable pure lead.

MORE THAN A SAFETY VENT

Catalyst vents are critical in addressing the ongoing problem of dry-out and lowering the float current within a battery by improving recombination efficiency and reducing hydrogen and oxygen evolution. This key component reduces gases from leaving the system while still performing the function of a safety vent, with the additional task of maintaining the thermal runaway resistance needed to keep a battery functioning properly. The amalgamation of a catalyst vent with the unique UX16 alloy and other critical elements is what delivers the efficiency and reliability of the HRXL product.

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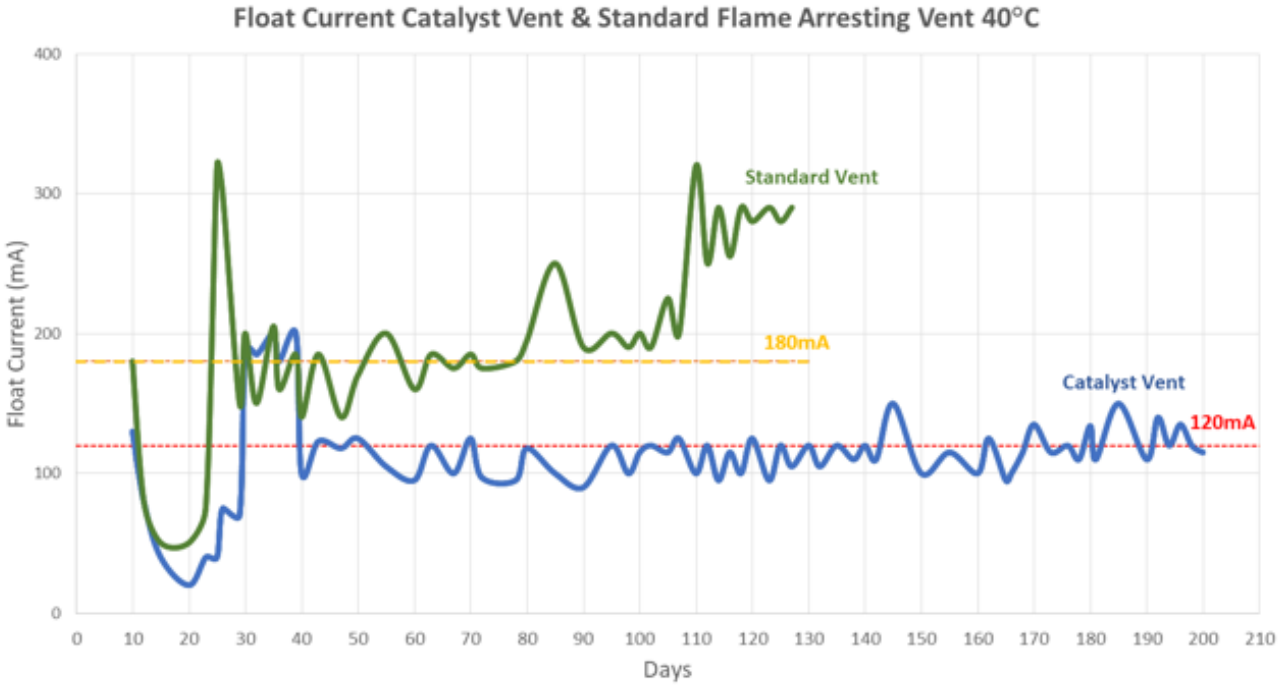
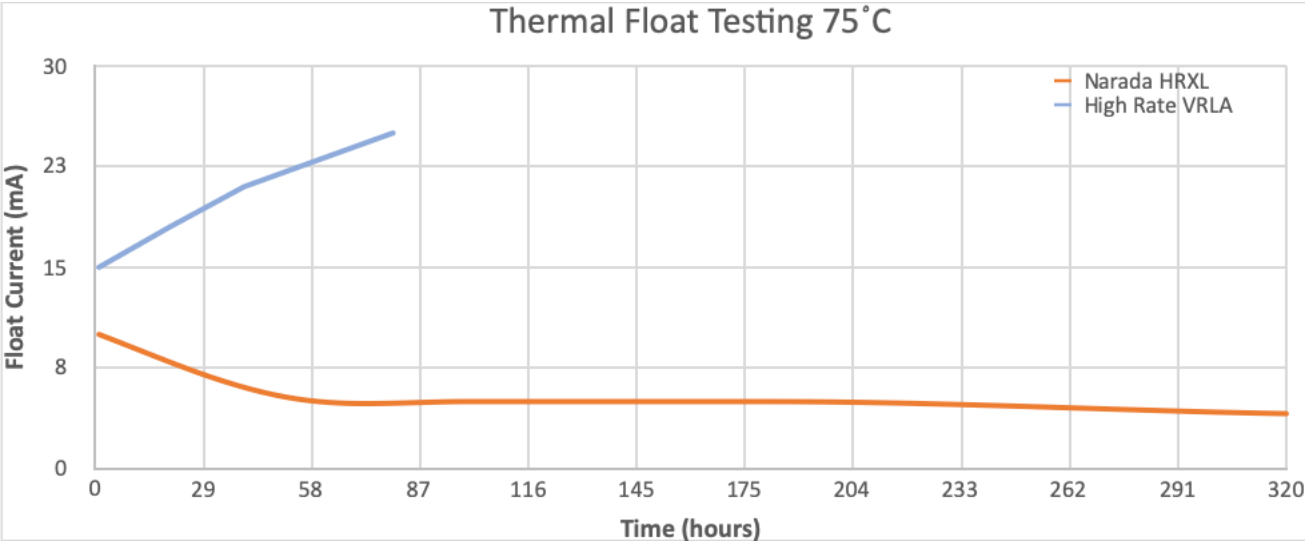
THE FOLLOWING TESTING DATA BELOW ILLUSTRATES THE REDUCTION IN FLOAT CURRENT UTILIZING THE CATALYST VENT AS WELL AS THE RESISTANCE TO CURRENT RISE AT ELEVATED TEMPERATURES



THE THERMAL FLOAT TESTING DATA ILLUSTRATES THERMAL RUNAWAY RESISTANCE UTILIZING THE COMBINED TECHNOLOGIES



CRITICAL POWER HRXL SERIES

a higher performing plate will ultimately result in a higher performing product

IMPROVED SEPARATOR

The advanced reformulated separator utilized in the design is tasked with improving wicking, maintaining cell compression and performance. By improving the electrolyte wicking, this enables the electron travel from plate to plate, which improves the overall performance of the product.

NXP5 NEGATIVE EXPANDER

Additionally, helping improve life and overall performance is the modified negative expander. This newly formulated expander provides greater temperature resistance, higher capacity and charge acceptance. The NXP5 negative expander in the HRXL series is key in balancing out the other structural elements and functional changes of the other key pieces such as the alloy, catalyst vent and separator within the product. A higher performing plate will result in a higher performing product and that is the ultimate goal.

THE MOST RELIABLE SOLUTION

Together, the contribution of each of these four things leads to higher performance and reliability, making the HRXL series of products the most reliable solution in critical power, high-rate discharge applications. Each element is created using pure virgin materials for plastic, acid and lead with no recycled content in the battery. Investments like these, into quality materials and products, will deliver higher quality results. All the elements noted above serve a special purpose in the process with the exclusive UX16 alloy elevating it to a higher level of efficiency.

As seen with industry standards, the IEC 60°C accelerated life testing demonstrates significant improvements over standard VRLA and HRL series batteries.

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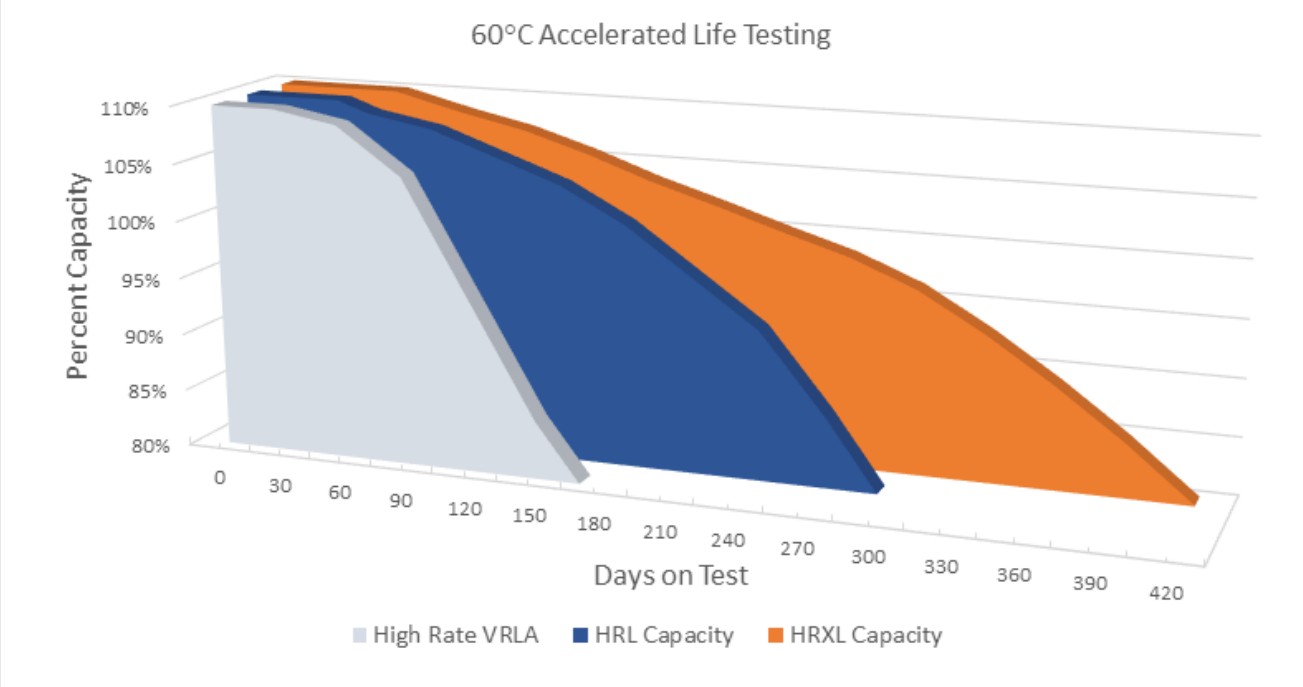
THIS DATA, ON THE CHART BELOW, PROVIDED BY A THIRD-PARTY LAB, SHOWS WHEN COMPARING THE HRXL PRODUCT TO OTHER SIMILAR PRODUCTS, THE DIFFERENCES ARE UNQUESTIONABLE. THE DATA DEMONSTRATES THE SUPERIORITY NARADA HRXL SERIES PRODUCTS HAVE ON IMPROVED LIFE OVER COMPETITIVE HIGH-RATE VRLA AND NARADA HRL-SERIES



UNMATCHED STRENGTH

The unmatched strength of the HRXL product is found in the combination of all these technology advancements along with the unprecedented warranty and cost benefits. Additionally, while the products are designed for nominal temperature environments, they also have the capability of being used for high temperature applications as well, based on the proven performance history in this space. HRXL is a total system solution which provides the confidence in performance and reliability that is essential in the battery market today.

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