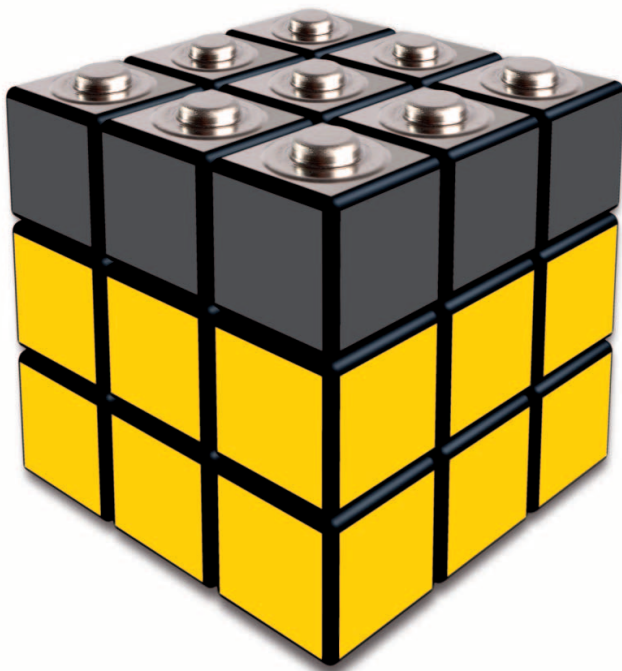
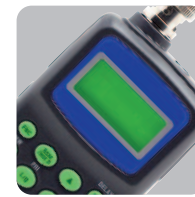
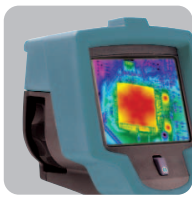


There are many
problems to solve when
designing a battery...



...on the plus side, we
can provide the answers.

VARTA's CellPac PLUS,
the battery design
service you can trust.



Faster to market. Improved Performance. Better Battery. No Compromise.

CellPac PLUS is VARTA Microbattery's new custom battery design service for portable and handheld electronic devices for the industrial, medical and communications markets. CellPac PLUS is not a one-size-fits-all option. It enables exceptional products to keep delivering exceptional results. Combining cell and electronics knowledge, CellPac PLUS delivers optimised product features without compromising on safety, reliability, endurance or fit.



Hand-held applications hold many challenges for battery design. From the decision to embed, to the selection of sufficiently robust mechanical packaging or the design-in of necessary space for electronics interfaces, battery design requires considerable resource and expertise. At every stage of development, however, from cell chemistry to mechanical and electronic integration, CellPac PLUS has built upon years of knowledge and experience to provide a complete professional design service ensuring:

- No more design uncertainty
- Uncompromising quality
- Exceptional reliability
- Your peace-of-mind through comprehensive safety certification.



Saving you time

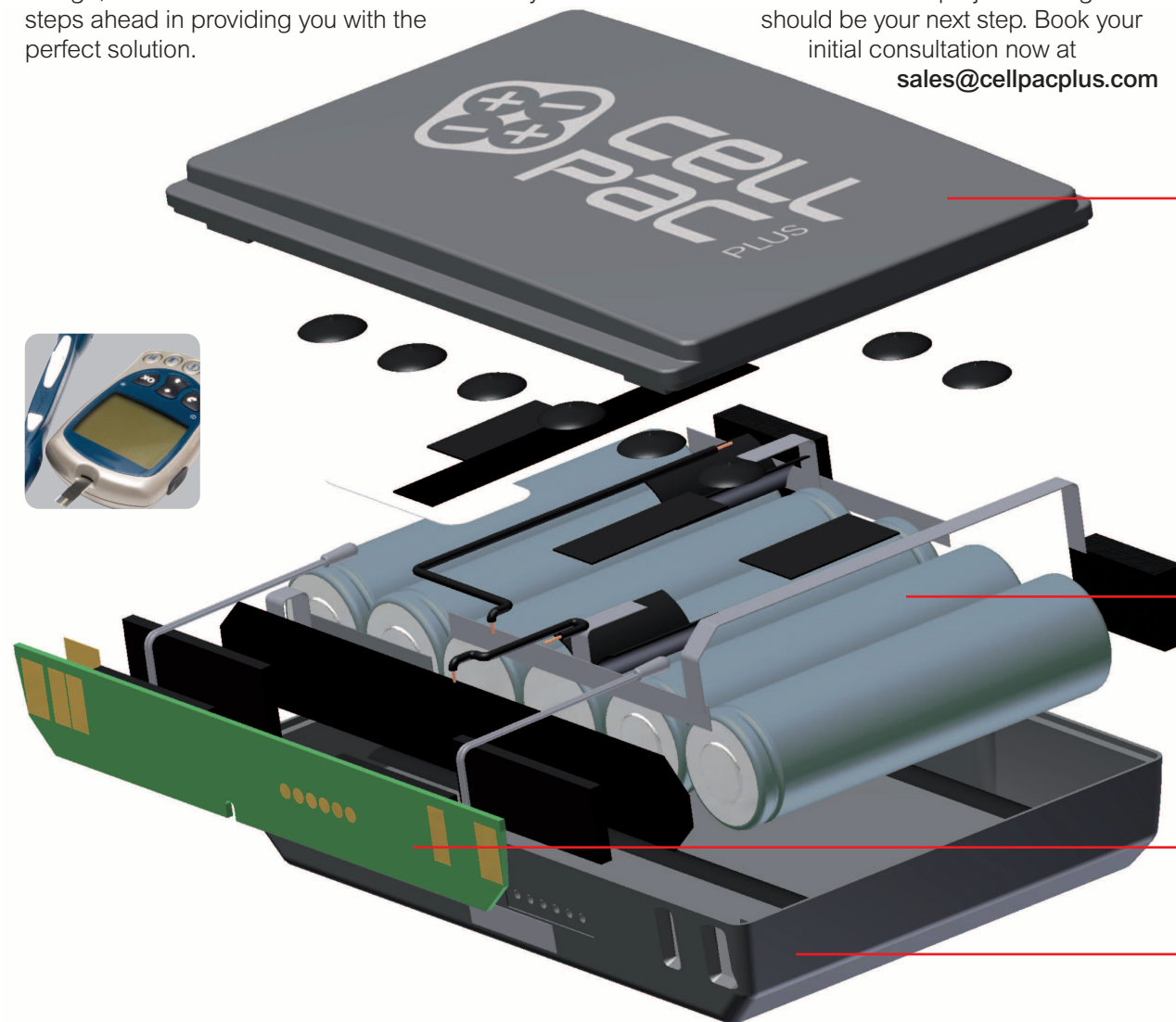
CellPac PLUS delivers a total project management, end-to-end battery design solution from the initial specification to product manufacture. Working with the CellPac PLUS team will give you access to a dedicated

group of technicians and project managers, each experienced with every aspect of battery design, construction, certification and implementation to ease the time-consuming development process. It is VARTA's responsibility to deliver the best battery for your product on-time and on-budget, enabling you to achieve faster time to market and better results.

Helping you to keep delivering exceptional products
CellPac PLUS not only delivers increased battery reliability and cell endurance to enhance your product features, but the project managers also pride themselves on creating a great partnership with their clients. Like any great team, the stronger the relationship, the better the results, so when you are looking for the right battery design for your next product design, VARTA's CellPac PLUS team are already steps ahead in providing you with the perfect solution.

Next steps

If battery choice is important to your design and your company produces between 10,000 and 500,000 handheld, portable and wireless devices every year for the industrial, commercial, medical or automotive industries, speaking to VARTA's CellPac PLUS technicians and project managers should be your next step. Book your initial consultation now at sales@cellpacplus.com



Design considerations of the CellPac PLUS process

The CellPac PLUS design and development process combines VARTA's renowned cell knowledge with experience of designing batteries for a range of industrial, medical, specialist communications and point-of-sale applications. The employment of this experience ensures exceptional performance over the lifecycle of your product .



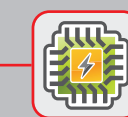
Mechanical design

Protection and connection are key considerations in mechanical design. Capacity calculations need to be reconciled with the mechanical envelope and consideration needs to be taken of how the battery should be connected to the host application.



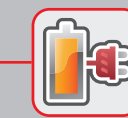
Chemical architecture

Choosing the right cell is just the start of any battery but it remains a vital decision influenced by the amount of capacity required to run the application, the quiescent current requirements, the load current profile, charging regime available and the operating environment in which the battery will be used.



Electrical and electronic design

Understanding how much capacity is required to run the applications the length of the charging cycle, the current pulse requirement and the overall load profile are all important factors in the design of a battery. Reconciling the peak current demand with the protection circuit module and correctly gauging the minimum voltage for discharge of the battery are also vital to avoid shortening battery life.



Embedded vs. removable battery

Whether a battery is embedded or removable by the end user has significant ramifications on its design. Embedded battery design is cheaper but typically means that end-of-life (EOL) for the battery determines EOL for the host system. Removable battery designs need to consider elements of mechanical design such as protective housing and connection robustness especially if the battery will be changed frequently.



Certification and testing

Transport certification is a must for rechargeable Lithium batteries. Without certification you'll have to ship them as dangerous goods, greatly increasing your shipping costs, time, and burdening your resources. Understanding which approvals are required at the start of the design cycle and obtaining those approvals through certified testing procedures are essential. This ensures regulations are adhered to and that the end user can enjoy the product safely.

Read how CellPac PLUS helps customers build successful products with a bespoke battery solution



TouchStar – Portable Terminals

TouchStar provides technology that keeps fuel stations stocked with petrol and diesel. Its Raven and Kestrel TouchPC portable terminals and software enable petrochemical companies to track and control fuel tanker fleets and log deliveries to fuel stations in real time.

The regulations governing the use of electrical equipment near highly combustible materials are extremely strict, and require specialist expertise in the design of safety-critical components such as battery power packs. So TouchStar commissioned VARTA Microbattery's CellPac PLUS service to design the control circuitry for the Raven and Kestrel battery packs, and pilot them through the industry's stringent ATEX certification process.

By using CellPac PLUS, TouchStar got a certified, high-performance battery design while keeping its internal engineering teams focussed on the design of the company's core delivery-tracking software applications.



Read the full version at: www.cellpacplus.com/casestudies/touchstar.pdf



Invacare – Oxygen Conservers

Invacare Corporation, the world's largest manufacturer of home medical equipment, supplies products to a very highly regulated market, in which patient-safety

certification is rigorous and strictly monitored.

By working together with VARTA on certification and compliance of our battery for a new line of home oxygen concentrators using CellPac PLUS, Invacare was able to focus internal resources on the design of its core product. The experts at CellPac PLUS were able to modify the battery design for compliance with various medical regulations and achieve certification well before Invacare was ready to go into mass production.

Read the full version at: www.cellpacplus.com/casestudies/invacare.pdf

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