BATTERY POWER PRODUCTS & TECHNOLOGY
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Battery Pack Considerations When Selecting a Design and Manufacturing Partner

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From the perspective of buyers of consumer and commercial battery packs, selecting an energy system provider can be daunting. Although we are all attracted to the lure of low cost products from Asia, there are a number of considerations that must be understood before an appropriate supplier can be identified. From an engineering perspective, required design skills can range from simple single cell shrink wrap batteries to complex, intelligent computer packs or public safety radios where packaging requirements can be rigorous. One must always balance the desire for low cost with the need for quality and performance when selecting an appropriate partner. Hidden costs must also be considered when using off shore manufacturing as travel costs, conference calls, and schedule delays can have a significant impact on the total cost of a project. Finally, the long term strategy must be considered as the supplier selection might be altered if a more strategic relationship is anticipated.

Design Complexity

Although most OEM's have a clear understanding of their product's power profile, packaging and energy needs, there are many variables that must be considered during the design process that can have an impact on the final product. Variables such as cell chemistry and environmental considerations may seem obvious, but subtleties relating to power management circuitry, safety protection strategies and severe environmental and packaging constraints will require expertise that OEM's often do not have in-house. Depending on the location of the customer, a variety of agency approvals may be required prior to shipping product. Additional complexities such as RoHS regulations and strict guidelines on the transportation of packs with lithium ion cells may also exist. The best advice when dealing with products that require energy system design is to identify suppliers that have expertise in your specific market that have developed products of similar complexity.

Quality Systems and Culture

It is generally obvious when visiting a potential supplier what level of quality "consciousness" they have within their organization given a bit of questioning and hands-on observing. With the knowledge of your specific needs in hand (design requirements, specifications, quantities, price goals, timetable, etc), it is important to assess the capabilities of suppliers for the following capabilities:

Product Development Processes: Are there design reviews, pilot runs, documentation, engineering change notification procedures, sample inspection processes and tooling approval processes in place? An organization with these systems can easily convince a potential new customer that they are a well oiled machine and worthy of new business.

Factory Quality Controls: These can be easily observed during a walk-through tour. Key considerations include the use of operator instructions at work stations, preventive maintenance logs on equipment, statistical process controls at critical operations and tracking metrics to monitor factory performance. Note that in Asia it is common to contract out sub-assemblies to local suppliers so be sure to understand whether your supplier uses subcontractors and how quality is controlled. Factory quality inspections should be documented and include in-process audits and inspections, incoming quality controls and final out-of-box checks.

Return Processes: All suppliers, no matter how quality minded and competent, have issues and returns. The key is to see how these returns are handled, how quickly root causes are identified, and if containment, corrective action plans and final resolution result in the elimination of repeat issues. This is often one of the best ways to judge the capabilities of an organization and is a window into the critical thinking and problem solving skills of the engineering team.

Global Considerations

Everyone is aware of the low cost potential of working with Asia manufacturers resulting from reduced labor costs. There are also added benefits of sourcing components in Asia and most manufacturers have significant advantages over US suppliers in realizing reduced costs on commodity parts. Many pack providers also have their own plastic tooling capabilities

or have local partnerships established for low cost and short cycle tools. This can result in significantly reduced costs but without care quality issues may result.

Recently, I attended two global sourcing shows in Hong Kong. The most striking observation is that there are a great number of new battery pack and rechargeable cell suppliers in China. Most display a wide variety of products, including two way radios and lap top batteries, and all are anxious to win new business. It is very hard to tell what the capabilities of these suppliers are from a quality and engineering perspective but it is clear that one can obtain very low cost quotations on existing products.

Given the right circumstances, and with a long term strategy to work closely with a given supplier, it is possible to achieve the "holy grail" of battery pack sourcing; low cost, high quality, quick turn and responsive design processes with the capability to ship to global customers. But in all cases, be prepared to do your homework in terms of researching a suppliers quality systems and engineering capabilities before being lured into the quest for the least expensive power solution.

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