

Heat, vibration and shock are the biggest enemies of the electronics industry. Even specially fortified electronics can have a meltdown when exposed to any of these extremes. And with your sensitive electronics, it often doesn't take much energy via heat, shock or external vibration to spark failure.

Unfortunately, many industries must deploy electronics to environments that are less than ideal: aerospace, oil and gas exploration, construction and the military, to name just a few.

So, when you deploying electronics in locations with excessive temperatures, shock, or vibration, how can you ensure your components will reliably perform?

Re-Defining State-of-the-Art Protection

Ulti-Pad and *Ulti-Pak* preforms, from Houston-based Ultimate Solutions, are emerging as one of today's most innovative and effective ways to protect electronics. This patented technology is designed to protect mission-critical electronic components from damage due to heat, shock, and vibration. *Ulti-Pad* and *Ulti-Pak* preforms extend the life of electronics, even in the most hostile environments, and keep them performing reliably.

These custom-molded preforms are designed and pre-molded or pre-formed to precisely fit electronic components, assemblies, and chassis like a glove. They are injection-molded or preformed using state-of-the-art, highly-filled silicone, which helps isolate vibration. And, with the improved thermal conductivity, *Ulti-Pad* and *Ulti-Pak* preforms can reduce the thermal rise of components.

Challenges with Potting and Encapsulation

Traditional methods, of protecting electronics by potting and encapsulation, often fall short. These techniques involve placing the component in a potting vessel, pouring a potting compound over it, and then curing the potting compound for a period that can range anywhere from one to 24 hours.

This procedure typically creates a permanently encased (in the potting medium) electronic assembly.

Potting and encapsulation are useful techniques in some applications, but they have shortcomings that make them often unsuitable or too expensive

***Ulti-Pad and Ulti-Pak preforms
Are the Ultimate Solution to these Challenges.***

The Ultimate Solution to Potting and Encapsulation *Short-Comings*

Manufacturing Costs: Encapsulation & Potting are Labor-Intensive, significantly increasing manufacturing time, and therefore expense.

Ulti-Pad and *Ulti-Pak* preforms often take only Seconds to apply during the electronics assembly process, shrinking the time, the cost involved.

Product Integrity: With potting & encapsulation, impurities on the electronics can prevent the potting compound from curing properly. While the resulting device may look fine from the outside, the interior may retain a pasty consistency. This compromised physical structure diminishes the compound's ability to protect the electronics. Performance can suffer.

With *Ulti-Pad* and *Ulti-Pak* preforms, you can physically inspect the protection in just a few seconds, as you re-apply it — so you can be assured of its integrity.

Thermal Expansion: Many materials used in potting and encapsulation expand at high temperatures, such that they damage the electronics they are intended to protect.

In contrast, *Ulti-Pad* and *Ulti-Pak* preforms protect fragile components by: (1) providing minimal clearances to compensate for thermal expansion and (2) using specialized silicone materials, whose thermal expansion more closely matches the electronics they protect.

Access to Protected Electronics: Once an electronic assembly is potted or encapsulated, it is expensive and time-consuming to regain access for calibration or repair. Re-entry also introduces the risk of damaging the components within. The process to reapply this protection is labor-intensive and costly, because it must be started from scratch, as if it were the first time.

Ulti-Pad and *Ulti-Pak* preforms are easily removed and reused (see photos). Once removed, assemblies can be quickly serviced or calibrated,



1. A Single-molded Ulti-Pad Preform

Access to Protected Electronics *(continued)*

or components can be easily replaced. This can be accomplished in a fraction of the time required for potting and encapsulation protection, with less risk to the devices inside.

Once an assembly has been repaired or calibrated, its *Ulti-Pad* or *Ulti-Pak* preform can usually be quickly reapplied and reused.

Flexible Configurations

Ultimate Solutions uses mold-design software to create designs that maximize the performance of each *Ulti-Pad* and *Ulti-Pak* preform. In some cases, reinforcing mesh, metal, wiring, shielding, or stiffeners are added to enhance performance.

Protection for electronics includes both 2-dimensional and 3-dimensional geometries. This enables flexibility, as problems can arise when using 2-dimensional die-cut flat sheets to protect high value electronics.

If an application calls for a non-standard thickness, or if clearance is required to accommodate fragile chips and components, *Ulti-Pad* or *Ulti-Pak* preforms may be the perfect solution.

Three-dimensional configurations are handled by encasing the PCBs in single-molded *Ulti-Pad* preforms (Photo 1) or co-molded *Ulti-Pak* preforms (Photos 2 - 4).

Single-molded *Ulti-Pad* preforms are useful for protecting PCB assemblies in sensors and detectors deployed in high-vibration environments and when you need to regain access to the electronics.

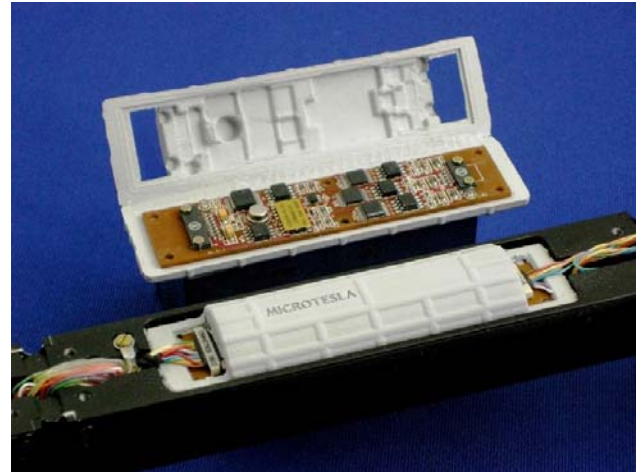


1.

3.

*Single-molded **Ulti-Pad** preforms allow Easy access to electronics after installation.*

Co-molded *Ulti-Pak* preforms are ideal for electronic assemblies operating inside chasses, hatches, and other restricted spaces (Photo 4). Each co-molded preform consists of a hard, thin outer shell, molded to the soft, inner material that surrounds the electronics. The shell promotes rigidity, durability, and easy insertion.



4. A co-molded **Ulti-Pak** preform is **Easy to re-enter and reuse.**

A Multitude of Uses

Preforms can be used with a wide range of applications, including circuit boards, sensors, detectors, battery packs and others.

Because of their ease of use, durability, and adaptability, preforms are suitable for many industries. From military applications to deep-sea wells, to manufacturing and car engines, Preforms can keep electronics working reliably, even in the most inhospitable environments.

Ultimate Solutions preforms provide an immense advantage over potting and encapsulation when you need to reduce manufacturing costs, protect against thermal expansion, ensure product integrity, and gain easy access to your electronics long after protection has been applied.



ultimate solutions

Rev up your electronics.

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