

Knowing When To Redesign A Product



In the past year, I have had the opportunity to consult with a couple of clients regarding product problems they were experiencing. Obviously, they were looking for a quick and easy fix. Unfortunately, their designs had fundamental flaws. In both cases, I advised a significant redesign. In both cases, they ignored my advice. In both cases they are still fighting the problem today. Remember Law #3 from the 10 Laws of Design and Development?

Law #3 – Make significant improvement - If you find that a change is unavoidable, make sure the change is absolutely adequate, don't skimp.
If there is any choice at all, overpower the problem rather than trying to finesse it. In engineering, one positive, absolute fix is worth an immeasurable number of probable fixes. No change or improvement should be considered truly significant unless it makes an improvement (in stress, deflection, bearing pressure, whatever) of at least 25% and 50% should be the goal. Confronted with a failed part, any metallurgist worth his salt can always find something slightly wrong. It is tempting to accept these findings as the answer. But minor changes in material selection, heat treating or metallurgical quality rarely affect physical properties by as much as 25%, so we need to look further. The cost and schedule pressure that every development project is under seems to dictate that we find a solution within the confines of the original design. It is usually difficult if not impossible to make the desired level of improvement without significant change to the original design. Every time (yes, every time!) I have been through this struggle, hind sight has shown that if we had bitten the bullet and made the significant design change called for at the first sign of a problem, the product cost and project schedule would have been better off. Letting a problem drag on while searching for a solution that avoids significant redesign rarely, if ever, pays off.

It is understandable that once a significant effort has been expended to get to where you are, it's difficult to take a step back. Engineers, designers, technicians all become invested in the product they are developing. This is, of course, a good thing. Pride of ownership, pride of accomplishment is what keeps us going. Unfortunately, it also means that when problems develop we often lack objectivity in determining whether to devote considerable resources to "fixing" the problem, thereby salvaging our design, or to undertake a significant redesign to more fundamentally address the problem. Obviously, when problems occur we must fix them as quickly and effectively as possible. Sometimes some tweaking, such as material or process changes can effectively solve the problem. But if you find time dragging on and the problem seems to defy your problem solving efforts then chances are you have a fundamental problem with your design. But how do you know? Obviously there is no hard and fast answer. But if you find you are asking yourself that very question – Should I continue to tweak, or should I redesign? – then chances are pretty good its time to make significant design changes.

If you find yourself in this situation, you may want to consider getting an outside expert opinion. There are two situations where an outside opinion is particularly useful. In the first case, you are the expert. You know that there probably isn't an outside expert that knows more about your problem or product than you do. In this case a consultant can provide an unbiased, objective evaluation of the problem. Looking at everything you have tried, and applying good fundamental principles the consultant can help you determine how significant a redesign should be and what are the chances of success. The second case is when you are not the expert in a given area. In this case an expert consultant can quickly and efficiently help you evaluate

Innovative Thermal Solutions, LLC
3402 Chase Rd
Adrian, MI 49221
www.InnovativeThermal.com

Phone: (517) 424-7107
Fax: (775) 854-4076
E-mail: info@innovativethermal.com

Knowing When To Redesign A Product

your problem using knowledge and experience directly applicable to your situation.

If you do call in an expert to help with your problem, the most important thing you can do is to listen to what he says. If you have a flawed design that needs fundamental changes, his advice is of no value unless you follow it.

Remember - ***Law #3 – Make significant improvement - If you find that a change is unavoidable, make sure the change is absolutely adequate, don't skimp.***

