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IS THERE VALUE IN APPLICATION ENGINEERING?

I began my career in the fastener industry over thirty years ago as an Application Engineer. This was a great place to start, and, perhaps, the most cherished time of all my years in the industry. I suppose that Application Engineering can mean different things to different people, but within the fastener realm this role is pretty universally understood as an interface which works with the customer to provide the best fastening solution. This not only means choosing the correct fastener but also the related joint design, fastener heat treatment, finish, packaging, and any number of other design or process related decisions. A good Application Engineer is a combination engineer/technician, salesman, project manager, and customer service representative. An Application Engineer is often the primary company contact with both new and existing customers. Therefore, in addition to these individuals needing good technical skills, they must be personable and possess the finesse of a salesman who works with customers all day long. To be successful, they must have enough gravitas in the organization to successfully make and fulfill commitments to the customer.

Most manufacturers have one or more Application Engineers on staff, even if they are not purveyors of many proprietary fasteners or fastener features. Sadly, however, too few fastener distributors follow this lead and instead rely on salesmanship and pricing to develop customers, both new and old. Although there is nothing wrong with using salesmanship to develop new and existing accounts (in fact, this is necessary), in my experience many of the customers served by distributors do not have sophisticated, experienced individuals or departments focused on fasteners and

fastener engineering. The result is, perhaps, a greater need than the average fastener manufacturer/customer account to supply application's based knowledge, assistance, and expertise. Several times in my career, I have been requested to accompany a distributor representative on a problem solving visit with their customer. In almost every case I have been shocked to experience antagonism and obstruction from the very person I was sent to help. Although this behavior perplexed me at the time, I have concluded that they perceived the application's solution we might arrive at would in some way supplant the existing parts and, thus, the business they already had in-place. This is extremely unfortunate and short sighted as solving a customer's problem almost always serves to improve the supplier-customer relationship and open up new, and often greater, future opportunities.

Thus, fastener distributors and their customers would likely benefit more than anyone else by possessing and supplying application engineering services. Unfortunately, often both the supplier and the customer all too often take fastener products for granted and choose to forget or overlook that a fastener is not a mere piece of hardware but rather an integral component in holding the customer's products together.

In my opinion every fastener distributor should be developing individuals within their organization that possess knowledge of fastener engineering, fastener technology, and their customer's products. Following are three real world examples of application engineering activities that provide insight into methods that can be utilized in developing and aiding a new or existing customer.

Plant Walkthrough

Early in my consulting career I was contacted by a small distributor looking for some application engineering assistance. They had recently just renewed a contract with their largest VMI client. Although this seven year contract was a real success story for them it came with an agreement to provide steep year over year cost reductions for the entire duration of the contract. Their customer, however, had thrown them a bone and agreed to offset the yearly reductions with credits for any cost savings improvements they could identify and be realized. Not having any Application Engineering talent on staff, they hired me to tour their customer's facility and seek out potential improvement opportunities.

I "discovered" a variety of different potential improvement areas including incorrect pairing of hardware (Grade 8 bolts were being paired with Grade 2 nuts), fasteners that were clearly longer than they needed to be (often up to 200% longer than necessary), and use of high strength parts (grade 8) in applications that carried little or no load. Perhaps the most fascinating issue I discovered, however, is illustrated in Figure 1. This is a joint that was used to attach a fan motor on one side of a sheet metal "wall" and a shroud to cover the fan blades on the other side. I noticed some variant of this joint being used in at least a dozen places in the plant. What really caught my attention were the materials utilized in the different components. These joint stack-ups included some mix of zinc electroplated, powder coat painted, and stainless steel parts nestled against a galvanized steel sheet. My immediate observation and question was, if several of the components can acceptably utilize zinc electroplated parts, why the stainless steel components? Additionally, although these were brand new units being prepared for service, I suspect that if I had the chance to review units that had been in service a while, the dissimilar metal contact would have produced unfavorable galvanic couplings and the zinc plated parts and galvanized steel sheet would be experiencing galvanic corrosion. As this exercise was primarily intended to be one of finding unnecessary cost drivers, if the answer to the immediate question of sufficiency of zinc electroplating was in the affirmative, then using any stainless steel parts, which were likely three to four times the cost of equivalent zinc electroplated versions, was a significant finding.

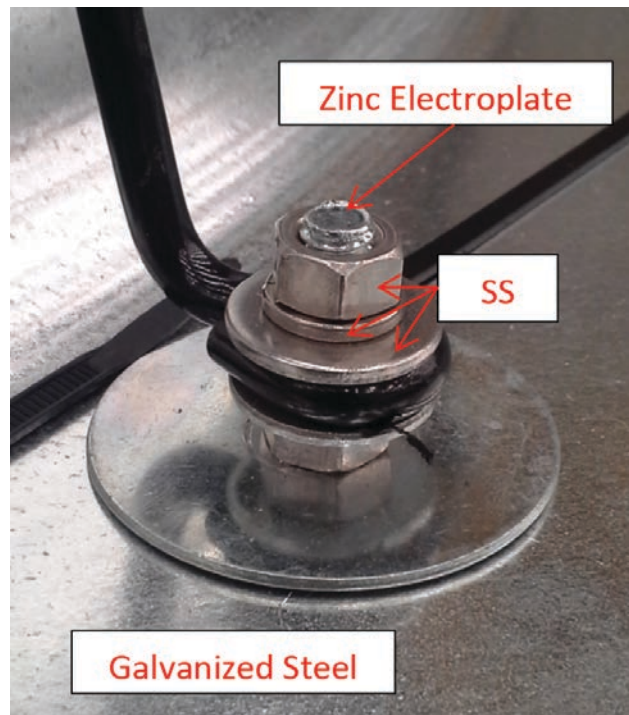


FIGURE 1

Of course every observation that identified a potential cost savings would need further exploration to determine feasibility relative to the design intent of the joint. It is unlikely that every observation, therefore, would produce an actual cost savings. However, if only one half of the items I observed were truly feasible, the impact of changes would still be significant. In fact, I really wouldn't be shocked if I identified somewhere between \$500,000 and \$1,000,000 of potential cost savings, many with tangible quality improvements associated with them. This particular case may represent an extraordinary example, but this just serves to illustrate what can be identified by simply walking your customer's plant floor and looking for items of concern and improvement. This activity may be the single most productive applications activity you can engage in.

Solving An Unexpected Problem

Very often, Application Engineers are problem solvers. Figure 2 illustrates a fine example of this. This part is a Brake Caliper Bolt, one of two pins (or bolts) that the brake caliper slides along. This particular part was designed about twenty years ago for a very high profile, next generation vehicle. The OEM had a great deal riding on an on-time, problem-free vehicle launch.



FIGURE 2

This chapter of the part's story begins with a test used by the OEM to validate the brake system. This particular test simulates the vehicle driving down a steep mountain incline with regular application of the brake. The test was pretty extreme and, unfortunately, took its toll on the original brake design with these bolts breaking prior to the minimum specified number of braking applications. The problem was determined not to be one of these bolts but of another of the brake's components which caused the caliper to flex more than it should. This flexing action resulted in a premature reverse bending fatigue failure of these bolts.

Neither time nor the financial impact of fixing the other component was on the side of the caliper manufacturer or the OEM user. As such they approached my team, imploring us to find a way to strengthen the caliper pins enough to meet the requirements of this particular test. Now this was no easy task but just the sort of challenge that really excites an Application Engineer. In the end, my team made several changes to the part design and the manufacturing process which successfully solved the problem. It was a big win all around, as it not only solved the customer's problem at a fraction of the cost of other solutions while cementing our reputation as problem solvers with our customer and the OEM. This reputational standing locked us in as the sole supplier of the part through its life, with no fear that some other entity might swoop in and pull the part away by offering a lower price. I have many other similar examples of problems solved and how the outcome elevated our reputation with our customers and cemented parts as permanent fixtures. Therefore, problems should be viewed as opportunities to demonstrate application engineering talent that can lead

to establishing or improving your reputation as a solution provider. Once you gain such a reputation it will naturally lead to many new, often exciting business opportunities.

Product Teardown

Product teardowns are excellent and proactive ways that you can display that you are more than just a parts supplier to your customer. Imagine your customer's surprise and delight when you hand them a report showing how each fastener is used in their product with recommendations and observations of potential improvements to quality, assembly, or cost.

Over the last thirty years that I have been in the industry I can count on one hand the number of times that a customer has approached me to do a teardown study for them. I find this interesting because if the activity is done thoroughly and innovatively, the results are far more valuable than the sacrifice of one unit of the product. Unfortunately, even fewer fastener suppliers proactively take on this activity. I understand that tearing down a car might not be justifiable, but there are many other smaller products that cost less than \$500 which could be good teardown possibilities. In fact, Figure 3 illustrates a teardown study that I conducted on a chain saw several years ago. The saw cost a couple of hundred dollars but the information gleaned from the study was invaluable.

In addition to a great marketing tool with customers, teardowns can be an excellent source of commercial information. For example, let's say that you have a part or two that you are very proud to be the supplier of, and, you know that it goes into a particular product. Now imagine doing a tear down on several competing products and finding that they use a nearly identical part.



FIGURE 3 - EXCERPT FROM CHAIN SAW TEARDOWN

You now have some intelligence about a potential new customer opportunity as well as a great story to pique their interest when you make an appointment to visit them. Imagine how much more interesting your story might be to a new, potential customer when you can explain that you have studied their product and already support other customers with similar products. Teardowns, therefore, can be an effective method to further develop new parts or solidify one's reputation with existing customers. They also can be an excellent tool to utilize the experience you have with one customer or type of part with a new, similar customer. I have a colleague that has appropriately named this a "cut and paste" strategy. Teardowns, especially those proactively driven by you require time and some financial investment, but when conducted by experienced application engineers will usually provide a nice return on investment.

Considering the three examples above, engaging in Applications Engineering activity can provide your organization the following:

- Build your reputation as a solution provider and not just a "me too" fastener supplier. Consider for a moment your personal consumer preferences. Most likely there are a couple of stores or service providers that immediately come to mind. Regardless of cost, you always take your business to these individuals or entities because they have a proven track record with you as effective problem solvers.

- Provide proactive and creative ways of identifying new business opportunities. Both the Plant Walkthrough

and Product Teardowns are creative ways to expose customer problems and challenges that they likely are not even aware of. By proactively providing your expertise, you open up new business opportunities and continue to cement your reputation as the distributor to go to for problem solutions.

- Developing application engineers amongst your staff raises the knowledge level of your organization. This can come in handy not only for new business opportunities but supporting existing customers with quality and continuous improvement activities.

- Applications Engineers can be key individuals on teams associated with continuous improvement and quality spills. Their knowledge of the customer's needs, products, and methods often allow faster resolution to such team activities.

Every Distributor should have Application Engineering talent. Although "Engineer" is in the title, and it usually involves some highly technical knowledge, this is one of those roles that does not necessarily require an engineering degree. There are many individuals that have gained a great deal of knowledge and experience working with customers and absorbing everything they can along the way that can serve as "Application Engineers" or "Application Specialists". Therefore, it is important not to read this article and miss the main point, that having individuals on your team who combine product and customer knowledge to provide "Application Engineering" services is an invaluable commodity to your success and reputation. 