

## The Importance of Plastic Product Design - Glenn L. Beall

I have always considered myself fortunate in that my first job out of college in 1957 was as a design engineer in the plastics industry. Those were exciting growth years for the industry. You only had to be there to be swept along by the growth of the industry. Plastics are now this country's third largest manufacturing sector. Today, the amount of plastic materials being produced continues to grow approximately twice as fast as the Gross Domestic Product. But the amount of overall manufacturing being done in the U.S. is declining. However, America is still a major manufacturing country, and the plastics industry is an important part of the manufacturing industry.

It has always been manufacturing that made a super power of first Great Britain, followed by Germany, and then the United States, and in the future China. It was the United States' large manufacturing capability that turned the tide during the Second World War and the Cold War that followed. What Communist China will do with its super power status in the future remains to be seen.

All indications are that U.S. manufacturing jobs will continue to be out-sourced to low-labor-rate countries. Conventional wisdom is that manufacturing will be replaced by an information driven service economy. The final outcome of this change from a manufacturing to a service-based economy remains to be seen.

A strong manufacturing section is important to all industrialized nations. It has always been well-paying manufacturing jobs that generated the tax revenue that supports all of the government services that modern man has come to expect. Well-paying manufacturing jobs also generate the salaries that allow people to purchase all of the consumer products that are now flooding the market. Every manufacturing job also supports 3 to 5 additional jobs in the food and service sectors of the economy.

A strong manufacturing industry is important to maintaining the current high standard of living enjoyed by Americans.

Returning to the topic of plastic product design, I do not believe that design engineers are responsible for, or can they eliminate the problems besetting the manufacturing industry. I do however, feel strongly that good product design can allow domestic manufacturers to do a better job of competing in a global economy.

Many of the things that we take for granted are not found in nature, but are manufactured. The chair you are sitting in, your cell phone, your computer, and your ballpoint pen are all manufactured products that started out as a mental image in the mind of a product designer.

The relationship that exists between a product designer and efficient manufacturing is very important, as the industry can only produce what the designer draws. Manufacturers therefore, have to be concerned with how well the designers do their jobs.

Think for a moment about how the new product design process works. To begin with, creative product designers are dreamers. They are those strange people who can see things that do not exist. And then they make sketches of these mental images so that other people can see what they saw in their mind's eye.

Meetings are held to discuss those sketches. There is arguing in those meetings, and decisions are made. This is followed by a frantic stampede to get this new idea into production as soon as possible. Processing machines are purchased, plastic material is ordered, and molds get built. Out of that new mold comes a plastic part that sees the light of day for the first time. For the product designer this is birth and creativity. He probably does not own that part, but if he designed it, he considers it "his part"

But the story does not end there. If the designer did a good job, that new part by itself, or in combination with other parts, makes a product that takes on a life of its own and important things begin to happen. But, why do they happen?

They happen because the manufacturer had to buy some plastic material in order to mold that part. He had to pay someone to run the molding machine. He also purchases a box to put it in. He then hires a trucker to deliver the part to Walmart. If you can find a clerk at Walmart, you could buy one of those parts. And if you do, somebody else at Walmart would ring up that sale. Once a day an accountant will total up those sales, and then everybody up and down the chain of supply will get paid. And then taxes will be collected, and the government takes those taxes and hires a special investigator. To follow President Clinton and Monica Lewinsky around the back alleys of Washington, D.C., while the television industry sells millions of dollars worth of advertising to inform the world that the soiled, little blue dress was actually made in a sweatshop in Asia.

If there is any money left over, the government builds a road. It will not be where a road is needed, but nonetheless they will build a road. We can then drive down that road to get to work faster to make more money, and with that money, we buy a bigger car, a sports utility vehicle, or even a Tesla, so that we can drive down the road in style to take our kids to college, or go on vacation, buy plastic luggage, stay in upscale hotels, and eat in expensive restaurants. And the great wheel of commerce begins to turn. And why does it turn? It turns because some engineer designed a plastic part that was not just good enough, but was a great part that satisfied a marketplace need or an opportunity, and had what it took to seduce a shopper into spending money to possess that product.

If the plastics industry wants to continue to be a part of that stream of commerce, it is important for all designers to know about the advantages of plastic materials and plastic manufacturing procedures when they start thinking about designing a new product. It is important to recognize that it is the product design engineer who normally selects the material and the manufacturing process that will be used to produce a new product. Their decision can make, or break a market segment.

I have spent my entire career designing and developing plastic products. I have by the "trial and error" method learned a lot about plastic product design. The growth of this industry provided

me with an endless stream of intellectually stimulating new projects. The work was enjoyable and, best of all, I got paid for having fun.

It is a regrettable fact that the manufacturing of plastic products is migrating to other low-labor rate countries. However, there is a high probability that the design and development of new plastic products will remain in the industrialized countries close to the corporate headquarters of the original equipment manufacturers.

Design is important to the survival of our manufacturing industry. It is a simple fact of life that manufacturing can only produce what engineers design. If the designer does a proper job, manufacturing will be efficient and customer acceptance will be good. If the design is lacking, cost, quality, and delivery will be affected, and sales will suffer accordingly.

There are many students in college today who will soon be looking for jobs. The plastics industry will hire these young people without being aware that very few of them have had an instruction in plastic technology, or the design of plastic products or parts. Regrettably, most of them will be left to learn plastics technology by the inefficient trial and error process. Most college students are smart, and they are accustomed to learning from professors or mentors, and books. They will be quick to learn, but only if their employers provide them with mentors and learning opportunities.

If this “By Design” series of articles generates some interest, future articles will address ways of improving the design of the plastic parts and products produced in America.

A handwritten signature in black ink, appearing to be the initials 'JD' or similar, written in a cursive style.