Windsor Industrial Development Laboratory, inc.

WIDL Écho

Your partner in design through simulation

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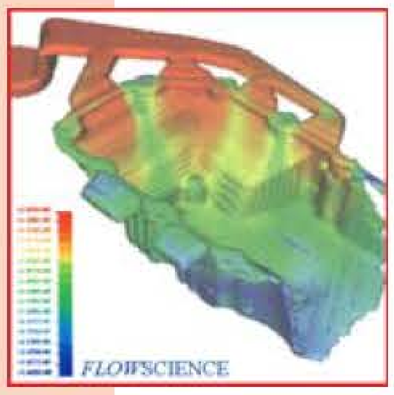
About Us

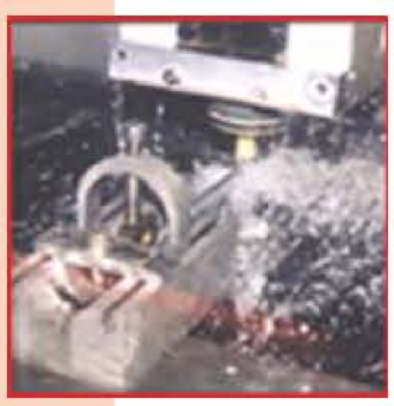
If you need quality support in a timely fashion and at a competitive price, to assess a product or a process, we are only a phone call or a mouse click away. We do certainly have the design and processing experience that you need, and strive to meet the same high standards as you. Taking materials to the next level, via testing and simulation, is what WIDL is all about!

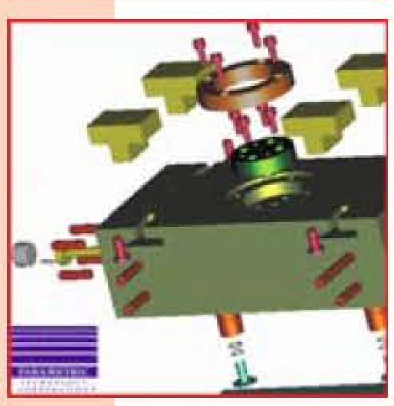
In fact, we have been very successful in materials characterization and virtual prototyping. We apply mathematics to field problems, but still, we do understand the limitations of each type of analysis. Our motto is building effective calculation tools that quickly yield accurate results. We pride ourselves in allowing clients to concentrate on what they do best in today's rapidly changing markets.

Indeed, WIDL offers advanced testing and analyses services to design products and ways to make them. We can also assist build final prototypes and test these under accelerated working conditions. WIDL has over the years run complex calculations, involving non-linear effects. These, unmistakably led to the identification of critical regions at early design stages of clients' processes.

Still, correlation of simulation with test results at WIDL ensures that analyses provided quality predictions. Overall, WIDL offers top-notch expertise, as needed, so contact us to see how we could help you today!







Outsourcing is Here to Stay

No company – or person- can do everything. That's why industry has invented the concept of outsourcing. A given company may be expert at designing one core element of its product – say the speakers in a stereo system, or the packaging of the electronics in a printer. But on other elements of the product, such as the thermal-management design for the enclosures, that company may find it is better to have others perform the work.

Outsourcing can streamline the product-design process by enabling manufacturers to concentrate on their core competencies, and to get much better designs of complementary components from experts in other fields. Besides, the outsourced work may actually be less expensive. In fact, in an era of shrinking deadlines, one can **save time by outsourcing**.

Still, beyond the efficiencies that can come from outsourcing, there is the matter of job creation. Certainly, jobs are often lost when firms outsource work to other outfits. Interestingly though, some of those displaced workers start their own companies, serving their former employers and beyond, build components and subsystems. Moreover, there is the consulting side of the business: Many firms have started offering design services to help others manage their outsourced work.

Managing outsourced work is indeed, critical. While a company can outsource certain aspects of their work, it can never outsource ultimate responsibility as long as its name is on the product. Engineering software firms have been especially helpful here by developing product-data-management and product-lifecycle-management systems, besides other collaboration tools. These are helping engineers communicate with, and coordinate and control the work of other engineers working on the same project – whether they are across town, across the country, or across the ocean.

Now what gets outsourced depends on a company's areas of expertise, and how many "hands it has on deck". There are numerous ways to "divvy-up" the work. Companies can outsource any part of an industrial, mechanical, or manufacturing job. Also, there are a "slew" of reasons to outsource, but the limitation in internal resources is one of the biggest. <u>If a company is not "pumping" out new goods regularly, for example, it does not make sense for it to maintain a full-time design staff</u>.

Another benefit to outsourcing design, that is not so obvious? An outsider, who is not mired in a company's politics and culture, can shed new light on a product's design. Besides, outsourcing extends to manufacturing as well, but the benefits are different. Companies look to contract manufacturers to bear the financial risk, since producing internally requires a huge investment in product and test equipment, and raw materials. Moreover, time-to-market appeals for start-up companies. By outsourcing production, these can get a product "rolling off the door", faster.

So whether it is to cut costs, speed time-to-market, or get a "new angle" on a product design, many companies are using outsourcing as a strategy to handle much of the work that was normally done in-house. Still, engineers need to be aware of all the tools available, to make outsourcing works best for them.

WIDL *Écho is a bi-monthly e-publication*

Do you know?

that DOEs is the application of geometric principles to statistical sampling, in minimizing the number of experiments to solve a problem, or variance in estimated coefficients. The former affects quantity of effort; hence, ***cost***. The latter affects ***quality*** of result. Cost and quality are both central to design for value.

Design for cost – There is a difference between "design for cost", and "design to cost":

"Design for cost is a conscious use of engineering process technology to reduce life cycle cost. Design to cost is the iterative redesign of a project till a given budget is met. Design for cost seeks to reduce cost while meeting customer demands. Design to cost reduces the degree by which customer demands are satisfied until an often arbitrary cost "bogey" is met. Design for cost is an engineering driven process. Design to cost is a management driven process. Design for cost seeks to design the product once, and only once. Design to cost is iterative by nature, and hence, incurs redesign and rework cost. Design for cost seeks to minimize the life cycle cost to the customer by designing high quality into the product. Design to cost attempts in vain to attain product acceptance by inspecting quality in the product. Design for cost requires designing both product and delivery process for simplicity. ***Complexity increases cost***. Design for cost is, thus, an integral component of the engineering process. Design to cost is focused on cost and after-the-fact-management. Low cost cannot be managed into a product; it must be engineered into it."

Source: http://mijuno.larc.nasa.gov/dfc/dfcst.html

Design for quality – Quality is the most effective factor a company can manipulate to attract customers. To be competitive, one must heed customer's satisfaction. To be highly competitive, one needs to delight the customer. The key to do so is design for quality.

The driving force to design for quality is found in *Kaizen* theory, as implemented by *Total Quality Control*. The seven traditional tools[1] enhance the application of statistical quality control.

Design for quality derives from *Integrated Product and Process Development* (IPPD). It focuses on developing customer's product, and improving the system by which to bring forth, sustain, and retire such a product. Two additional important values in design are:

- *Design for timeliness* (to market at the correct time), and
- *Design for (faster) cycle time*, which affects design for cost and for timeliness.

In conclusion: cost is a measure of engineering and business process, and is fundamental to the *genopersistation* of either product or service. The challenge is to choose technical and business sub-processes to cost-effectively go beyond "what is desired", to include customers delight with new and exciting features.

[1] Seven old rules: Histograms, Cause & Effect Diagram, Check Sheets, Pareto Diagrams, Graphs, Control Charts, and Scatter Diagrams

Product Development Process

When design engineers begin a product development process, significant time is often spent weighing materials options. Is plastics strong enough, or shall we stick with metal? If so, which is a better fit – PVC, nylon, or PET? What are both performance and cost considerations? Decision makers also need to add another line of questioning to the material selection process: Who are the suppliers of the various alternatives, and what kind of technical support do they offer?

Microscopic Analyses in Understanding the Cracking of Mechanical Component at WIDL

Technical support should not be confused with the relatively narrow perception of technical service. By definition, technical support encompasses everything from preliminary design consultation, to assistance with pre-production prototyping or production startup. Typically, it includes, providing guidance to come-up with the proper material grades, for plastics, for example, offering assistance in the selection of the appropriate fabrication equipment, equipment setup, and optimal operating conditions. It may also involve recommendations for die design, tooling, along with advice in areas such as coloring and selection of protective additives.

Technical service differs from technical support in that service is dispatched to solve specific problems (as they often occur) with established production processes, while technical support is an ongoing – start-to-finish- benefit.

In virtually all new projects, problems arise, and these require technical support. Things like knitlines, unbalanced molds or extrusion dies, inadequate flow rates, meeting part dimensional specifications and tolerances, scrap-rate targets, etc., can impede the commercial launch of a new product.

Still, consequently to rushing the launch of new goods, by shortcutting the necessary up-front materials selection and engineering (or the simulation phase), project engineers become frustrated as timelines cannot be maintained, and product deadlines get missed. The collective result is production delays, and a subsequent rise in development costs. Now are these problems avoidable or are they simply an accepted occurrence in the new product development process?

WIDL *Écho welcomes your opinions, critics, article proposals and any suggestion for further readings*

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