LIGHTNING in a BOTTLE

Sometimes things happen that you never see coming. Even well-run businesses in idyllic settings encounter unthinkable disasters. Ironically, it's usually the unseen "bolt from the blue" that spoils your perfect day.

For Lewis Design and Planning (LDP), a successful design and engineering studio in the picturesque Village of Ridgewood, New Jersey, the fateful bolt struck one ordinary Friday afternoon in July 2006. And owner Dan Lewis never saw it coming.

Photo by Scott Rathburn

Before the Storm

A man of many talents, Dan Lewis wears the varied hats of industrial designer, graphic designer and certified architect, among others. In a similar fashion, his design studio is staffed by skilled designers, engineers, model makers and machinists – most of whom also claim two or three specialty titles. His wife and partner, Sandy, for example, manages the business end of the studio, and is an accomplished interior designer. Model-Shop Manager David Soong is not only a skilled machinist, but also a mechanical engineer and an award-winning sculptor.

So what does this widely talented bunch do?

In simple terms, they spend most of their time creating plastic models of perfume bottles, lipstick cases and cosmetic jars. In the more precise parlance of the industry, they design and produce "primary and secondary cosmetic and fragrance packaging prototypes." These are exact, working replicas of products that won't be in final production for many months. Don't be misled by the simplistic description; there's nothing simple about these stunning brass-trimmed acrylic models, or the proprietary techniques LDP uses to create them.

The array of seamless, clear bottles the company makes – seemingly filled with colorful liquids – is particularly astonishing. They're virtually indistinguishable from the liquid-filled glass containers of the final product. The only flaw, if you'd call it that, is that they're *too* perfect. Molded glass bottles deform slightly under the pull of gravity, while those machined from acrylic hold a precise shape. The acrylic models may rattle like glass during a thunderstorm, but the "liquid" inside doesn't slosh – it's machined from acrylic, too.

Story by Richard Berry

The Unthinkable

LDP's perfect Friday dawned with chamber-of-commerce blue skies, but by late afternoon, a storm front was passing through the lower Hudson Valley, dropping cold rain on the edge of town. Lewis and his associates paid little attention; they were comfortable, dry and unaffected. The machine shop in back had already shut down for the day, and everyone who hadn't left was in the front offices, winding down the week's paperwork. Lewis was at his design table, lost in thought.

Without warning, a blinding flash and thundering roar shattered the tranquility, rattling nerves, windows and the scores of colorful bottles lining the edge of Lewis' crowded table. Momentarily stunned, Lewis hastily looked out his front window, worried that a nearby tree may have been hit by lightning. He was relieved to see no apparent damage. The designer wrote off the bit of heart-pounding excitement as a welcome interruption to the quiet afternoon, and returned to his work.

Ninety-five percent of Lewis' work is for the country's largest fragrance and cosmetics companies. Clients include industry leaders Estee Lauder, Kenneth Cole, Elizabeth Arden, Coty, Avon and Victoria's Secret. Depending on clients' needs, LDP takes their product from initial design concepts, through prototype model making, all the way to engineering, production planning and manufacturing documentation.

This ability to go from the first flash of inspiration to the very end of the product cycle makes LDP unique in its industry. Since cosmetics companies change their container and packaging designs every few months to maintain a strong marketing presence, the studio's work is never really finished. After another productive hour that Friday afternoon, however, Lewis decided he was finished for the day.

Walking back to the machine shop, it occurred to Lewis that few things are more unthinkable than being singled out by nature to be struck by lightning. He was glad it hadn't happened to him. Reaching the shop door, he tugged on the knob, and before he could react, a billowing cloud of pitch-black smoke surged through the open doorway and raced along the ceiling toward the offices!

A Pall of Darkness

"When the fire department arrived, they couldn't see a thing," Lewis recalls. "The machine shop was completely filled with thick, black smoke. Using infrared-sensor guns, the firemen detected a major hot spot back in a far corner. They knew it was going up and over the ceiling, but they still couldn't see the fire," he continues. "So, they did what they had to do: They broke out the glass and hosed down virtually everything."

Neither the LDP staff nor the fire department would ever discover exactly where the lightning had struck. But the surge of electricity damaged cars in the parking lot, and started a fire in the shop's industrial vacuum system. The vacuum's external debris collector was filled with plastic dust and shavings, and the smoldering plastic produced heavy, black smoke that flowed through the ducting and into the shop.

"It was deceptively destructive," notes Lewis. "We were shocked to discover just how acidic that smoke was. It seemed to eat away or pit everything that was aluminum, and the water damaged everything that wasn't. Between the two, they ruined it all," he says, smiling weakly. "If it was an alloy, it was corroded; if it was ferrous, it was rusted; if it was electrical, it was screwed up."

The well-contained flames caused no real structural damage. Had anyone been in the shop at the time, they could have quenched the fire with a small extinguisher. Nearly all the damage to the machine shop and its contents was caused by the acrid smoke, and the water from the firefighters. But the destruction was overwhelming. "Damage to the machines was just beyond belief," stresses Lewis. "We were grateful that the fireman did what they had to do," he adds, solemnly. "And, we were lucky the damage was contained to the machine shop."

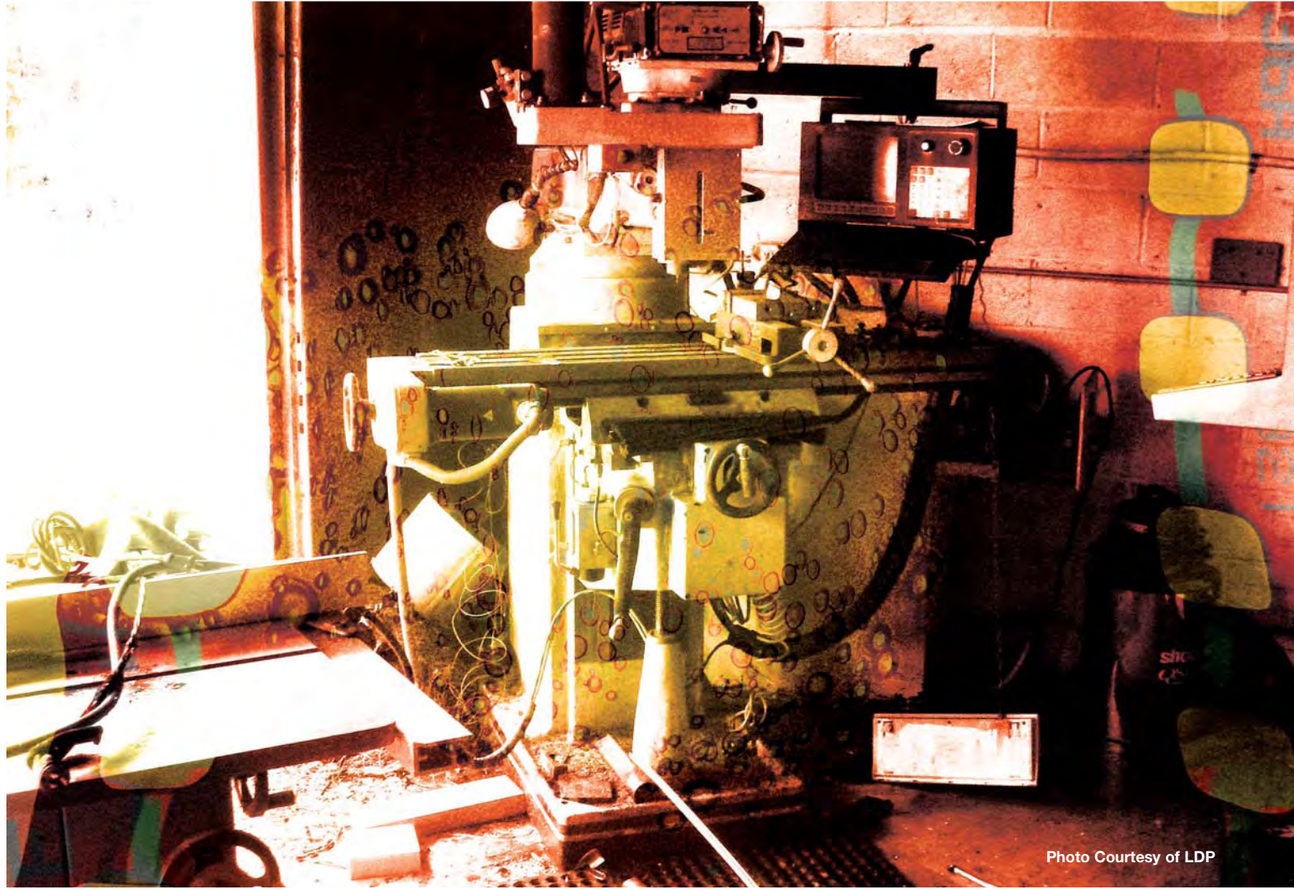

Photo Courtesy of LDP

In Dire Straits

But the fire left LDP in dire straits. Work in progress couldn't be delayed, and outsourcing would be difficult, if not impossible. An outside shop couldn't replicate the specialized techniques perfected by LDP through years of refinement. Lewis desperately needed his shop cleaned, repaired and repainted. And he desperately needed new machines.

"The shop had a hodgepodge of original core equipment that we'd purchased from a local equipment dealer," Lewis explains, "and a relatively new addition: a Haas TL-1 lathe that we'd bought used from an individual. We figured the dealer who sold us our original equipment had the resources to expedite insurance matters and rapidly get us back to normal," Lewis says. "So we called him." A salesman quickly stopped by, recorded some numbers, dropped off his card . . . and then, just as quickly, left.

LDP wasn't offered any sensible repair alternatives, or bankable install dates for replacement machines. "It's as if they said to us: 'Good Luck, but you're on your own,'" recalls David Soong.

Remembering a positive experience they'd had with another dealer a few months earlier, LDP realized they had other options. "When we first set up the Haas TL-1 lathe, we had some technical questions, and the Haas Factory Outlet over in Allendale (HFO Allendale, NJ) really helped us out," says Soong. "Even though we'd bought that machine used from a private party, the local Haas people gave us hours and hours of training, and treated our machine like it was a brand-new one they'd just delivered.

"In the back of our minds, we'd always thought: Haas is a big manufacturer – perfect for giants like Ford or GM, but not us. We're too small for them to bother with," says Soong. "Yet, they had been generous with their time and talent, and given us really super service. We decided we had nothing to lose by calling."

Photos: Richard Berry

A Clear-Cut Decision

"Right away, we realized the seriousness of the shop's situation," says HFO Allendale's Andy McGill. "So, first off, we offered to let them come in and use one of our showroom machines to finish up the work they had in progress. Then, we started looking for ways to get their shop back in business as quickly as possible."

McGill worked up a quote for a complete shop of new Haas machines that would greatly improve LDP's production capabilities, without requiring more floor space or busting their insurance-influenced budget. He then called the sales and production managers at the Haas Automation factory in California to begin coordinating expedited shipping and delivery for the beleaguered shop.

"We hadn't really thought about it – that some day we could become a whole Haas shop," says Soong. "Yet, we saw that they'd introduced smaller machines that would fit our situation perfectly. We began thinking: 1) Made in USA – 2) Great, great technical support – 3) A local dealership that really backs us."

"It was an easy decision," admits Lewis. "We went with the best, and as soon as we had the place painted and rewired, Haas delivered two machines. We were up and running within the week. The VF-2 vertical machining center came less than five weeks later."

Lewis also bought a new Haas rotary table, and had HFO Allendale refurbish and modify an old one that appeared to be salvageable. "That old rotary was probably the only thing that survived the fire," says McGill. "We changed out the motors to make it compatible with the new machines, so they saved a bit of money that way."

"Haas helped us out with tooling, trained our guys up at Allendale, and then trained them some more here in the shop," says Lewis. "Everything worked exceptionally well. Even the anticipated hassle of getting larger machines in and out of here went smoothly. We got a lot of specialized attention, and we're very happy."

While none of us can choose the timing of our inevitable disasters, the lesson learned from LDP is that we can choose to make the best of them. The "unthinkable" that Dan Lewis never saw coming instantly changed his small-business fortunes – and the machinists at LDP say they're genuinely better off for the experience. "The old hodgepodge is gone," says David Soong with a smile. "There's a complete new shop here now. It almost looks like a Haas showroom."

When asked about the old saying that "lightning never strikes twice in the same place," Dan Lewis replies. "That's actually a logical assumption. You see, after a first strike, the same old place just isn't there anymore."

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SIDEBAR

The Perfect Machined Illusion

Lewis Design and Planning machines a lot of "full integral" hollow acrylic bottles that appear to be filled with liquid. The illusion is so perfect, you really can't tell the model from the final product. But the prototypes are actually more perfect.

"You can see our acrylic bottles have the same 'glass' distribution as a molded production bottle, but without the gravity problems real glass displays," explains Dan Lewis. "No matter how beautifully you mold it, glass tends to slump on the inside."

The insides of Lewis' impressive machined bottles are as finely finished as their outsides. The apparent "liquid" contents filling most of the inside volumes are actually separate colored solid models, just as perfectly finished as the bottles. "Through 20 years of trial and error, we've figured out a way to close the bottom so we have a completely sealed, full-integral hollow bottle without seams," boasts Lewis.

The prototypes are used for design evaluation, market testing and production planning within the perfume industry. Since they reflect light and transmit color so perfectly, they often become the photogenic "heroes" of the clients' advertising campaigns. More often than not, that beautiful glass bottle you see in an expensive magazine ad . . . isn't.