Desa (http://www.desaint.com/) is a leading international manufacturing firm with divisions in Germany, Poland, Italy, Mexico, England, and the U.S. Formed in 1969 by absorbing Remington Arms’ chainsaw operations in Chicago, the company acquired Koehring Corporation’s portable outdoor kerosene forced air heater operation in Bowling Green, Kentucky in 1981. Expanded with other purchases, Desa’s Bowling Green operation became its Consumer Products Division, eventually making outdoor portable and indoor space heaters under the brand names Comfort Glow, Vanguard, ReddyHeater, All-Pro, Glo-Warm, Outdoor Leisure and Universal; hearths, stoves, and fireplace systems as HearthSide and Design Dynamics Fmi; motion activated lighting, door chimes, and wireless lighting controls as Heath Zenith, and power tools for construction and lawn/garden care as Remington, Powerfast and Master.

DESA, like other successful manufacturing companies, knows time-to-market is crucial given how tough the competition can be now. Reducing that time without sacrificing quality often means that rapid prototyping is crucial to the project’s success. Since the mid-1980’s, “rapid prototyping” (RP) – making a fast scale model of the desired object from a computer assisted design (CAD) file – has been a crucial tool in the race. RP models (typically made by changing a liquid photopolymer to a solid using light from a laser) can speed development time by being used for testing, visualization, communication between teams and clients, and even to make the tooling needed for injection molding. There’s nothing like a replica of the part to enable designers to spot and correct potentially costly mistakes early in the design process, when changes are still relatively inexpensive. RP also makes it easier to produce many variants of a product or to customize it.

Desa’s project needed a fast and flexible prototyping service to quickly and accurately make silicone rubber molds and use them to cast parts in polyurethane for assemblies – end cap, fan guard, control box – destined to become part of the new heater. To add to the challenge, the job required using a high temperature resin that would stand up to the heat.

To find the right service they did something that might seem unusual – they went to college. That way, they not only found a good RP service but experts working with high temperature; they didn’t have to go far, just up the road to the University of Kentucky’s Center for Manufacturing. The center’s full service facility has been in operation for 16 years and is equipped for vacuum casting (MCP 003 and 004PLC), high speed machining (HAAS VF2), vacuum

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Case Study

forming (Formech 450), concept modeling (Zcorp 402C and ZW4 Waxter), injection molding (Cincinnati Milacron ACT100B), as well as stereolithography systems for rapid prototyping (3D Systems SLA 3500 and SLA 250).

More important for Desa’s purposes, DSM Somos®, a leading developer of stereolithography (SL) resins for the rapid prototyping industry, had enlisted UK’s RP team to help test new advanced resins capable of handling high temperatures; one uses nanotechnology and the other involves a special composite used as a heatsink. “One can handle material as hot as 500 degrees,” says UK’s RP manager, R.J. Robinson. “The other can go as high as 600...so we were asked to see if they can be used for rapid tooling.”

Desa came to UK for much the same reason: their ability to handle rapid tooling of parts for high temperature situations. They also saw advantages in partnering with an RP facility embedded in a well-respected research university’s engineering college. “If our customers need the help, we can call on faculty experts in all kinds of engineering fields,” R.J. explains, “including composites and nanotechnology. We also have access to testing equipment you don’t see much outside of a university environment.”

None of this available expertise meant the job was going to be easy, however. In fact, R.J. acknowledges his team had some “hair-pulling moments” before they got past the tough places. For one thing, the parts Desa needed were not smooth and flat but complex intricate shapes with problematic features like blind holes and deep cores. Just to make things more interesting, they needed to snap-fit in the assembly.

“That’s one reason we turned to UK,” says Desa’s Eric Pitchfold. A UK engineering grad himself, he knew what the RP team could handle. “Knowing we have people who can mold pretty much whatever we design gives our team a lot more flexibility and confidence. If we come up with something new and cool, nobody at UK is going to shake his head and say, ‘Sorry, can’t be done.’”

How did it go? “Great,” Eric says. “Turnaround time was excellent, they worked with us when we had to change quantities, they turned out exactly what we needed when we needed it.” He passed the word to other engineers at DESA and now they are also Center clients.

Moral of the story: when you’re looking for help with product development (among other things) don’t just look in the Yellow Pages. Check the colleges and universities in your area to see what kinds of labs and services they offer to industry. If your problems are sophisticated and highly technical, a research university like UK is likely to have the experts and the equipment you need.