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### **Washington Manufacturer Finds Abrasivejet Machining Cost-Effective Cutting Answer**

Mike McDonald, owner of Keller Machine and Fabrication, Inc., will be the first to admit that he used to be one of abrasivejet machining's greatest skeptics.

Mr. McDonald worked in the industry for 17 years before buying Keller Machining and Fabrication, Inc., based in Kent, Washington. "I wanted to use KMF to help customers solve specific problems and, in doing so, take advantage of other possible markets for the solutions we created."

Finding other markets would be tough--the industry was in a severe slump at the time, and KMF was doing anything it could to stay afloat. Moreover, job shops that had been surviving on the aerospace industry were now competing for KMF's bread and butter--industrial manufacturing and machining.

Mr. McDonald says he was reluctant to use abrasivejet machining as a solution to the company's problems. "They're a lot different from other machining tools because they have so many parameters that have to be controlled; in other words, they can be extremely difficult to use. Years of industry experience taught me that good software was the key to making abrasivejet cutting viable, yet I'd never seen software good enough to do the job." That is, until he found out about technology developed by OMAX Corporation, in Auburn, Washington.

OMAX manufactures the JetMachining center--a state-of-the-art, integrated system consisting of a high-accuracy motion controller, an ultra-high-pressure pump, an abrasivejet delivery system, and a two-axis machining table. It will cut flat parts out of virtually any material up to two inches thick, directly from a CAD drawing. In addition, the JetMachining center can profile complex shapes to tolerances within  $\pm 0.005$ " or better.

The JetMachining center's powerful control software runs on a standard IBM-compatible PC. The software includes a "Compute First-Move Later" motion control system, as well as an "expert system" that models the cutting behavior of the abrasivejet tool. In this way, the JetMachining center automates most programming and tool set-up work, practically eliminating the need for special skills or prior experience on the part of the operator.

"The JetMachining center allows us to build a better piece of custom machinery in less time, and with greater ease, than with any other method. It also makes it easier to cut parts into complex shapes, thereby allowing you to use a simple part for multiple functions. In addition, it allows us to see each part displayed in color on a computer screen, and fix design problems in a fraction of the time it would take to search through lines of computer code. As a result, we're able to make parts aesthetically pleasing, as well as functional."

"For example, a few months ago we custom built a large production line machine," says Mr. McDonald. "The customer needed it right away, to replace an old machine that was worn out. But our shop was very busy at the time, leaving us short on traditional resources, so we had to rely on abrasivejet machining instead."

"What surprised us most was how the speed and accuracy of JetMachining made it cost-effective and simple to make finished parts. Best of all, the end product was fantastic; the customer was extremely happy with it, and the operators liked it better than their old machine." Mr. McDonald adds that JetMachining allowed KMF to complete the job nearly 30 percent faster than it could have using traditional resources. "Compared to constructing custom machinery the old-fashioned way, the cost of JetMachining is incredibly low."

Unlike many traditional milling processes, JetMachining is extremely efficient. It doesn't waste as much material, nor does it require multiple tools to do different jobs. And when users can reduce waste from materials costing \$5.00 or \$10.00 per pound, the savings can be considerable.

Conversely, the JetMachining center allows the operator to cut and bore in just one step. "We can do everything at once, on one machine," says Mr. McDonald, "without moving parts around or re-loading DXF files. It saves us time, increases our accuracy, and makes us more competitive."

KMF Machine doesn't hesitate to "push the envelope" of their abrasivejet capabilities, either. They have enough trust in the JetMachining center to use it for finishing edges on four-inch thick hardened stainless steel parts--two inches *over* what the manufacturer suggests.

Thanks to Mr. McDonald's perception and state-of-the-art abrasivejet technology, KMF is stable and growing. The company now offers abrasivejet machining, contract manufacturing, custom machinery production, and machine design services.

"The OMAX JetMachining® Center can't do everything a conventional milling machine can do," says Mr. McDonald, "but it comes close, and for a lot less money. It's precise, easy to use, and I believe there are many things you can do with it that aren't even obvious at this point. It's truly a machine for the future."

