

3D STONE INCORPORATED

ALPHACAM STONE INCREASES PRODUCTION OUTPUT



Indiana limestone fabricator
3D Stone increases
production output by 20
percent with CNC machinery
and ALPHACAM Stone

Superior finish is vital for limestone fabricator 3D Stone Incorporated, a 26-year-old company that increased output without sacrificing quality by implementing the right combination of CNC machinery and CAD/CAM software.

Based in Bloomington, Indiana, 3D Stone performs a wide range of commercial work, including a large number of jobs for government, community worship, colleges and universities, as well as custom luxury residential projects.

"We do interiors, exteriors, and monuments — wherever the stone can go," says Vice President of Drafting and Project Development Shawn Culbertson.



“As far as the profile, clarity and the finish of the surface goes, ALPHACAM does that really well. Everyone who has seen the finish is impressed. We have been able to increase production by 20 percent — and that includes a lot of ornate work.”

Shawn Culbertson, vice president of drafting and project development

“We have a highly experienced crew, which allows us to do very large, ornate projects. When it comes to producing anything from a small fireplace to a large university project, we’re able to fulfill all of the required facets and get the pieces out the door. We can do every facet of the process, from picking out blocks at the quarry to fabricating intricate carvings, and that makes us successful.”

The company works closely with customers to achieve desired results and, though project plans sometimes begin with customer drawings scrawled across paper napkins, they end with masterfully crafted limestone pieces that are often ornately detailed. “Even though they may send renderings, we create a lot for our customers and we get our hands dirty with the development,” Culbertson says.

Culbertson was experienced with CNC production prior to joining 3D Stone nine years ago and quickly embraced the change when new ownership opted to implement CNC machinery and software to increase output.



In 2016, 3D Stone purchased a custom-designed APEX 5-axis stone-cutting CNC machine from Park Industries of St. Cloud, Minnesota. The machine was the first of its kind and was built to cut intricate designs at high speeds. A CNC solution initially purchased by 3D Stone to program the new machinery didn’t provide the level of control that the company needed with its detailed projects, and this resulted in poor finish quality. “We ended up having to get rid of the first system because it didn’t fit within the realm of our production,” Culbertson says.

To maximize the high-production capabilities of its new machinery, 3D Stone transitioned to the ALPHACAM Stone computer-aided-manufacturing (CAM) solution. With ALPHACAM Stone, the company was able to achieve both masterful finish quality and less complex programming control.

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The implementation of ALPHACAM Stone also resulted in a reduction of required processes, as the company was able to perform multiple operations with fewer setups. The ALPHACAM team customized the solution’s post processor for the APEX, which ensures that the machinery and software operate seamlessly.

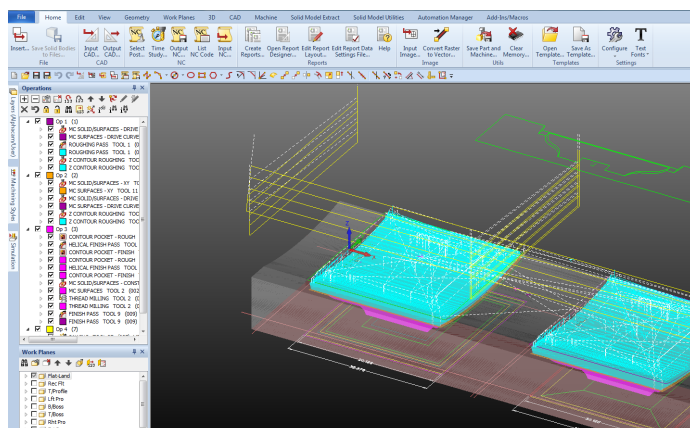
“I was already very familiar with ALPHACAM, which gives us the kind of control we need with the intricate jobs that we do. We can skip a lot of processes because we can do several different items in one shot. We transitioned 100 percent to ALPHACAM because it’s the best way we know to get the material out there.”

In addition to eliminating some of its processes, 3D Stone has implemented lights-out manufacturing with ALPHACAM Stone. “When it comes to the carving and radial work that we have to do by hand, the time savings has been great, but the lights-out production and the accuracy are the biggest benefits — plus being able to skip two or three processes because you are able to go more quickly from a slab to a finished piece.”

Though the solution is able to create and import both 2D and 3D geometry, Culbertson prefers ALPHACAM Stone to some of the other CAM systems he’s used because it allows him to work in 2D — which equates to time savings and greater overall efficiency. The system is able to contour 2D geometry using tools of various sizes and shapes, as well as generate the profiles of form cutters and control their diameters and programming depth points.

“In most CAM systems, you have to either build a wireframe or work with an IGES or STL file, but with ALPHACAM I can take 2D geometry and provide section lines for the profile without having to build anything, or spend hours developing,” says Culbertson, who adds that 3D stone also works with CAD files in 2D format.

“For us, the benefit is the simplicity of not having to create something in ALPHACAM; we can have circles and radii, and they all work in 2D format. Everything that we draw is two-dimensional.”



Automation tools available in ALPHACAM Stone eliminate repetitive tasks, which contributes to increased production while simultaneously implementing a higher level of standardization. One such tool is the system’s tool library — where cutting tools and associated data can be stored — as it paves the way for fast and accurate tool selection.

Machining styles are also helpful, time-saving tools, as they can be used to quickly apply preferred cutting methods to any program consisting of one or more operations. Machining styles are typically used to cut and polish contours with multiple tools, and are essentially reusable, customizable templates created by programmers to save time. They can be created initially for a single program, then saved under a unique name and applied again and again to any geometry. This helps programmers reduce repetitive tasks for similar operations requiring several tools for the same geometry, which cuts programming time and reduces error.

3D Stone also pairs ALPHACAM Stone with scanning technology by scanning intricate stonework, generating STL files, and importing those files into ALPHACAM to create G-code. While scanning works in the reverse engineering of existing pieces that are wholly intact, the company has also contracted artists to build clay models for scanning purposes.

“We have a large quantity of sculptures that, if we had to do them by hand, would take up a mill’s annual production,” Culbertson says. “Instead, a CNC mill is able to do 85 percent of the work.”

Case Study Summary

Company name: 3D Stone Incorporated

Business: Limestone fabrication

Website: www.3dstoneinc.com

Key benefits achieved

- Twenty percent increase in production
- Superior surface finish
- Increased accuracy
- Ability to perform lights-out production



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