Traditional craft industry with a bright future

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Woodcarvers are turning high-tech. Credit: Fraunhofer IPA

Mary and Joseph, the angels, the manger -- at Christmas time, lots of people still decorate their homes with high-quality wooden figures depicting the nativity scene. Now, the wood carvers of South Tyrol are moving over to high-tech production methods.

A South Tyrolean craftsman wearing ear protection carefully guides a tool arm over a master figure, producing forty or more mini-copies of the original at the cutting machine next to him. This kind of pantograph machine has long been the traditional means of manufacturing wooden figures in many of South Tyrol's valleys.

"Pantographs are often given away in children's magazines and comics. Kids love them. With just a pencil and paper, they can reproduce their

favorite characters on whatever scale they like, and then hang the posters on their wall. The same principle applies here, too - only in this case, we're talking about producing high-quality wooden carvings," explains group manager Jürgen Goetz of the Fraunhofer Institute for Manufacturing Engineering and Automation IPA. "First, an artist produces Mary or Joseph by hand, perhaps cast in bronze or brass. Then a colleague at the pantograph traces the figure and the carving machine produces copies." This traditional way of working has its disadvantages: It's loud, dusty, and the unenclosed machines are a hazard to workers. Additionally, it often takes several months before even a small production batch is ready for dispatch. The artist must first produce a design, then create a master figure; only after that can manufacturing begin.

On behalf of the company 3D Wood, Goetz' s team of scientists have now developed a new workflow for this traditional branch of woodworking. First, a 3D scanner traces the original, or else data is input from a CAD program. Then a software package processes up to 50,000 scanner data sets of the design model, producing the basis for a CNC program which controls the milling machine. Goetz reels off the technical details: "The 3 meter by 3 meter by 8 meter machine is fully automated, has five simultaneous axes, operates at up to 40,000 revolutions per minute, automatically swops tools, and stops immediately if any malfunction occurs. It produces 42 extremely high-quality copies simultaneously, and their size can vary anywhere between 10 and 600 millimeters." Using this automated process, figures can be turned out in less than half the previous time - and their quality is better too.

This new way of working cuts the time between design of the master and manufacture of the end product from several months to just a few weeks. The artist can even make the master out of soft wood or wax, which is in turn much quicker than casting a figure in bronze and enables work to begin sooner on new contracts. And let's not forget another

happy side-effect: workers no longer need to be exposed to high levels of noise and dust.

Source: Fraunhofer-Gesellschaft (news : web)