



GRAHAM ENGINEERING

Press Release

York, Pennsylvania, USA

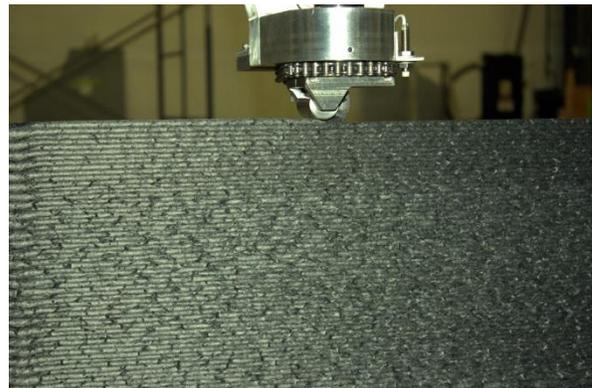
October 19th, 2015

CNC LEADER THERMWOOD CORPORATION LEVERAGES AMERICAN KUHNE EXTRUDER, EXPERTISE FOR INITIAL START UP & TEST OF LARGE SCALE 3D ADDITIVE MANUFACTURING SYSTEM

Testing included initial validation of patent-pending ‘MeltShape Technology’, a new technique for enhanced control of layer shape & improved bonding between layers

Following the July announcement of its large scale additive manufacturing (LSAM) program, American Kuhne customer Thermwood Corporation, a leading US-based manufacturer of CNC routers, today announced that its development system performed well during initial additive testing through its entire operating range.

Kevin Slusarz, American Kuhne vice president of process technology, assisted in the start-up effort. ‘It is my pleasure to support Thermwood beyond the design phase. This was a good opportunity to combine our polymer processing know-how with Thermwood’s CNC technology expertise to advise optimizations to melt piping & tooling design for this unique application,’ he said.



Test part made with a 20% carbon fiber filled ABS. The company plans to work with material vendors, R&D organizations and potential users in the ongoing development effort.



The system’s 1.75” vertical extruder from American Kuhne is fully integrated to provide precise material distribution

Thermwood’s development system is supplied by a 1 ¾ inch American Kuhne extruder custom engineered for this application. ‘Although it’s a demanding application, our extruder performed flawlessly during initial testing,’ said Thermwood chairman & CEO Ken Susnjara. ‘We are quite pleased with our selection of American Kuhne as our development partner in this effort, not only for the quality of the equipment, but also for the service & support,’ he added.

Thermwood expects to fit this initial test machine, which can print parts up to ten foot by ten foot by five foot thick, with a five axis ‘subtractive’ gantry trim system in the next few months. This will enable the system to perform both the ‘additive’ and ‘subtractive’ functions on the same machine. Called ‘near net shape’, this approach uses a high volume thermoplastic printer to quickly create a part that is nearly, but not exactly, the final net shape. The ‘subtractive’ function then machines the part to the exact final net shape.

Testing included initial validation of an all new ‘MeltShape Technology’ for enhanced control of layer shape and improved bonding between layers, a new and promising technique in the advancement of LSAM. This new patent-pending

approach uses one or more shaping wheels to shape, form and compress the hot plastic melt as it is being extruded, insuring that each new layer is the proper shape and thickness and that it bonds firmly to previously applied material.

Thermwood plans to continue this development effort with the goal of offering these machines in a variety of large sizes for commercial applications, specifically targeting aerospace patterns and molds. Management cannot yet determine when the technology might be sufficiently refined for commercial rather than purely research and development applications. Thermwood plans to work with material vendors, R&D organizations and potential users in the ongoing development effort.

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The Graham Group acquired majority interest in American Kuhne in 2012, followed by Graham Engineering Corporation's acquisition of Welex in June 2013. Together, Graham Engineering, American Kuhne, and Welex create a convergence of leading technologies, people, and capabilities in extrusion. Graham is a privately held company headquartered in York, Pennsylvania, USA.

Graham Engineering is the global standard in wheel and industrial extrusion blow molding solutions, with 400 installations in 20 countries. Graham Engineering offers package design, product development and processing expertise, along with monolayer, multilayer, and barrier extrusion blow molding equipment and technology upgrades. Visit www.grahamengineering.com.

American Kuhne is the preferred provider of engineered solutions for plastics, rubber, and silicone extrusion. American Kuhne solutions comprise standard and custom single screw extruders, feed screws, extrusion systems, and specialized turnkey systems for laboratory, medical tubing, narrow web, wire and cable, pipe, tubing, and profile applications. Visit www.americankuhne.com.

Welex is the global standard in high performance sheet extrusion solutions, with over four decades of leadership. Welex solutions are installed in more than 3,000 customer locations in 69 countries. The company's innovations include co-extrusion and multi-layer methods that lead the industry as well as dozens of barrier lines installed globally. Visit www.welex.com.

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Thermwood is a US based company with dealers and distributors worldwide. In addition to machine manufacturing and software development, Thermwood has a technical service organization that provides support, machine installation, training, retrofits, custom programming and production assistance. Visit www.thermwood.com.