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Harper Designs Unique Furnace System with Dual Functionality for R&D of Carbon Related Products from Renewable Resources

Buffalo, NY – Harper International Corp. recently developed a unique furnace system with dual functionality for a national laboratory engaged in research, development, and commercialization of new advanced materials.

Oak Ridge National Laboratory (ORNL) is researching the development of a wide range of carbon materials from renewable resources. Advanced carbon materials derived from renewable sources would replace products currently derived from petroleum. The objective is to provide products with similar functional quality at a lower cost thereby increasing the applications for these advanced carbon materials.

To simulate commercial production of carbon materials, a continuous thermal processing system was selected by the ORNL research team. Precursor materials planned for this development project have a wide variation in both particle sizes and particle shapes. These variations in precursor materials would require two distinctive types of furnace systems, a rotary furnace for one type of material and a mesh belt furnace system for other materials.

ORNL contacted Harper International for assistance in designing a single continuous thermal processing system that could satisfy both requirements. Harper's engineering team developed the dual functionality furnace due to limited space within the lab, and the need for flexibility in processing a wide variety of materials in both rotary and mesh belt furnace systems. The Harper team designed a multi-functional thermal processing system that can be transformed from a rotary tube furnace to a mesh belt furnace while utilizing a single thermal platform.

"The design of this custom furnace system demonstrates the commitment Harper makes to provide solutions, investments, and new concepts to achieve the needs of our valued customers," said Rick Rehrig, Harpe r Vice President of Sales. "The world of advanced materials continues to change at an accelerated pace. The engineers and scientists here at Harper International provide custom solutions and technical assistance for the economical commercialization for the advanced materials industry."

The single thermal processing system features a clam-shell design that allows the top half of the furnace to open, exposing the internal section of the furnace. The rotary tube may be removed from the system, allowing for the installation of a mesh belt within the same thermal section of the furnace. Both furnace systems have been designed to be gas tight and operate with a variety of atmospheric gases including reactive and corrosive gases.

The systems have been designed to operate in the 1000°C range with thermal processing cycle variations from 30 minutes up to 10 hours. ORNL will have the flexibility to test and develop new carbon materials from a variety of sources, including renewables.

Advanced technology due to the research and development of advanced materials is now considered the norm. Cell phones, solar cells, nanomaterials, flat-screen displays, lithium ion batteries, advanced catalysts, and carbon fiber are all fairly standard items in today's world. Harper International has played an important role in assisting companies with the development and commercialization of many of these advanced materials with their highly engineered thermal processing systems.

About Harper International

Harper International is a global leader in complete thermal processing solutions, as well as technical services essential for the production of advanced materials. From concept to commercialization, from research scale to full production line operations, Harper is perpetually on the cutting edge. Since our founding in 1924, we have pioneered some of the world's most innovative, customized systems, with a focus on processing materials at high temperature and in non-ambient atmospheres. For additional information about Harper, please visit www.HarperIntl.com or email us at info@HarperIntl.com.

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