

Syracuse Firm Develops and Patents Circuit Board Recycling System

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Jim Moltion, an electronics engineer, has been in the electronics recycling business since 1995 when he started Northeast Surplus & Materials, LLC in Syracuse, N.Y. It did not take long for him to grow alarmed by the volume of electronic waste, and he set out to find a way to efficiently and safely recycle parts and materials from discarded circuit boards and computers profitably in the US.

He came across a white paper in 1999 compiled by CTC Technologies, a vendor for the US Department of Defense listing all the "Needs" to process circuit boards for metals and obsolete parts. It was called the DOD "DEER2" project. Jim had an idea and sought some funding along with his own capital and using this paper as a "blue print" started experimenting on methods to recover parts without damage for reuse for repair of older military equipment spares, meeting the "needs" statements of the CTC DOD report.

"Right now, most all old electronics and computer equipment is being shipped to China, India, Africa or Pakistan, where in most cases it's dumped in a big heap and set on fire to recover just the metals. All the plastics are burned off and the smoke enters the easterly trade winds and now rains down on us about five days later," Moltion said. "This system will allow almost 100% recycling of all e-waste here in the USA and create meaningful and sustainable jobs in the US. Most US ewaste is sold by "recyclers" for pennies a pound overseas. What is really happening is the valuable precious metals are being shipped out of the US at an alarming rate for pennies. There is a big push by Federal and State governments to make the manufactures take the equipment back. The manufacturers are not equipped or have the knowledge to handle this material here and they often give to non profits to sell or sold to third parties that do the overseas shipping. This only delays the inevitable; it still ends up on the curbs, in our landfills, or overseas, and the accountability chain has been broken."

Companies that are providing chip and parts removal today, typically employ a heat-and-release process that uses hot plates, heat guns or hair dryers to separate parts from the boards, a labor-intensive process that exposes workers to toxic fumes, and is very inefficient," Moltion said.

His patented circuit board recycling system, which he completed the working prototype in 2005, "depopulates" parts and chips without damage and made ready for refurbishment and reuse. It uses heat, but not heat as you know it," Moltion said

The process has a fairly small foot print, low labor costs, as the system is semi-automated. During processing the metals are "cleaned" of unwanted metals before shipment to a refiner or smelter, and pure hydrogen gas is a by product. Using a common household chemical, the metals are reacted and the class II metals are dissolved and later recovered. The hydrogen gas is used for heat for the process, and generating electricity. The system makes more clean fuel than it uses. When hydrogen is burned, water vapor is the only exhaust product.

He declined to elaborate on what happens inside the 2-foot-by-10-foot box in which the parts are depopulated, citing proprietary concerns. After the parts come off the board, they have to be sorted by hand at this point, but Moltion said he is working on an automated neural network process to handle that task as well.

The system can remove more than 3-500,000 parts per week during a typical 40-hour work week, according which equates to about 6-7 ton's of circuit boards per week. It depopulates a typical mother board every 9-12 seconds.

The remaining unusable parts and the now depopulated boards are sent to a size reduction system and then to a water based separator; metals one way; non metals the other.

"At the end of the system's two combined processes, virtually nothing is left of the computer's electronic devices or toxic parts to go into the waste stream," Moltion said. "Everything is recovered or made into reusable resources and commodities. It's important that these electronic items do not make it into our landfills, as many contain very toxic materials."

Northeast Surplus & Materials is speaking with several U.S. computer and recycling firms about moving his technology to commercialization and production in Syracuse, NY. Funding is being sought to commercialize the system for manufacturing in Syracuse, creating many local jobs.

For more details, contact Jim Moltion at (315) 476-4025 or visit www.northeastrecycle.com.

