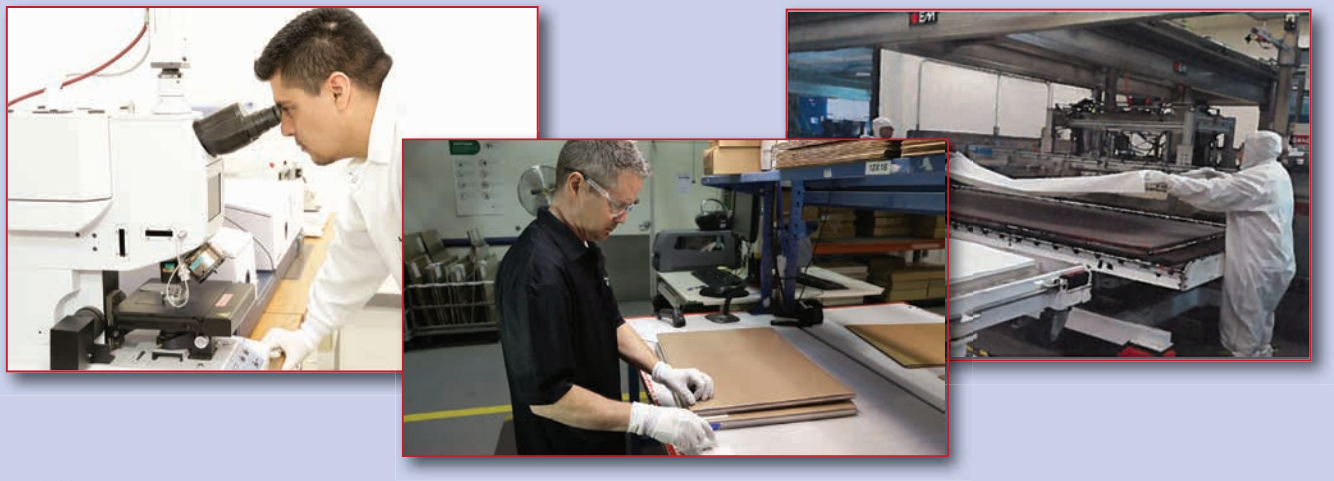
Getting Laminated Rogers Corp.



At IMS2015 in Phoenix, it was only a short ride over to Chandler, Ariz. for a tour of Rogers Corp.'s U.S. production facility. The Chandler manufacturing site does relatively low volume, high mix products for the company, in contrast to the Asian facility that is automated for higher volume products. About half of Rogers' business is in the U.S./European markets with the other half from Asia, totaling about $600 million in revenue. Rogers has segmented their business into three main groups – Power (e.g., power electronics), Protect (e.g., high performance foams) and Connect (e.g., PCB laminates).

The tour took everyone through the steps to produce PCB laminate products such as RO3000®, RT/duroid® 5000 and RT/duroid 6000. The raw material for these products is made in Rogers' corporate headquarters in Rogers, Conn. and shipped to Chandler for processing. For these products, sheets of the dielectric are plied together in a Class 10,000 clean room to achieve the final dielectric thickness desired by the customers (final thicknesses can range from .001" to 0.5"). Then, cladding is performed, where the dielectric plies are assembled with sheets of copper foil and built into a "book." Each laminate stack-up is interleafed with a stainless steel separator or "caul plate." Depending on the application, they also add layers of PTFE, woven glass or thick metal plate.

Next, the books are grouped together into a lamination press where they experience heat and pressure over a specified time causing the layers of dielectric and copper foil to bond together. The cycle properties vary depending on the materials and thicknesses involved. Following the lamination process, the books are disassembled and the finished laminates are sent for shearing/sawing into their finished sizes. Test sheets from each press load are sent to QA for electrical testing.

Laminates with very thick dielectric or with heavy metal backing are cut to size on a radial arm saw while thinner laminates are cut with a shear. Dimensional measurements are made on each product and entered into the statistical process control database. A visual inspection also takes place prior to packaging. The packaging team members use wireless barcode scanners to ensure the correct material is going into each order that is heat sealed with shrink wrap, boxed and sent to shipping.

Other laminate types utilize the treater where woven fiberglass is impregnated with different grades of RO4000® resin. The prepreg is then used as a bond ply or in the construction of copper clad laminate. Stacks of RO4000 prepreg are interleaved with copper foil and laminated in a large press.

Rogers has a R&D lab equipped with a high frequency network analyzer, a PIM test for testing passive intermodulation, power amplifiers for RF power testing, a thermal imaging camera for thermal management studies and multiple test fixtures and set-ups for electrical characterization. The engineers use the lab for testing new materials and methods for future products.

With more than 180 years in business, Rogers is one of the oldest companies in our industry. They supply a wide variety of high performance PCB laminates along with many other products that help power, protect and connect our society using unique, tightly controlled processes to provide the best products to their customers.

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