

SSL Postings



Although you do not often hear about growth in domestic manufacturing here in the United States, the solid-state lighting industry is steadily growing and establishing a manufacturing presence here at home. Solid-state lighting was not only born of U.S. ingenuity and R&D, but is riding the crest of a worldwide trend toward greater energy efficiency. This offers a golden opportunity for U.S. manufacturing to take a significant role in SSL. From time to time, these Postings will focus on SSL companies manufacturing here in the U.S., a series we call "SSL in America." This is not intended to endorse or promote any of the companies, but rather to describe advances in energy-efficient solid-state lighting. The activities you'll read about here are consistent with the [U.S. Department of Energy \(DOE\) white paper](#) "Keeping Manufacturing in the United States," which grew out of DOE's 2010 SSL Manufacturing R&D Workshop.

Rubicon Technology, Inc., is a U.S.-based manufacturer of sapphire substrates. The vast majority of those substrates – about 70 percent – are used to make LEDs. The rest are used to make radiofrequency integrated circuits for cell phones and other products, and in the manufacture of optical lenses and windows that are used in medical equipment, aerospace and defense technologies, and other specialized uses.

According to CEO Raja Parvez, Rubicon is one of the world's largest manufacturers of sapphire substrates and exports them all over the globe from its base in Bensenville, IL, which is just outside of Chicago. The company has been manufacturing sapphire

substrates for LEDs since its founding in 2001. All of its sapphire crystals are grown near Chicago, where Rubicon has three separate factories. In fact, says Raja, the company plans to open a fourth factory in the vicinity, because its current production capacity is not sufficient to meet demand. Roughly 160 people are employed at Rubicon's various U.S. facilities.

Rubicon recently opened a cutting and polishing facility in Malaysia to make large-diameter (6") sapphire wafers, which is also done at one of the company's Chicago-area facilities. Raja explains that the Malaysia location was chosen because of its proximity to Rubicon's many Asian customers. He says his company does the bulk of its manufacturing in the U.S. not just because Rubicon is an American enterprise, but also for a number of other reasons.

One is that electricity is an extremely critical element in the manufacture of sapphire substrates, so it's very important to have an electric grid that's both dependable and stable. Electric outages and voltage spikes, both of which can be disastrous for a manufacturer such as Rubicon, are less likely to occur here in the U.S. than overseas – a decided advantage.

Another reason to manufacture in the U.S., Raja says, is to protect intellectual property. Rubicon has diligently developed, refined, and automated the technology for growing sapphire crystals, even building sapphire growth furnaces to its own specifications, and the company wants to keep all of that proprietary, which is easier to do here in the U.S. Raja notes that because Rubicon's crystal-growing process is highly automated, lower overseas labor rates are less of an incentive to move operations offshore.

Last year, he says, Rubicon added another capability when it began doing its own purification and densification of powdered aluminum oxide – the raw material from which sapphire substrate is made. This step, too, is done in the U.S.

Rubicon Technology is among a number of companies that are working to create and strengthen a solid-state lighting manufacturing base here in the U.S. This will not only help bring significant energy savings through more efficient lighting products, but will benefit our economy by adding jobs at multiple levels of the supply chain.

A survey of U.S. employment and job growth in the SSL industry is now being conducted by the [Next Generation Lighting Industry Alliance](#) (NGLIA). Administered by the National Electrical Manufacturers Association, NGLIA is an alliance of for-profit lighting manufacturers formed to accelerate SSL development and commercialization through government-industry partnership. NGLIA members collaborate with DOE on diverse activities in support of SSL core technology research, product development, manufacturing, demonstration, and market conditioning and outreach. To participate in the NGLIA survey, contact NGLIA at nglia@nema.org (all information provided will only be used in the aggregate and will be kept confidential for each company).

As always, if you have questions or comments, you can reach us at postings@lightingfacts.com.
