





## An Update on the Rogers Material Supply Line

by **Barry Matties**  
I-CONNECT007

As part of a recent I-Connect007 supply chain survey, we found that RF laminate material can be very difficult to obtain. Rogers Corporation was named specifically in our survey as one supplier with a limited amount of material available. In fact, their delivery time was reported as being as high as 55 days for some materials at one point. In an industry where quick turnaround time is critical, this is one supply line that killed any hope of being quick.

Because Rogers was noted by name in our findings, we decided to go to them to learn about the current situation, and the short answer is that there has been improvement on delivery lead time with the promise of continued improvement.

The following interview is with John Pavlak, the director of global operations at Rogers Corporation.

**Barry Matties:** *John, can you please give us an idea of what happened to your supply line and explain what you are doing to improve.*

**Pavlak:** I can give you the story as I know it from my two years so far at Rogers. When I started in mid-2013, we had a plan to increase capacity because our market intelligence said that there was significant demand coming and it was primarily tied to the China 4G roll-out. The only difference between our plan and what actually happened, the 4G roll-out actually came in sooner than our original marketing intelligence. Fortunately, we had already kicked off projects to increase our global capacity. The challenge was that those were long lead-time and very expensive projects. We've invested more than \$30 million in the past three years into global capacity projects.

We had ourselves locked in tightly with different OEMs and fabricators, but the wave of demand came sooner than expected, so we spent the latter half of 2013, and almost all of 2014, working very hard to increase capacity in other ways before that additional capacity came online. Every one of our locations in the global regions added capacity through internal improvements on throughput and figured out how to get more lamination press loads per week. All of our teams pushed very hard and each of the regions were able to demonstrate at least another 20% of additional capacity, even without the new equipment.

We did everything we could internally to turn the screws to give ourselves more capacity. In the past, we would let our different regions control how they would prioritize orders to our customers, but because we were capacity-constrained and our volumes were above capacity, and we knew that was going to extend for a period of time, we actually went into a capacity allocation mode. We decided on how to allocate globally, so we improved our response time to a lot of our largest customers by prioritizing and setting aside lamination press loads for them, so they knew they had those to count on. Even

**AN UPDATE ON THE ROGERS MATERIAL SUPPLY LINE** *continues*

though we extended lead times, our customers knew they had a defined amount of capacity reserved for them. It was not a fun time for our customers or us because the global demand exceeded our global capacity.

In the midst of that period, in Arizona alone, we were able to produce 36% more laminate in 2014 than we did in 2013. In China it was approximately 25%, and about 18% more out of our Belgium factory. When you aggregate it all together, it was well over 25% improved global throughput. Now we have the new capacity online; we added a thermoset treater in China for the RO4000 product line. It's a treater for creating the dielectric material we call pre-preg that goes into the laminate we make. We added 50% additional global pre-preg capacity when we brought it online in China, and it's up and running at full production speeds. On this treater we started the internal qualification in the latter half of 2013, and in 2014 we ramped it up from one shift, to three shifts, and we've moved that pre-preg production into China where the majority of our customers are. Now we have much significantly more pre-preg capacity than we need globally, so we are back ahead of the demand growth curve and are probably good for the next three years when we believe we'll need to introduce some additional pre-preg capacity.

From the lamination side, we had two large expansion projects in lamination going on, as far as new capital equipment. We have two presses we are adding in Suzhou. The first press we were able to expedite and we did get it online and approved in March 2015. We added that capacity and that press is primarily for the RO4000 product. That added about 10–15% more capacity globally; we also took our Belgium operation from six to seven days in lamination, and that added another 10%. Right now

we are at 25% more capacity than we had if you turn the clock back six months ago.

The other thing that has happened in the midst of this 18-month journey is the acquisition of Arlon, and what came with that purchase are not just the different sets of products and customers, but also some available capacity. In the Arlon factories we are presently looking at the individual types of machinery, what products are run there, and we are identifying what capacity we can extract out of the factory to possibly run Rogers' legacy products. We are going through that analysis now and we are positioned very well for the next wave of increased demand.

We've been able to bring our lead times down significantly, although I think the roughest period was when we had to take our lead times up to 55 business days on RO4000 materials. That probably caused the most angst in the customer base. I'm glad to report we have done two lead time reductions since late March.

We've also brought lead times down on RO3000 materials as well.

In addition to the lead time reductions, we are creating some strategic stocking programs at the master sheet level so that when we do get a customer order on those parts we can turn the order in less than five working days. I think we have a pretty solid plan going forward on all product lines. The entire period of the last 12 months we went through was very demanding for everybody; it was seen but not expected to come that early and so we were unfortunately behind the demand wave. It's like a guy in the ocean who is going to ride the wave; it just so happened the wave came sooner than we ex-

“  
**We've been able to bring our lead times down significantly, although I think the roughest period was when we had to take our lead times up to 55 business days on RO4000 materials. That probably caused the most angst in the customer base. I'm glad to report we have done two lead time reductions since late March.**  
 ”

**AN UPDATE ON THE ROGERS MATERIAL SUPPLY LINE** *continues*

pected so we had to do a course correction.

We are in very good shape now. Our goal is to get all of our lead times down to industry parity or better before the end of the year, and we are working our way down that glide path right now.

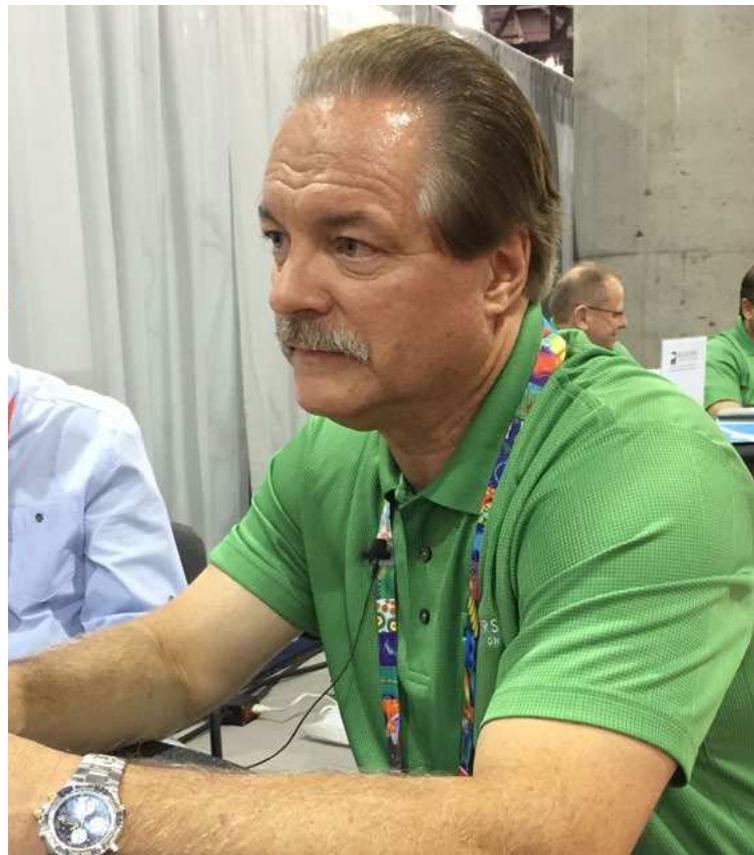
When looking at lead time, we want to be as good as anybody else in industry. So if the best in class is five days in a certain product line, we want to be at five days. If the best in class is 15 days, we want to be at least as good as them at 15 days. We want to be on parity when our customers want to place an order for Rogers' material versus a competitor; they know they can get it in at least the same time frame.

That's probably been the biggest source of irritation for our customers, when we had to balloon out the lead times, but at the time there was no other apparent solution that was quick. We had to create a little bit of breathing room so that we could try to get as much internal capacity turned around as we could. Overall, our team did a great job with that and with managing the customers through some difficult situations. The positive side you can make from the customer's view, we didn't really impact any customer that significantly. We didn't shut anybody down; we didn't create havoc at an OEM or anything like that. We were able to stay ahead of that, but it was not without pain.

**Matties:** *I don't know that you can say that with certainty, though, because maybe the major OEMs were allocated for, but perhaps not all customers.*

**Pavlak:** Right, for some of the customers there were bumps along the road. We put a new expedite process in and that expedite process didn't handle the smaller orders, so we created an escalation process; if they had a really critical order, we got it in the escalation process and gave them an answer within two to three days for how quickly we could pull it in. We did some displacements to try to help them through that period. With many customers, we didn't affect any big programs out there...

**Matties:** *Where the rocket ship didn't launch.*



**Pavlak:** Exactly. It's been an interesting journey for everybody. It's unfortunate that the capacity that we had planned didn't come on line sooner, but some of those projects you can't make go any faster without sacrificing something else. We did pay expedite cost for those capital expansion projects to try to bring them on faster, but I think the global operations team did a really good job of driving more internal improvements to make up much of the difference between demand and capacity.

**Matties:** *That's what is really interesting: your internal process improvement strategy and the increased performance that you found. However, this is just good business practice in any case, whether you are on time or trying to catch up, to find best practices to try reduce waste and improve yields.*

**Pavlak:** What it did was heighten the need to accelerate things that were already in progress. We really put a big effort on that to make sure that was number one in the operations playbook for

## AN UPDATE ON THE ROGERS MATERIAL SUPPLY LINE *continues*

everybody who was an engineer or technician. It is good business practice but it was like DEFCON 4, the highest sense of urgency. This was on top of everyone's list—no matter what you did when you come in today, here are the top two or three things you need to work on. We really stressed that mindset every week making sure we were focused on all the right things.

There are a lot of common challenges that happen in our industry that you have to overcome. You have to make sure all your suppliers are ready to go. There were some issues with copper availability for a short period of time, and we had a lot of pressure on our copper suppliers to deliver copper. We weren't the only ones suffering from copper shortages; it was across the industry—you mentioned some names earlier of other laminate suppliers having the same problems. We had to press that supply base really hard, too. In Q3 of last year, copper was probably at the tightest with supply it has been in recent times. Now we have some additional sources of copper for our materials, so we have flexibility that we didn't have before. From a raw materials standpoint, we are in really good shape going forward. It did press us into making some pretty tough decisions with some suppliers, as far as getting them moving with us in support of our customers.

**Matties:** *You have your own supply lines issues.*

**Pavlak:** The focus was from the suppliers all the way through the factories. We started at the factory level and said, "Let's look at what we can control and what we can push," and then we worked our way up to the supply base and made sure that we were good there.

We also introduced a slightly different concept into the operation called SMART planning. It's a rigorous S&OP process and we were able to utilize that process to drive more output through the plant without sacrificing qual-

ity. We took a much finer and granular look at our demand and who it's for and when it was needed, so we peeled back the onion on a lot of things and started looking at the demand data more closely to make sure we are taking care of our customers in a balanced manner.

“  
**The focus was from the suppliers all the way through the factories. We started at the factory level and said, “Let's look at what we can control and what we can push,” and then we worked our way up to the supply base and made sure that we were good there.**

This improved S&OP process has created more rigor in our global operation—in how we plan, how we execute the production schedule—and that rigor is still there and improving every monthly planning cycle. It took us internally to another level of performance on how we work with our plants in the different regions, how we look at customer demand, prioritizing orders, and things of that nature. We have a lot better system now than we did before.

”  
**Matties:** *Your strategy has really been reaching into the OEM and getting spec'd at that level, not necessarily focused on selling to circuit fabricators, per se. It sounds like once these OEMs have spec'd you in, they don't want to go through another process of bringing in somebody else to replace it. They've been pretty patient with the delays and the delivery times.*

**Pavlak:** Actually, we have been working very closely with both OEMs and fabricators in selecting the best materials for particular applications and then supplying to them timely through our global manufacturing and supply chain network. Yes, our customers including OEMs and fabricators are very patient with us, but primarily because we have been working very closely with them on material selection, technical support, new products promotion, and various measures we have taken to improve the supply situation. I think the fact that we are spec'd in helped us through that period of time, and we spent a lot of time with those customers and the fabricators to make sure they understood that there was an end to this and we have an aggressive plan coming to fruition;

## AN UPDATE ON THE ROGERS MATERIAL SUPPLY LINE *continues*

just stick with us for a few more months. They didn't walk away and a lot of that is based on trust that we were telling them the truth and they understood what we were doing.

We did a lot of communication with the fabricators and a lot of communication with the OEMs to make sure that they understood there was a plan to get out of this; we laid out a rough timeline so they knew when the additional capacity would be available. Every time we made a milestone in that plan, we did our best to communicate to key fabricators and the OEMs that we made this milestone and here is where we are now on output. We made sure that they were connected with us. We did not want to leave them hanging out there, so we put a lot of work into the communication with the customers.

Another key point with the demand being so high was making sure that the demand we were receiving was real, and to make sure there was no over-buying going on by somebody. So we had checks and balances built in between what the fabricators were ordering and what the OEMs' volumes were, which we call the "zero schedule," and we made sure that we had the right allocations set based on the OEMs feedback.

Communication was the key through all of it. We had to stay tight with both the fabricator and OEM to make sure that everybody was singing out of the same book, and that allowed us to get through the period. We feel we came through it okay, only the customers can tell you how they feel about it, but from our perspective we thought we did a good job of managing through this tough period with them.

**Matties:** *Right, so now you started with the lead times over 55 days, and what are you currently at?*

**Pavlak:** All RO4000 laminates had peaked at 55 days. We were in that for over six months and

then we reduced it to 45 days a month ago. Recently we reduced it to 35 and we have plans to get it down under 15 days by the beginning of Q4. Actually, we are ahead of that schedule right now, based on what we are seeing. We think we can get there quicker, so we are making a big drive to bring down the lead times.

**Matties:** *The message then to the industry is, "We're almost there."*

**Pavlak:** Yes, we're almost there. There is another planned RO4000 lead time reduction for early Q3.

**Matties:** *You'll be on par with pretty much everyone else by Q4?*

“  
Every time we made  
a milestone in that plan,  
we did our best to  
communicate to key  
fabricators and the  
OEMs that we made this  
milestone and here is  
where we are now on  
output. We made sure  
that they were  
connected with us.”

**Pavlak:** Yes, and the new capacity we are putting in, all the new equipment, is designed to take us out to the next three years of demand as we see it. We stepped up lamination, we stepped up the pre-preg production for RO4000 lamination and we are also bringing on a brand new coating line in Arizona for the RO3000 product line that is being released for an OEM application at the end of June. That new line is going to give us 100% more capacity on dielectric paper for RO3000 materials. Now we'll be discussing the next wave of capacity we want to put in place, when and where.

**Matties:** *You don't want to find yourselves in the same position six months down the road.*

**Pavlak:** Exactly. We are going through another market evaluation cycle in the next couple of months, saying, "Where is the next capacity we need to be at, at what location on the globe, and what product lines do we need to provide additional capacity?" We are also taking a look at the former Arlon products, understanding

**AN UPDATE ON THE ROGERS MATERIAL SUPPLY LINE** *continues*

that we are past the due diligence phase with the purchase and now we are into the integration phase. We are trying to understand what capacity we can squeeze out of the former Arlon plants to help with the overall future demands.

**Matties:** *Was the acquisition of Arlon capacity-driven or was it market-driven?*

**Pavlak:** It was really primarily market-driven. It got Rogers into markets that we weren't into before. One of the strengths of Arlon is that they are a very strong player in the antenna market. The acquisition brought some new customers to us. It also provided some new product breadth and feel that this is a growth area, therefore it was more of a market-driven acquisition. Some additional operational capacity also came along with the acquisition. I call it "the pants come with the suit." The factory in Suzhou has some open floor space for additional presses and a coating line providing some additional benefits for our operations with the acquisition.

The nice part about the Arlon acquisition is we now have two plants in Suzhou; from one plant to the other is about a 45-minute drive. We call the locations Suzhou East and Suzhou West. We have the opportunity to really leverage the fact that it's in the same city and not that far apart. We can leverage the expertise across the locations and we can look at the capacity across locations. I think that because of the short distance between locations there is a synergy there that's going to help us in our China market.

**Matties:** *And China is a booming market.*

**Pavlak:** Yes, a majority of our global laminate sales goes to the Asia region.

**Matties:** *Arlon did a phenomenal job in China when the markets were dropping and China brought on 3G; it was just a great time for them.*

**Pavlak:** They had a very strong year in 2014 as well. Of course, you always get into a lot of discussions when you are purchasing a company

and it's all about "what can you do for us right now?" The Arlon acquisition has been very good for Rogers and for Arlon. The former Arlon employees are very positive about the fact that Rogers bought them. They were part of a private equity group for a period of time and one of the comments I've heard from several people is, "I'm glad that somebody in the industry bought us who understands our wants and needs and what we need to do in the plant to improve." I think everything I've seen so far has been extremely positive from that standpoint. To my knowledge there is nobody in Arlon upset about the acquisition; I think they're actually relieved that it's over and it was acquired within the industry.

**Matties:** *John, thanks for sitting down with me today.* PCB

#### *About John Pavlak*

**John Pavlak** started in 1979 with General Motors in the Packard Electric Division and worked for General Motors in Delphi for more than a quarter-century. Starting out as a product design engineer, Pavlak then became a senior reliability engineer, quality manager, and eventually worked his way through many operational assignments. He ran two plants for General Motors/Delphi in Ohio before moving to Alabama, where he worked for eight years and again managed two plants, capping off more than 26 years with GM/Delphi. After leaving General Motors/Delphi, Pavlak went to Lennox HVAC, which provided a change of pace away from the automotive industry, and into the manufacturing of commercial rooftop air conditioning units. For two years he ran their HVAC commercial product factory in Stuttgart, Arkansas, and then accepted an opportunity with Stoneridge Electronics, based in Juarez, Mexico. After running their global factories for wiring harnesses and electronics manufacturing for more than six years, in mid-2013, John joined Rogers Corporation, where he now serves as the director of global operations.