



Advanced Manufacturing Now

Targeting the Skills Gap in Forming and Fabricating

(Part one of a two part series by SME Podcasts)

Host: Alan Rooks, Editor in Chief, Manufacturing Engineering

Guest: Robert Tessier, National Director of Advanced Fabrication Technologies for Airgas, an Air Liquide company

As in other industries, U.S. forming and fabricating companies are experiencing a critical shortage of skilled labor. In this SME Media podcast, Alan Rooks, Editor in Chief of Manufacturing Engineering magazine, talks with Robert Tessier, National Director of Advanced Fabrication Technologies for Airgas about the skills gap in the forming and fabricating industry; changes needed in the education system to fill the need for skilled labor; how automation factors into efforts to reduce the skills gap; and efforts at Airgas to develop workers for manufacturing operations, including a special program for military veterans.

Intro:

Aerospace and defense manufacturing. Machines and automation. Additive manufacturing. Smart manufacturing. Global manufacturing economy.

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Alan Rooks:

Welcome to another SME media podcast. Today's podcast is sponsored by Rex-Cut Abrasives, which provides high-performance products that help aerospace, automotive, and medical manufacturers minimize metal finishing steps and maximize production. Discover how you can improve your daily grind at rexcut.com. I'd like to thank our listeners for joining us on this episode of Advanced Manufacturing Now, the podcast for manufacturing professionals. I'm your host, Alan Rooks, editor-in-chief of Manufacturing Engineering Magazine.



Alan Rooks:

We're joined today by Robert Tessier, national director of advanced fabrication technologies for Airgas. Rob, welcome to the show.

Robert Tessier:

Well, thank you, Alan. I'm glad to be here.

Alan Rooks:

Well, terrific. We're glad to have you. Well, to start out with, Rob, first tell us a little bit about Airgas and its role in the North American manufacturing market.

Robert Tessier:

Airgas is an Air Liquide company. We're a leading supplier of industrial, medical, and specialty gases as well as hard goods and equipment and related safety products. Our company, basically we're dedicated to improving the performance of over our one million some odd customers. And, basically, we've got over 18,000 associates, we've got over 1,400 locations, we've got a big, robust e-business platform. And, basically, for myself, I oversee the advanced fabrication grouping. With that, I'm responsible for welding applications, automation, automation service, and our Unlocking the Hidden Cost of Welding program. Our role, I mean, in advanced fabrication is basically to help manufacturing develop quality standards and drive cost reductions. So we're not really involved with the sale of, we're really involved with making sure that whatever people buy or use, they use it effectively and really maximize their uses.

Alan Rooks:

Well, great. That makes sense. So we're going to be talking about the skills gap today. So we'll start with a broad question, which is how would you characterize the skills gap today in the forming and fabricating industry?

Robert Tessier:

Well, in our industry, I think we're in trouble. You look at the average age of the individual that's in this industry, it's over 55, 57 years old. And, unfortunately, this industry is basically male dominated. We have multiple issues in that area. I mean, our current projections show that by 2025, we'll be short almost half a million people in the fabrication industry. And when you start looking at manufacturing, manufacturing accounts for approximately 40% of the workforce here in the United States, and construction accounts for about 20% of the workforce. All in, in that's more than half of the workforce in the country.

Robert Tessier:

We're seeing a pretty large gap between basically the boomers and millennials. And a lot of people really haven't been brought into this particular industry. What it comes down to is I think the industrial trades as a whole have been given a pretty bad rap. Everyone believes that this is a



dirty job, it's hot, it's miserable, it's for the undereducated. It's just not necessarily exactly where this industry is and what's going on. What's going to make this even more of a problem is we start looking at onshoring, we start looking at some vertical integration, and our problems are going to start becoming significantly more visible.

Robert Tessier:

I mean, although there happens to be a great need for more people in industry, the doors have opened up very slowly for women, for minorities and seems to be still a massive issue. We're just not addressing the fact that there's a lot of intelligent people that can add basically to our needs as a country and really start taking care of their families and have really good careers. This is just not being addressed. We're just not looking at all the avenues that we can look at to really solve our skills gap.

Alan Rooks:

Yeah, it sounds like a really multifaceted issue, particularly on the image side, that's been talked about forever. But it seems like there is some progress, at least from my perspective, that people are at least aware of this, and they're doing more to try to open themselves up. Do you find that true?

Robert Tessier:

Well, I do find it true. We're starting to see people in industry starting to get involved with some of these situations. If we want to take control of our destiny, people in industry are going to have to take a look at this. There are women that are getting involved. I mean, it's starting to become a lot more popular on channels like YouTube, where you see women in welding, which is absolutely fantastic, and you start realizing that this isn't just a horrible job. You see some of the applications, and, truthfully, the environments are very reasonable. So there are things that are starting to change. It's coming slowly. We need to increase the speed.

Alan Rooks:

Absolutely. So that brings us to our next question, which is where does the education system fit with filling the need for skilled labor?

Robert Tessier:

Alan, that's a pretty complex situation. We've got a systemic problem here with education here in the United States in as much as we're completely underfunded. And, truthfully, I mean, the education system as itself isn't really promoting industrial trades. You look at school counselors and educational advisers really pushing people to go to college, which is absolutely fantastic, but they're missing what the country is really looking for. It's just not only that. Our educational systems, as far as teachers, we're in short supply. The same issue that we have with industry itself is that most of the educators, again, are getting to that point where they're looking at retirement. We have a lot of companies that are just looking at and relying on tribal knowledge,



and not that that's wrong. It's just that there isn't enough formal education that's really being put into some specific areas, whereas a person who's learning from a person who learns from another person, and each one of them remembers 50% of what they were taught.

Alan Rooks:

Yeah, right.

Robert Tessier:

And the tribal knowledge is starting to really just weaken what's going on and, truthfully, the need for a better educational system. For us, I'd say that industry has to get more involved. We have to start laying out that there is a valuable career path for everyone in this business, and if industry does get involved, we need to start understanding what support looks like. How to supply steel, how to help people with time, how to help them with money. So to run an industrial program at a school, it requires an awful lot of money. It's very different than a computer course or a CAD program course.

Robert Tessier:

Whereas you're buying several laptops, you're buying several computers that have a pretty good lifespan, in the industrial trades, especially in welding, you have to think about it. You go through metal, and that's a daily function. You go through wires, you go through gas, you go through PPE. All these things are happening on a daily basis, and these are things that need to be supplied to the individual students. And without industry trying to support this, the education system really can't stomach it. They don't have the money, and they don't have the backing. And, truthfully, we have this roadblock sitting right in front of us. We as an industry have to take control of our own needs.

Alan Rooks:

Yeah, absolutely. It seems that anecdotally at least, the stories I've read that been successful is where companies really get involved at both the high school level and also at the community college level, where they are serving on advisory boards and helping to support equipment purchases, things like that. Is that what you're talking about?

Robert Tessier:

That's exactly what I'm talking about. The cost of the equipment, the cost of supplies is really almost too difficult for anybody to deal with. And you look at local educational facilities, whether they're high school programs or whether they're junior colleges, there are some tremendous programs out there but typically with industry support. The local industry is supporting those programs, basically donating to them and, truthfully, sitting on those particular houses and helping them understand or getting an understanding of what they need, why they need it, and how to supplement those needs.



Alan Rooks:

Yeah, it's terrific. We need a lot more of that, but it is refreshing to at least read about some success stories that are out there.

Robert Tessier:

I agree.

Alan Rooks:

So, another way of looking at the skills gap is automation. In your view, how does automation factor into efforts to reduce the skills gap?

Robert Tessier:

That's a great question. Technology can be a large part of the answer, and a lot of people steer away from it. They're afraid of what they don't know. The thing about it is, is that technology and automation can be the answer to help people get from where they are to where they want to go. It's like our costs to produce per hour are higher than most of our international competitors. We have to start understanding how our quality standards and how we can create quality standards to going ahead and compete in these markets so that we're using more of our intelligence and less of our backs like with Ford. Automation to most people spells robotics, and that's a fallacy. Automation really fits into several categories. There's robotics, which is flexible automation, there's fixed automation, and then there is cutting and cutting applications within it.

Robert Tessier:

And within cutting, you'll have plasma, you'll have oxyfuel, you'll have laser. I mean, there are multiple areas, and each one of them have software that you have to understand and basically certain other skills. Automation doesn't mean job elimination. The truth of the matter is, is that it's going to create a lot more jobs, and we have to look at how people evolve and how industry is evolving. Today we need to be training people for jobs that we don't even know exist yet, and automation is going to be a path to that. I mean, when you look at automation as it is, and you start looking at a younger generation that we need to bring in, it starts to get pretty exciting.

Robert Tessier:

I mean, you look at people in school today, or younger kids, my grandchildren and my sons, they're very big into video games. They have very good computer skills. They've got a completely different skillset than basically that I went to school for, or basically that I carry. Incorporating their skillset and really allowing them to do what they're very good at and incorporating that into what I've done and understanding welding and understanding productivity and understanding manufacturing. If you merge these two thought processes, we start really becoming very, very, very good. And, truthfully, then allowing us to increase our productivity and throughput. With



that, we start lowering our costs, and, really, what's the ultimate goal to manufacturing? It's to go on ahead and be productive, to have lower costs, to have a high-quality product.

Robert Tessier:

Well, we can achieve all these things through automation. It's just a matter of understanding what our inputs need to look like and what our outputs. So we have to clean up our whole system. We need better cutting systems. We need better welding systems. And at the end of it all, we still have to understand not every application can be handled through automation. There's still a lot of semiautomatic and manual applications that are going to be necessary. So the full skillset that we need is absolutely critical, but automation can and will be a large portion of our answer, as far as becoming productive and, truthfully, being able to onboard or basically onshore a lot of the products that we're thinking about bringing back home.

Alan Rooks:

Yeah, absolutely. I've heard it described to me to specifically say with automated welding operations is that you still need a really good welder, but instead of him or her doing the welding, they're going to be monitoring what the automated weldings are doing to make sure that's doing right, working with the software and that whole nine yards.

Robert Tessier:

I think it's absolutely critical. Not only that, you start seeing people that are getting away from some of the hazards in welding. And it's not to say that there aren't, but when you start thinking about smoke fume, and basically let's say the grimy part of what people have this perception of what welding or what industry is, automation is really put into those places. We're allowed to remove smoke fume from that area. We're allowed to start looking at air conditioned facilities. We're starting to look at a lot of ways that automation can really bring manufacturing into our century. And no longer we'll be looking at the 1950s, 1960s, and 1970s way of doing things, but, in fact, we just take a step forward. And I think it's absolutely critical. It does take a different skillset, and this is exactly what we've been looking at and what we need from the younger people that are coming into the business.

Robert Tessier:

They need to go on ahead and sit with an individual like me that can explain to them welding application from our perspective. And then they can apply everything that we know and really bring it into a motion device. They carry those skills, we have these skills. Sharing those skills is going to be absolutely critical to be successful moving forward.

Alan Rooks:

That's terrific. So what specifically is Airgas doing to support the industry regarding the skills gap?



Robert Tessier:

Alan, this is an area where I happen to be very proud to be working for the company I'm working for. We're really into it, and this comes from the CEO of the company on down. I mean, we're driving several programs. Right now, we have a high school welding initiative program, and this last year, we brought on 20 new schools, we've had seven renewals. Now what we're promoting at this point in time is helping people, and typically up to \$10,000 a year per school, going ahead and help them with supplies, gases, and basically everything that they would need going ahead and run their program.

Robert Tessier:

We're looking at a used equipment or refurbished equipment program where we can start supplying schools with equipment that students would see in industry, so no longer would they be looking at antiquated equipment that really is no longer being used, but we're taking equipment, we're trying to basically rebuild it, put it into schools, and help these particular schools going ahead and deliver people into the industry that really can produce.

Robert Tessier:

I mean, just recently, in fact, today, a gentleman by the name of Nick Graff at Dallas County Community College had his first graduation. I mean, and we support this program also. It's the Veterans Outreach Program. This particular program looks at veterans that have either run into problems, become homeless, or are looking for a new career path. They've gone on ahead, and they put together a complete welding program. And today was the first graduation of that specific class, which is fantastic. Now we're bringing people that have served their country, that have really paid the price and have come home to find out that there haven't been the open arms that they had anticipated, yet this is a program to help them get back on their feet.

Robert Tessier:

We also want a weld specialist apprentice program that teaches people about the engineering that surrounds welding. It's not just metallurgy, it's not just chemistry. I mean, there's physics. You have to have a pretty strong mathematical background. We're bringing people from the bottom to the top and, truthfully, putting together a career path so that younger people than myself know how to get my job. It's not a matter of just always saying, "What do I got to do to get a raise?" You got to show people these are the educational requirements, these are the requirements that you have to do physically. It has to be completely objective. It can't be subjective. You can't guess. You have to know what you have to do.

Alan Rooks:

Right.

Robert Tessier:

We've developed an unlocking program which educates our customers on quality standards and



basically how to develop these particular programs. We're involved with SkillsUSA and multiple ag programs across the country, as far as inspectors, as far as teachers, as far as helping fund these particular programs. I mean, we're also using our unlocking program to educate welding instructors. I mean, last year, we did it in two different locations, and we were hoping to expand it pretty much this year. And 50% of the people that showed up were female, which was really fantastic. I mean, we're working with some of the collegiate programs. We're out there, and we are trying to promote this program, but we're trying to put our money where our mouth is. And, honestly, it feels good. It really does.

Alan Rooks:

Well, that's a great program with a lot of moving parts, and I particularly commend you for that veterans program. That sounds like a terrific initiative.

Robert Tessier:

Well, it's a bit personal. I'm a disabled veteran myself, and my son basically was 82nd Airborne. He's 90% disabled. I mean, we believe in supporting our own. So, I mean, it's just like there's a lot there. Veterans have a lot to give. People really need to look at veterans, people that are getting out of the service, people that have served their country. They're typically dedicated. They understand how to follow rules, they understand how to get things done, and they just need a break.

Alan Rooks:

Absolutely. Well, thanks again for doing that. Well, Rob, thanks for your insights and for taking the time to join us today. If our listeners want more information about Airgas, where should they go for information?

Robert Tessier:

Well, there's a couple things that I'd ask people to do. And, truthfully, I've got an 800 number if they want to speak to somebody. I mean, it's (800) 909-8058. I mean, you could visit any one of our 1,400 local locations, or you could email us at info@airgas.com. And, truthfully, any question. Any question. I mean, we're prepared to answer anything or help in any way that we can.

Alan Rooks:

Well, that's great. Well, thank you, Rob.

Robert Tessier:

Well, thanks, Alan. I appreciate you having us on today and letting us share some of this with you.



Alan Rooks:

You bet. And for our listeners, I'd like to point out this is part one of a two-part series of podcasts with Rob focusing on staffing in the forming and fabricating industry. Part two focuses on the impact of COVID-19 on staffing and recruitment and can be accessed at www.sme.org/smemedia/podcasts. And thanks to everyone for joining us today.

Outro:

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