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STEFANIE BRICKEWEDE – PART 1

Todd Grimm [00:00:05]

Welcome to layered the business of additive manufacturing. Sponsored by Xerox. I'm Todd Grimm, a 31 year veteran in the additive manufacturing industry. The future of additive manufacturing is promising and exciting yet many challenges lie ahead. Our goal is to be your source for reliable information, backed by data and presented by the experts. We address some of the major issues manufacturers are facing with added manufacturing solutions and how they are approaching adoption of AM technology in their own workflows and industries. Through conversations with industry experts, we will discuss the complexity of offerings, technology compatibility and best practices and integration, among other topics. We're here to navigate with you these big questions as we talk about the business of additive manufacturing. In this episode, the industry focus is transportation and more specifically rail, and the conversation will put an emphasis on maintenance in the context of producing spares or replacements. My guest is Stephanie Brickwede managing director of MGA, which I will ask her to describe. So Stephanie, welcome to the show and thank you so much for joining us today.

Stephanie Brickwede [00:01:17]

Thank you very much. Thanks for having me. And I'm really looking forward to our talk.

Todd Grimm [00:01:24]

This is about rail or transportation in general, but rail and heavy on spare parts. But I don't think many people are going to understand or know what MGA is about and why it exists. So would you please take a few minutes to describe MGA what you're trying to do, who you're serving and the big question of why?

Stephanie Brickwede [00:01:44]

Yeah. So I have two jobs. First of all, I'm responsible for additive manufacturing within Deutsche Bahn. That's the German railway company. And when we started with additive manufacturing in the corporate six years ago, we were looking for an existing network and we didn't find an appropriate one. So we were looking for an opportunity to get into an exchange with the companies who already started with

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additive manufacturing and to talk about subjects and especially experiences they already had. And we didn't want to undergo the same learning curve and we wanted to shorten that. And that is that was the reason why we were looking for an exchange with other companies and the network associations helping. Yeah. So five years ago, we founded MGA, which stands for Mobility Goes Additive and with nine founding members, and meanwhile, we are 130 who cover the whole supply chain and additive manufacturing, like machine producers, material providers as well as printing service bureaus, universities, consultancies and, of course, a couple of software companies. And we need a lot of users in the network, too. And this is really interesting to bridge the gap between users and corporates and companies to provide different services and additive manufacturing.

Todd Grimm [00:03:24]

DB is a founding member of MGA. Deutsche Bahn is a founding member. And you've been in its existence for five years. So where Deutsche Bahn is now, what it's learned, what it's achieved, what it's doing in additive. Does it intend to stay within the network? And more important, I'm guessing the answer is yes. But more importantly, why? You know, what information or resources do they still need out of MGA after five years?

Stefanie Brickewede [00:03:53]

First, I must explain the Deutsche Bahn is not a construction company, so we have just been a maintainer and operator of trains. And this is why this is right from the beginning. The printing of spare parts, you know, so we didn't need so many prototypes where the technology comes from. So we focused on spare parts. And then we have to cover a huge range of challenges and use cases from trains to infrastructure and also stations. So we decided not to buy industrial machines, but we rely on printing service bureaus and for us, it's more important to match the use case with the perfect technology in additive manufacturing, as well as the provider who can offer us those parts and the needed quality. And when we started with additive manufacturing, the first parts we printed were like little plastic parts. It was in fact a hook hanger. And meanwhile, we've also covered a broad range of safety relevant parts. Also printed from metal. And yeah, that was quite a journey.

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Todd Grimm [00:05:18]

What? I didn't realize that it's supporting trains infrastructure and stations. So in the in the context of spares, I want to get to how significant is additive manufacturing in general, polymers and metals, but also specifically metals for DB and those like DB.

Stefanie Brickewede [00:05:36]

Yeah. So usually we buy trains and we get the spare parts from our suppliers for approximately 15 years and after 15 years, those suppliers say, now we are out, please help yourself put everything in stock you might need. And yes, sometimes we are lucky, but sometimes you really have the problem that we need spare parts. We can get the markets anymore. And so this is the moment when additive manufacturing comes in. With additive manufacturing, we're capable to enhance the lifecycle of trains, of infrastructure, of everything which has to do with railways. And so that really helps us to provide spare parts and keep trains running. Just to give you an example, some time ago, we printed wheel bearing caps. And that is the safety relevant part, it's quite a heavy one. And with that, we helped to prevent the standstill of locomotives. And also, we printed other parts for high speed trains, and those high speed trains go with 350 kilometers per hour, which is very fast. You would not imagine what might happen if something happens. So these are really safety relevant parts. And with that part, we prevented the standstill of the 13 million euro high speed train for more than nine months, and we reduced that time to five months, and that meant that we really saved tens of thousands of euros. And then it's not really important anymore that additive manufacturing usually is not a very cheap technology. So in the metals sector, often you have to pay 10 times of the cost, which originally occurred. Of course, this is still a hurdle for this technology, that the prices are still quite high and those have to come. But sometimes you really find great use cases, but it's not like you can find them everywhere and without any effort. And so this is one thing we have to think about in additive manufacturing.

Todd Grimm [00:08:08]

All right, I've got so many questions off of that simple, concise statement. So first off, you said you were doing nine months of downtime on this

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locomotive to five months. Now people think of additive manufacturing, specifically metal additive manufacturing as a way to we're rocking and rolling tomorrow. Why five months? What all had to occur before the spare? The replacement part was available and put on the tree.

Stefanie Brickewede [00:08:33]

There is a lot of certification. And this is one of the other hurdles we have to work on, because usually if you have safety relevant parts and those are, to be honest, the parts which prevent standstill of trains or infrastructure, then you have to think carefully about the certification process. And if we want to replace existing spare parts, we always have to fulfill the needs of this certification level. And those are very strict, which is good, of course, because we are talking about people related transport mode. And then we have to undergo and we have to prove that form, fit and function of that part is the same like the previous part. And then we get the certification. But if we want to really accelerate with printing parts and to do much, much more than we do today and just to give you an idea, on the last years, we printed more than twenty five thousand parts for rail, which means more than 300 different use cases from many, many different technologies and materials. If we want to accelerate the printing process and the number of parts, then we have to work on the certification processes. And I know that this technology is already 30 years old. But if you're talking about spare parts and the certification process, then you still have to solve a lot of questions and you need the certification and sanitization process, which we are working on the network. And maybe this also makes clear where Deutsch Bahn brings in some subjects into the network and in the network, we work on the hurdles which still do exist in cooperation in the joint approach.

Todd Grimm [00:10:33]

Is there any possibility or have you or is there any possibility to pull from what's being done in other industries regarding standards and certification, such as aerospace? Are there conversations going on between the rail side of MGA? And I believe you have at least a member or two that are in aerospace? Is there anything that can be pulled, pulled together and drawn together to expedite this development of processes and protocols and standards that we can now operate to, versus having to do it on our own every single time that we want to tackle a problem?

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Stefanie Brickewede [00:11:04]

Of course. And this is exactly why we founded the network and to learn from each other. But sometimes we really also have big differences. So concerning materials, for instance, we need in the railway sector a very high level of flame retardancy. And that is even higher than in the aviation sector, which is, yeah, really. So if you have landed a plane, it takes just 40 seconds to empty it and they have a standard of, I guess, 90 seconds. If you're in a train with hundreds of people, you might be in the tunnel. First, you have to drive out of the tunnel and you have to give your passengers the opportunity to get off the train, and that might take much, much longer time. So our standards are 12 minutes. And if you compare that, then you know that we have to use different materials and we have to fulfill different standards. And this is just one example out of many. So of course, on a global level, we can learn from each other and the overall logics are quite similar. But the details we have to figure out something specific for each and every sector.

Todd Grimm [00:12:24]

Are all your members operating in that kind of level that Deutsche Bahn is, or do you have some, they're six months old into the network and they're still going through the learning curve to get confidence on reliability, get confidence on putting parts in place for non-safety critical items. To get to that point where we're willing to put a wheel bearing that's 3D printed on a high-speed locomotive.

Stefanie Brickewede [00:12:44] So it makes a lot of sense to come together and to talk, very frankly. And this is really the nice thing about that network, about the different use cases and experiences with certain materials and technologies, and the others are also printing, and they also have a very broad range of paths they would like to cover. But if you get an inspiration for what is already possible, of course it's much easier, and if you go into train operating company, you usually have to fight against a lot of prejudices. Ah, 3D printing is just something for printing Star Wars figurines or for toys in general. And there it really helps, if you can point out that other companies are already working with that. And the good advantage is that the technology is so haptic so you can just give your colleagues something printed into their hands.

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Todd Grimm [00:13:48]

Oh, absolutely. And isn't it fun to see somebody who may be resistant or doubtful on our manufacturing to be presented with the tactile haptic input they're seeing and then get a talk to a competitor or colleague and see the light bulb go on? Isn't that a fun moment when you see the clouds part, the sun shines down on them and they get it and they become a convert? I just love that moment in time to watch it happen. Have you seen that, do you agree?

Stefanie Brickewede [00:14:18]

And this is what really makes me so enthusiastic about the whole technology because you can enlighten people and we are just at the very, very beginning of that technology. So the potential is so huge and Todd, you and me will have this feeling thousand times more in the upcoming years. And this is what it makes so much fun to work in additive manufacturing.