

Concrete Injection Made Easy

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#002 Decoding the PU based injection resins with Stephan Delarue from Webac

Mateusz Furs

I only use the foaming Polyurethane no matter what. It stops the water fast, so everybody likes it.

This is what I heard not so long time ago.

I suddenly remembered a story of a sales rep who had only been selling fast-reacting Polyurethane to one of his clients, a team of metro tunnel sealing workers.

But that was only a temporary waterproofing of course.

It made him sell the resin over and over again, because, you know, open pours of this material constantly got filled with water and started to leak again and again.

I'm sure that this episode will help you avoid these mistakes.

Hello, My name is Mateusz Furs, and I welcome you to the Concrete Injection Made Easy podcast.

Make sure you hit the subscribe button if you haven't already and sit back listening.

This is episode no 3. in which we will dive into details to decode the PU based injection resins.

I invited Stephan Delarue from Webac, Germany, to help me understand the complexity of this topic.

He is an expert in concrete injection. PU resins seem to have no secrets for him.

You will hear in a moment how many factors you need to take into consideration to solve a situation.

We compare fast-reacting resins with the long pot life ones.

Stefan tells exactly what pump and injection material to use to be able to stop fast-flowing water.

Ok, let's listen to this full of details conversation.

Please meet Stefan Delarue from Webac.

Mateusz Furs

Hello, Stefan, thanks for being here. Uh, today, uh, even though you're during your, holidays just after Easter. We are here to talk a little bit about PU based resins. How do you find this?

Stephan Delarue

It's a good idea. It's a good thing. Thanks. First for your invitation to be on the podcast with you today. So it is a good idea. Let's say to, uh, start a discussion about, polyurethane resins and cracks repair. And because there are a lot of, lot of systems, and options on the market. So it's good to let's say, to, to minimize it to some products and to give a good advice or let's say to give a direction about, all that correct injection, uh, problems around construction site and everything.

Mateusz Furs

Exactly. I see this matter from the two different points of view. First of all, I was a product manager for injections years ago at the moment I run, applicator company for seven and a half years. So these are two points of view from time to time. They are, uh, different, uh, many times they are different. But now as a contractor, uh, I take the full responsibility of, uh, my jobs being done. So, uh, I really need to know, how to choose the right resin for this given situation on the, on the job site. So this is this conversation that will be helpful for me and for other, contractors around the world to be able to choose the right resin. So let's discuss about this possibilities. What kind of resins, PU based resins do we have on the market in general?

Stephan Delarue

Yes. So, um, first we have, we have different, different types with different, options. I will start, let's say, uh, the first, uh, group of, of polyurethane resins on the market are the **foaming resins**, which means, they create foam, 20 times, 30 times, 40 times, or much more on free expansion.

Mateusz Furs

Okay. So that's great. I buy one kg of given the reason and I have 30 liters of one liter or even more later. So this is, this is great business for me.

Stephan Delarue

Yeah, it is a great business for you. But, I suggest, or let's say, uh, it will be helpful in let's say only a few situations, especially if you have to stop water where you need to fast reacting material where you need a foaming factor which would, should be higher than two or three times, but, for crack injection foaming resins are I would say not the first choice in that case.

Mateusz Furs

Okay. So you mentioned, one given type of the resin, which is foaming resin and now you say that it's not good for the, crack like a concrete crack injection. Why is that?

Stephan Delarue

It is, it is helpful for that. For example, the target should be, let's get, let's go. The target is, is your correct and you, there's water coming out, let's say, maybe under higher pressure. Therefore, these resins are designed, they are designed to, let's say, stop the water flow or the water pressure. And to make sure that with, uh, let's say rigid material with, with you, PU injection resin, uh, to penetrate into the crack fishers to will not get washed out. This is the first, uh, point, uh, let's say foaming a resin should be applied. If you have a water pressure, uh, let's say higher ingress of water in the cracks or in the structure, let's say that this,

Mateusz Furs

okay, so this kind of resin foaming resin allow me to stop the water and this is the first step

Stephan Delarue

To reduce, to reduce the water flow, to make sure that you are next step, that the crack, uh, injection with your next let's say, basement of polyurethane resin will stay inside and will not get washed out immediately.

Mateusz Furs

I see. Okay. Uh, frankly speaking, I cannot imagine a crack, um, that, uh, has so much water coming through it. It's like, it's very narrow. It's very small, so very limited amount of water can go through it in the certain given period of time. So I don't even use foaming resin, uh, into when, when considering eh, crack injection, I must admit that we use rather long pot life resin that are not foaming, not at all or almost not at all. Like, you know, we use, foaming resins for different kinds of applications, in this industry.

Stephan Delarue

Yeah, yeah, that's right. For example, foaming resins to say a final thing about foaming resin, they are mostly designed for, let's say for water stopping sheet pile walls, or wherever you, you have to stop a huge oil at a water amount on the higher pressure. It is not. So, uh, for correct repair, I give you the right for correct repair and you have to close it, or I have to stop, uh, the water, uh, penetration for inside the correct. It is better to use a polyurethane resin which has a lower viscosity, let's say a longer time, to react in contact with water and also, let's say a long pot life.

Mateusz Furs

Yeah. Okay. So we get this foaming, foaming, uh, and fast reacting, PU based resins. How do we use them? Like how do we mix it? How do we pump it? What kind of pump do we use? Can you explain a little bit on this?

Stephan Delarue

Okay. There are, there are two different, options you have with these products. You have on one hand you have the standard formulation. Let's say you have A and B component. Maybe you have also an accelerator which can be added to that. Uh, therefore you're, let's say you mix A and B together in the amount that you need. Most of these products are designed with a volume, with a mixing volume or let's say volume ratio of one part to one part, which may want to have A and one liter of B. Maybe you can add some accelerator on the A component to make it, to minimize the reaction time, which means let's say the standard reaction time is 20 seconds. If you need it faster add an accelerator to make it down to 10 seconds or less, these can be, um, the advantage of this product is it can be applied with a two component pump or a one component pump. The material reacts only with water, which means if you mix it and you feel it in your hopper of your one component pump, it can stay there.

Mateusz Furs

For how long? You know, I'm always afraid of leaving a resin in the pump and going somewhere else. Like, you know, we won't go to have lunch during the injection job. So how long can we keep the resin that is already mixed in the hopper of the injection pump?

Stephan Delarue

It depends on [resin's] pot life. That's what you know for sure. But, uh, for example, if you use the polyurethane foam resin, you won't stop. You will stop the water, then it will not be, let's say, so long in the pump, you mix it in the pump and inject it. This is the point that you, um, work with that maybe do it in steps to see the reactions during the injection with that material, but it can stay, let's say, uh, let's say 50 minutes, 20 minutes inside the pump, uh, to make sure that you, um, that you have lot of, that you have enough time to apply it. Uh, with one component pump, you can use also the two component pump which delivers A and B in several, in separate lines to your mixing head and will be mixed in a mixing hat. Uh, let's say in front of the packer. Then you have more time because you have no resin active resin inside your injection lines or injection pumps.

Mateusz Furs

So I like it very much because the reaction starts right before the packer in the pump 15 or 20 minutes ago, but right there just before it is being injected. So I like it. I like the solution, uh, very much, but it works only for, as you mentioned, uh, resins that are being mixed one to one ratio and nothing else can be applied because like there are some resins that they're mixing ratio is one to two or even one to three, uh, in volume. So it's not possible to use 2K pump for such resins. Yeah,

Stephan Delarue

It makes it also easier, especially if you have to calculate your accelerator to that. That makes it easier. You have your, it's easy to apply onsite if you have a mixing ratio, one parts to one part on volume and also, for example, um, one final thing, uh, I use two component pumps. For example, two combo pole pumps in a combination with a polyurethane foaming ratio, a resin. If I have to stop, let's say the huge or bigger water amounts to come home pumps have the option or I have to, uh, their pluses. Um, you have the higher amount of resin which you can inject in a shorter time. This is necessary if you work with a foaming ratio foaming resin because there you need let's say more amount of resin to stop it immediately. This is not, uh, like you want to do it in a, in a standard correct group here. There you need let's say a slower version, a more pot, a life to penetrate deeper into the structure.

Mateusz Furs

As we said when we inject the resident, I mean how much resident can be necessary to feel the tiny crack that's there. There is no volume, almost no volume inside the crack so you don't need so much resin. And that is why I like to mix at most, 200 milliliters A and 200 milliliters of B, which combined gives you even less than half a liter of ready mixed, uh, resonate, which is very little comparing to what we need to stop the water when we are stopping the water with, uh, how I foaming a resonance we need...

Stephan Delarue

...more material. Maybe a two component pump to deliver much more resin, other types of Packers, for example, with a higher, uh, inner diameter with bigger where you can push much more material instead of a standard small injection, crack injection packer. So these are completely different situations.

Mateusz Furs

Absolutely. Okay. So, can you tell us like if you are the one who makes a decision, when exactly would you use 2K pump to stop the water. And when would you stay with the 1K. Like what are these, you know, what to take into consideration to choose it?

Stephan Delarue

Yeah. For example, if you, if you have to, like we discussed, if you have to, I would use a two component, one component pump, sorry for, for the standard crack repair. That's not necessary to because they are, you know, you'd have a less amount of resin which is necessary to fill the crack. Uh, we have different packers if I have to go outside behind the structure, maybe to stop there, the water to plug there, water ingress or let's say to, yeah, to stabilize the soil outside. Therefore I suggest to use a two component pump. Because there, I know if I go, if I do the analysis first on side then I know, okay we have to go behind the structure, we need much more material, we need, we need much more pressure or let's say a higher amount of the material

Mateusz Furs

and foster reacting resin.

Stephan Delarue

Yes, faster reacting resin, all that stuff. Then I use a two component on it is that let's say from 20% or 10%, I use a two component pump, 90%, uh, can be done with one component pump. And there you have also different types of pumps cause you know you have piston pumps, they're one component pistol pumps, one component diaphragm pumps. So they have different options also.

Mateusz Furs

Exactly, uh, I remember, uh, when I was starting my business in 2013, my idea for getting a to control con to component piston pump was like in two years from the day I was starting. But

then two big projects came and I was like to give it to someone else or to get a pump and do it by myself. So, uh, I bought 2K pump in my sixth month of a new business and I wasn't waiting for another two years to come to, to get it. So, uh, and I must say that this two projects, uh, allow me to earn money for that pump fast. It was really so much faster than, uh, you know, working on the regular basis with the one component pump. So this is another advantage of having 2K pump that, you can, uh, you know, stop the water. Uh, you can really solve the huge problem on the side and you are getting paid for for it, uh, much more than regular injection. Yeah. I think that this is, this kind of situation is also, you can, you can see it also in Germany. Am I right? Or?

Stephan Delarue

yes. Yes. So finally, finally the two component, I liked them also back them. If we have to, let's say, inject a higher amount. For me it is, it is also let's say, much more difficult to work with that kind of pump or these type of pumps. Um, if you need a lower pressure for example, or especially in direct repair, um, it's not necessary to, to, to use, uh, let's say a 50 liters or 10 liters per minute to inject into that, uh, uh, crack. It is on the other hand, for sheet pile walls I explained to you for to stop water, then it's necessary to, to use it, um, or to do curtain injection with a two component piston pump. It is completely different to do the crack repair to the standard crack repair, uh, which we can, uh, where we can use one component piston pump or one component diaphragm pumps. Um,

Mateusz Furs

Exactly. As far as I remember as far as I remember one component, this regular, as you mentioned, almost 90% of job sites, uh, needed, equipment, uh, can give you at most around four liters per minute for like taking a crack injection is still way too much. You don't need that much amount of resin per one minute, four liters. That's, that's too much. Like it takes, uh, almost half an hour to inject one meter because you need to be patient. You need to slowly adjust the, the pressure on the pump and to observe the consumption of the resin in the hooper. There is in the hooper and that is why I love my hoopers made of plastic PET bottles because it allows you to really notice the difference in the level of the resin. So yeah. And it forces my employees to make very little amount of resonance at the same time. Uh, so I'm not losing money with not used and you know, thrown away, resin on the job site. Let's talk a little bit about, uh, one special, uh, PU based resin that is only one component, not only being pumped with the one component pump, but one component. How does it work and when we can use this kind of resin.

Stephan Delarue

Okay. Look, one component, resins, they are, let's say they are also foaming resins. They are designed for let's say for easy application. That's the background maybe for that and to react or to react on site really fast. But these resins, they react only with it is one component resin, which means we have not the B component or whatever second component or your B component will be the water.

Mateusz Furs

The whether that is just, you know, we're trying to stop.

Stephan Delarue

Yes, yes. So, um, but uh, therefore they are designed to get in contact with the water and to react. Um, it will be the application can be done also, let's say if you have a water stopping sheet pile walls uh, on, on, on sites, uh, underground, uh, sites where you have let's say a joint, uh, huge, uh, bigger joint which has leaking. They are there, you can use them because they will react if it comes in contact with water. Um, if they, if they will be not water present or let's say after the first contact, uh, your next material will, which will be injected, uh, behind your first

shot. Um, it will, maybe it will be not, find any water and it will be not reacting. This is the point, this is the main point, uh, which should be, let's say, explain to the clients, look and stop water. But if there's not water there or if the water is not present, it will be not reacting.

Mateusz Furs

Okay. Tell me if you had a situation that someone used this resin 1K only one K resin. Uh, but, uh, you, you use, like you mentioned the situation, you have the two K pump and you still use this 2K pump to inject this, uh, resin. One component is the resin and the other component is the water being injected simultaneously like 1 K component, uh, to my, their reaction, uh, happen even faster. Have you, had you seen something like this?

Stephan Delarue

Yes. Look, look, my [inaudible] it's funny because a couple of weeks ago I, a client called, uh, called me. They, um, it is not, not a concrete repair. It was a injection, uh, um, again against uprising moisture in the brickwork, but they use 1 component resin and uh, they know for sure the two component resin, uh, how to use, but they tried a one component because they thought, okay, maybe it's faster and uh, for any kind of reason, I don't know. Uh, two days later after the injection was finished, it was done. Then there's something wrong with the product. Uh, uh, let's say we move the packer, uh, we have some foam coming out of the, of the packer holes and then look, look, it's completely normal because the water, uh, the material needs the water for the reaction. And if you pump continuously and later there is no water present because the reaction is done because the foam pushed out the water and you remove the packer, the moisture comes again to that material, to that one component and it will react. This is standard. This is not a surprising situation. It is this product. They need water for the reaction. If nothing, if no water will be there, they stay there in the bore hole or in the concrete, uh, waiting for new water, which comes to them and then they react again. This is that for me, it's not the, a good controlled reaction, you know what I mean?

Mateusz Furs

Yes, I do. There is always a risk that there will be some resin that didn't have the opportunity to get in touch with the water and the water has been stopped like a minutes earlier and now this resin is staying, uh, and waiting and it can wait forever and to, for its reaction. So you really have to be careful when using this 1 K resins, they are friendly to use "users friendly", they say, but, as everywhere. You need to be careful. Okay.

Stephan Delarue

It's, you need to know your... let's say your target that you have to fulfill.

Mateusz Furs

I think that I wouldn't use and I have never used an PU based resin, uh, inject into the brickwork, uh, to stop this, you know, rising monster. Uh, if I use, uh, injection, uh, we take the gel,, but this is totally different. Um, different subjects for another, another three or five hours conversation, I think. We have a special type of PU based resin that, that have a very long, I mean very long. I mean over a hundred minutes long pot life. Uh, what, uh, what is the purpose for this kind of resins?

Stephan Delarue

Okay. Look, um, if you, if you talk about a long pot life and constructions, uh, thicker constructions and a crack repair in a concrete, uh, let's say, uh, structure where you have a thickness of a meter, for example, the target is to close the crack. Uh, the target should be, well let's say the filling ratio of the crack should be 90% or higher. And let's say the standard should be 90%. That's the target. And if you use, uh, if you use a resin which has let's say a short pot

life or a short, uh, reaction time, then you are, let's say not sure to penetrate the whole structure or the thickness of the structure. This is the, advantage of, or this is the reason why such a resin are developed to give you,, the chance for you to, during the injection to penetrate the whole thickness that you need.

Mateusz Furs

Okay. I always, uh, been thinking about this long pot lives. It's like a, if you imagine a graph and you have the time and the viscosity. So this long pot lives gives you the low viscosity for a longer amount of time. Yes. So you can inject, uh, with the lowest possible pressure in order not to break the construction because we are there to repair it, right? So, uh, we need to use the lowest possible, pressure on the pump. And then you don't have to be hurry because you have the long pot life, you have still a low viscosity. And when you combine it with the mixing really, really little amount of A and B components, you still use fresh, always quality, uh, resonance. This is, this is great in injections that you can have control it and the whole process of injection.

Stephan Delarue

Yes, that's right. If you mix the material, let's say, and it's fresh, you have your, let's say viscosity or I have a low viscosity, 100 mPa*s or 200 mPa*s and uh, you, you arrive as long as, as long as the day. If, if, if you need, uh, 30 minutes for the injection, this increases also you a viscosity of the, of the resin which is mixed maybe in your hopper. It's good to make it fresh by fresh. So, uh, to mix a small amount, to make sure that you have a low viscosity and the option allow a long pot life to penetrate the whole structure. And, um, the long let's say the long pot life has also the advantage that you have that you can do your second injection, which means after, after ending, your last packer after inject your last packet, you have backwards to the first packet, re-inject the crack again,

Mateusz Furs

this is, Oh my God, I really happy to hear this because this is very a common mistake I must say. Uh, when I was a product manager years ago, I was telling this as exactly as you, uh, do, uh, you do it at the moment because people tend to forget it. I all, I been telling that every six or eight packers, you come back to the section two, the first one of six, and you inject it once again. And can you explain us and our listeners once again, why is it so important to come back and re-inject the packers?

Stephan Delarue

Yes. Because the reason for that is you, you inside the structure, you have small fissures, which are, um, let's say, go, uh, small fissures or small honeycombs inside, inside the crack structure you have not the crack, which, which is is let's say a clean crack.

Mateusz Furs

Yeah. The crack, the crack is not only the crack itself, there are some, some additional cracks around and some pores and so on.

Stephan Delarue

Yes. And during your injection you push the material also in that fine, fine edges , areas inside your concrete edges. That means the material, disappears into that and therefore it is necessary to refill these, let's say, uh, first, uh, five or six packers again to make sure that the material is, uh, the crack is field in the right ratio and that you are not, you are losing resin for sure because, uh, then it penetrates in other honeycombs officials and to make sure that the crack is always be filled. Re-inject your first packers, five or six packers, then go forward to the next one, then go backwards. Just try everything. And during your pot life, during your gel time with your material.

Mateusz Furs

Okay. I absolutely agree. And this is, this is very important too, to take it into consideration while especially while, injecting a very little small, u cracks in the, in the concrete because then you make whatever is necessary to really feel it. As you mentioned, 90% of, filling the crack is necessary to, uh, to say that the crack is really field and really sealed.

Yes. I find one more good, explanation of using the, long port life of, um, uh, resin, uh, which is injection hoses. Can you tell us a little bit about this kind of application?

Stephan Delarue

Yeah. Injection hoses, they are, let's say it's the cheap version to do a good waterproofing before let's say you building is a, I'm completely done. Or after let's say, hoses are injection. Hoses are designed to do the injection later with the less, uh, let's say working, amount. You don't have to drill packers. Uh, you don't have to do the standard crack preparation for that. Um, they are designed to, uh, they will be installed inside the concrete, uh, to make sure that you do waterproofing with less amount of work. And therefore to feel and to, let's say to feel the joint where they are placed in the, in the field of, in the, in the field of the construction. Therefore you need also a, let's say a material with a low viscosity and the long pot life. It is completely, uh, let's say not similar to the crack in the injection, but it comes in that way. You have, you want to feel the whole area. You want to feel the whole joint where the, uh, hose is placed and therefore you need long time, a long time of pot life to get this field.

Mateusz Furs

Exactly. Uh, it is, used to inject the coal joints, but there is one main, condition to be fulfilled. The injection hoses has to be installed first before the concrete is cured. Like you have the bottom plate of the, let's say, underground garage, and you install the house, uh, in the place where the, uh, the walls will be, built, days they later. But without an injection holes, you can't use it. So you have to first design it and install it and then you can inject it. So this is the question. How can we you know, convince the decision makers on the job sites in our building projects to buy and use, uh, injection holes?

Stephan Delarue

Yeah, the, the main, the main answer I can give you that is if you, if you have, uh, let's say in your core and your joints or if you have a water, uh, ingress later after, uh, the building will, or let's say the building will be used after two or three years, uh, there's a, let's say your joints are leaking. Uh, therefore you have to do a waterproofing, which means drilling, installing packers, uh, inject, make it clean. Uh, after the injection. There are a lot of work, has to be done. If you use the injection hose and you place it before, like you, like you mentioned, you place a structure, uh, you don't have to drill, you don't have to clean it after that. It makes it much more easier the time, the time for them.

Mateusz Furs

So it's faster to seal this cold joint that is leaking. I assume that it's cheaper, because you, you spend less time on the job site, you don't have to drill, you don't have to think, about the connections between one part of the concrete and the other where this cold joint is located, uh, that, so this is all the questions that has to be answered before you drill, not after you drill. Definitely not after you inject. So yeah, you, you can uh, uh, make it faster and cheaper. This is it.

Stephan Delarue

Yes, it is faster. It is much more cheaper and it's much more efficient. It is, if it's necessary, you can inject it after two or three years later. So it is not necessary to inject it immediately after the construction is after your building is done. While the construction is done. It can be done later, which means you have options for, for later. It has to be not, not, not to be done immediately after the installation.

Mateusz Furs

Yeah. Actually I was asked was, uh, if it's necessary to feel the injection hoses, even if the construction, uh, is not leaking. I said no, like, you know, keep this hoses, uh, in case of, finding leakages years later. So, uh, it can be like an insurance. Stay in the, in the concrete. Okay. Um, can we say that, uh, it's necessary to really know the situation on the job sites to choose the right resin because we have, uh, mentioned at least six types of, uh, PU based resins so far. So, uh, what are the main questions to be asked, uh, in order to choose the right one?

Stephan Delarue

Yeah, it is, it is. It had to be a good crack analyst. I mean, they are cracks present on your construction, there and you have to ask. The reason for that why is why, why are the cracks, present or why, why, what is the reason for that? For the cracks and therefore, it is necessary to observe this Maybe the crack width, or what is the, uh, and, and finding the target for that. If it's, if the target is to do a structural repair, maybe you have to choose an epoxy, but this can be done, maybe, uh, only on dry cracks. Um, the reason, uh, should be clear, why are these cracks presence there and what target to fill or what is the target, how can we, what is the target for the injection?

Mateusz Furs

So first investigation on the job site, then the, uh, injection technology and then the application yes. Is the right order. Yes. Last question. Uh, I have talked to the person who use, who uses only one type of PU based resin, foaming one, the one, the one we mentioned in the beginning of our conversation. What would you tell to the person, to convince him to really take, uh, you know, some other options?

Stephan Delarue

It would, I would, I would tell him like we do like we did in the past in how to, during our conversation look, we never have to need the target first. And if the target is to seal the crack, uh, to 90%, and it is water-based, crack is what a dropping coming out then you want 1K product is much too fast to fill it in the right ratio. We need it. You want 1 K resin is a foam resin. Um, we should switch to the two component long pot life, low viscosity to make sure to penetrate the crack, uh, in the right, uh, volume that we need. This is my main thing. I would, I wouldn't use a one component PU foam resin for correct repair.

Mateusz Furs

There is another solution. Like if the person loves this kind of resin, he should only take the job sites where the goal is to stop the, you know, fast leaking water.

Stephan Delarue

Maybe you can leave the pot or the canister beside you and if you have to read, you have to, maybe you, if you stop, if you have to stop the water first with a, with a port your thing, foam resin, okay. Just use that, this material to stop the water then, but please use for the crack repair to make sure that you penetrate also a one meter of thickness of the structure with the material then use, please use a low viscosity material and the long pot life.

Mateusz Furs

Yeah. Okay. This is it. I think we mentioned everything as least for like, I hope so. And I also hope that there will be some questions concerning to our conversation. So we'll be happy together to answer them. In the end, I would like to ask you how our listeners can reach you. Where can you be found to, you know, to ask some questions maybe to, to discuss a job site, um, with you. So, if you could, uh, tell us.

Stephan Delarue

Okay. The easiest way is I am on LinkedIn. This is my, let's say it is my main, uh, uh, focus where you can, uh, ask me some questions. If you go on my profile. Uh, if you look at my profile, you will, um, you can ask me some questions. You can discuss, uh, uh, things about, uh, constructions around maybe also some epoxy or acrylic gel system or you go on my company, uh, address, uh, a company. Uh, my company name is WEBAC or you can also contact me about this, uh, address and, uh, this is um, my two, uh, the two, uh, points where you can reach me.

Mateusz Furs

Well, I will just say that we will pull this contact links in the notes of this episode so everyone who is interested in staying in touch with you will be, uh, it can be easy to, it can be easy to find you. Thanks a lot for this conversation. I really hope to have you once, uh, once again, uh, or even more, uh, for another topics. Uh, as we can see, uh, only PU based resins and we just, uh, spent over 40 minutes, on our conversation. Um, thanks a lot. Have a good day and talk to you soon. Bye. Bye.

Stephan Delarue

Mateusz was a great pleasure for me to be a part of this discussion. And yeah, let's see about the comments.

Mateusz Furs

Yeah. I really can't wait for that.

Stephan Delarue

Yeah. I'm, I'm keen about this. So, um, yeah, it was a great pleasure for me and we have only a small amount we discussed, so it is much more complicated area. So let's see what, what will happen. Thank you for that. And, uh, take care and yeah, have a good day

Mateusz Furs

Stay healthy and goodbye!

Stephan Delarue

You too, you too.

Mateusz Furs

Wow, lots of information. All we need to do is to give it a try.

Especially when it comes to stopping the high water flow.

Thanks again for this Stefan.

Actually, can you see the need of making an episode discussing how to handle this one on the most difficult injection jobs? Who would you like to meet in a podcast as an expert in this field?

Please drop a comment on this.

Polyurethane based resins are used in around 80% of all injection cases. It has a truly wide range of applications.

And there is a huge variety of them so no wonder why it seems to be a difficulty in choosing the right product.

When I called to invite Stephan for this interview I already knew that this was going to be absolutely amazing.

Now! it's up to us designers, applicators, and suppliers, to take the best possible solution suited to the job site conditions.

OK

Thanks for listening, remember to subscribe. And I hope you tune in next time!