



How to seal the dilatation of the tank without entering it?

Concrete Injection Made Easy

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SUMMARY KEYWORDS

resin, injection, leakage, tank, problem, lances, water, Bolivia, lance, pump, pipe, inject, meters, packer, stop, holes, humidity, joint, leaking, absolutely

SPEAKERS

Frank Hölzel, Mateusz Furs

Mateusz Furs

This is the Concrete Injection Made Easy podcast. Session No 15.

Today we are in Bolivia with Frank who has been living there for 15 years.

This conversation is special because it shows how you can find and create space in your own life.

As he will tell you himself, Frank was looking for an occupation in Bolivia and finally created his own working place. How?

He used the knowledge acquired in Europe not only to perform structural repairs but at the beginning to discover such a need on the local market.

Today, during a pandemic, when people lose their jobs, this ability to adapt and discover real needs seems priceless.

If you are a contractor of injection technology, you will certainly be interested in the technology of leaking through the dilatations of the tank.

How to seal a tank without entering it?

Frank explains in detail how he carried out this assignment, what kind of resin he used, and why this solution was the best possible one.

Make sure you stay till the end because Frank has some great advice for anyone in the concrete injection repair industry.

This is the conversation.

Hello Frank, how are you doing there?

Frank Hölzel

I'm fine here we are in Bolivia.

Wow.

Frank Hölzel

12 mil 12,000 kilometers from Poland.

Mateusz Furs

Yeah, I can see you I can hear you like you're over here.

Frank Hölzel

We are in the summertime we have 30 to 35 degrees. It's very hot enough for injection.

Mateusz Furs

So I can tell you the this is the middle of harvest season in Poland we have rainy season it's raining outside in the moment as we speak. And I told you that I can just confirm that you know, the more rain outside the more it rains the more my phone calls. So 35C degrees, I can see that you get perfect, great looking surrounding around you. I am in my office, which is in one my room in my apartment 15 kilometers from Warsaw. And we have this conversation because you are a fan of injection you are applicators yourself and and you live in Bolivia. So can you tell us a little bit? How is it to live there? And how is it to run a business in Bolivia in concrete repair and injection?

Frank Hölzel

Yeah, my name is Frank Holzer. You're your side the Berlin Germany. Yeah.

Mateusz Furs

And it's just around the corner corner from where I am now.

Frank Hölzel

So I live now 15 years in Bolivia. Bolivia it is very good for injection problems. There's a lot of wet weather here we have one of the one of the countries with mothering ever. It's raining permanent and it's tropical. I just tropical. And the other part. Is it plan. Oh, as I said, mountains. So we have a lot of problems here with humidity, agral water and everything. It's very complicated.

Mateusz Furs

It seems like you're busy all the time.

Frank Hölzel

I'm busy all the time. Yeah. Oh, like you.

Mateusz Furs

Oh, yeah. Like me. Yeah, I'm busy as well without having to move to Bolivia. But I would like to visit the place.

Frank Hölzel

It's very nice here. can be absolutely what they see. And just around you. So you move there to start this business or like what made you to move to Bolivia 15 years ago? Ah, to go to Bolivia. Just one reason. You you meet a girl.

Mateusz Furs

I felt so but I wasn't sure.

Frank Hölzel

This in the beginning, there was no no other reason to come here. Or that the country is very nice. It's very nice country. nice people. Ather thing so complicated that, okay, it's there.

Mateusz Furs

And then you started to think about your own business right away? Or like, when did you start to run this injection?

Frank Hölzel

Yeah, I worked in Germany with injection a couple of times. And I was looking here when I'm about two years. What What can I do here? Because it's, it's not too easy knowing that the construction is very bad. So I thought okay, you can make an injection here now. So I contact a couple of companies, he who wants to work with me in Bolivia. So at least it was it was Webac. There was they were very open to work with me. And now I'm working 11-12 years with WEBAC here.

Mateusz Furs

Alright, but so you work with them. You mean you use their product or use your or you are their employee over there in Bolivia?

Frank Hölzel

You know, I use the products and they helped me with technical stuff and everything I see you do I have a problem that I don't know exactly. I make a report and they answer very quickly.

Mateusz Furs

I see. All right, so, so the story goes, you need, you need a, let's say, resin, and you buy directly from WEBAC Germany or there is a WEBAC in Bolivia or somewhere, around you?

Frank Hölzel

Nobody here we are only in Bolivia and in Brazil. We work now with Webac. So directly from Hamburg.

Mateusz Furs

So we'll buy directly from Germany. I see. Okay. Like two weeks ago, you send me we have this we had this agreement even before that if you if you have an interesting project, to tell, we will have this conversation and you finally findly the send me this interesting pictures. I was on my way to a job sites 300 and something kilometers from Warsaw, when I got this message on my LinkedIn, and on my mobile that you sent me the pictures. I was there with my employee. So he was like from pictures from Bolivia, I need to see it. He's also a fan of injections. And then so yeah, we've seen this and we said that great idea. Lances. you can't enter into the tank. Yeah. So difficult, complicated story. So tell us the story. Please. Tank. you aside, but there is a leakage from the expansion joint. This is exactly what I know. And now please give us all the details of the problem. And then your solution.

Frank Hölzel

okay, we have a day where we have three tanks here in Santa Cruz, the city where I live, they are the same same construction, they are 35 to 35 meters and five meters high. So, in two other tanks, they can stop the water and I can get in and fix the water stop. So the third tank I can't get in to the consume of that water is very high. So they can't stop the tank. Yeah, so I look for a solution to work from outside the tank.

Mateusz Furs

So now the question is, we need to explain to our listeners where is the leakage? The leakage is through the expansion joint in the bottom.

Frank Hölzel

Exactly. That water stop to depth about 35 centimeters. So in the middle dancer like a canal and then the plates of the concrete. As is moving when the water will get down and stepfull in the night. The plates begin to move. Yeah, so

Mateusz Furs

So what stop can't survive it this actually.

Frank Hölzel

Yeah, exactly. So it's cutting, part per part the waterstop. So you can see outside of the tank, there's a there's a canal. And normal, it have to be dry. And they look for little, it's getting into get an hour in there. And that's water care down down the tank is leaking you know.

Mateusz Furs

So the water from inside the tank when it's when it's full of water, the pressure of the water that's inside makes that water goes out through this expansion joint.

Frank Hölzel

In the morning, there's pressure of five meters water. And at noon, it's about 3,50 meters. And six in the in the night. It's synchronous individuals, 50 centimeters

Mateusz Furs

So almost empty

Frank Hölzel

Almost empty. So that was after after 7pm they begin to fill it up again. It's filled up at two o'clock, three o'clock in the morning. And then at six o'clock.

Mateusz Furs

Yeah, the whole journey starts once again.

Frank Hölzel

Exactly.

Mateusz Furs

So if you can't get in and they can shut this tank from being used even for one day, and there is a leakage. And you obviously need to stop the water from going outside. What did you suggest to your client? How did you solve it?

Frank Hölzel

Okay, the problem is the tank there, but the tank is a little bit more elevated...

Mateusz Furs

Higher than the higher than the ground.

Frank Hölzel

higher than the basement. Hmm. So we could we have access on the tank, the backhoe underneath the underneath the bottom of the tank. So we put down by side the earth. And when when you open it, you can see where it's leaking more water and you can see where it's leaking mains water. And so we opened up about four meters and we see exactly dhanda where the water

Mateusz Furs

when there wasn't cold when the water when the water was flowing out yeah hmm.

Frank Hölzel

So in this point, we put dos pipes from those pipes 60 millimeters mm hmm

Mateusz Furs

so basically you produced on your own injection lances.

Frank Hölzel

Yeah, so I don't have Lance's here and I had to make some. So, I knew the distance from the tank to the inside where the water stop I know the distance. So

Mateusz Furs

So what was the what was the distance? How what what what what was the the length of the lance?

Frank Hölzel

When we touching 1,80 it alright.

Mateusz Furs

You are lucky. You should be you know two and a half the leakage could have been in the middle.

Frank Hölzel

Yes. But okay, we know they have water stop around the tank. So and the mass the more problems is in the basement the close to the wall it's all fixed there there's moving nothing but you have plates of concrete There are five to five meters and there's beginning to move The first movement just in so it has to water stop wetness, Whoa, it's tied to the wall All right. So we cut the tubes two meters, two meters 50 and marked exactly the distance. So we know how much the tube and get in you know? Yeah. Then we put 234 hold just hold the four or five millimeters. Nothing else and we put for the packer we put on when packer there

Mateusz Furs

yeah injection packer inside.

Frank Hölzel

for no loose the product. You Know. See no the product is going directly in is going to other sides. Yeah. So we had we perforated for waiting for holes that holes be up pull it up and marked also in the outside so when you put the lances in the pipe will drill a little bit so you don't know where the holes are. So you can marked in desperate after after the land stay inside you can move it you can turn it to be sure that the holes in the lances are vertical.

Mateusz Furs

You can turn it to be sure that the holes in the lances are vertical.

Frank Hölzel

Exactly towards the leakage. Yeah, I get the point very clever because at first I thought that you have drilled these holes in different directions so the resin could spread you know all around the lance in the ground. You can make it like this but you know we have the problem is from the lance Vertical upside.

Mateusz Furs

Yeah, I know

Frank Hölzel

to make holes by the sides. No downside for him? No.

Mateusz Furs

What was the spacing between the holes like this?

Frank Hölzel

5 centimeters.

Mateusz Furs

Every five centimeters a hole.

Frank Hölzel

We made 3 holes. so you can play a little bit. You don't have to see very Exactly. The leakages stop. No. And also you need a little space for the point of expansion. So if you are making just where the water stop is, it could be there is no enough resin for permanent sealing, yeah.

Mateusz Furs

So all right, you knew where the leakage was. You have prepared this injection laces. you installed them using the electricity tool, hammer Yeah, yeah, yeah. So it's installed then you make sure that holes are vertical towards the leaking, leaking place. You're sure that when you inject the resin, the resin finds its way against the water to stop it.

Frank Hölzel

Exactly, exactly.

Mateusz Furs

And so the question is, what kind of resin did you use and why?

Frank Hölzel

We use Webac 150. It's expanding resin.

Mateusz Furs

Yeah, it's a fast reacting polyurethane resin. A foam that can expand in even 40 times I guess. It was because I knew what was the resin. So I've seen the technical datasheet I always like whenever I discuss this kind of technical things. I always look at the TDS because it's everything they're mentioned and described. I love this. Oh, you use this present? How much was in by the way did use?

Frank Hölzel

in in this two packera we put about five kilos? five kilos.

Mateusz Furs

Per each packer? Yeah?

Frank Hölzel

Each packet two and a half kilos two and a half four? Okay, totally five five kg five kg so it's not too much actually it's much less than I fought? Yeah. It's okay when you get when you get the point correctly. You don't need allow for a scene but if you have to try here and there if six Lance's to come home with consumption, will we be higher? So what happened after you started to inject like, and by the way, you used I guess, one k pump? Yeah, one k pump? Yeah. It was the because I had this short movie. And I didn't see the pound but they heard it. So really cool. It was the pound this diaphragm one right. Yeah. One electric one Yeah. Okay. So, you start to inject the resin starts to flow inside the this injection Lance and what happens you observe the situation so what happens then? Okay at first we injected in one Packer hmm and the book will get in very slowly there was contract Casio on idle pressure. So, they get in slowly. So we injected two kilos slowly and the flow of the water was getting down very slowly. So we see when you need we enacted the flow was going down. So we we knew where we are close we are not we are not at the point correctly. So we put the receipt in the second Taka injection injected after five seconds. It stops working directly

Mateusz Furs

Like a miracle.

Frank Hölzel

but I told you we we put a two and a half kilos in there for a big bomb, huh? So take some water no no can flow and in. In other words...

Mateusz Furs

So can we say that because the injection lances was installed in the ground that was just underneath the bottom slab of the tank? Yeah. So, this is the surface of the of the bottom slab and then there is injection lance just manganese exactly like Yeah. So can we say that this resin had penetrated inside the expansion joint little bit?, and the rest created this huge foam bubble in the ground?

Frank Hölzel

Exactly. About also there was getting, I think a little bit inside of the tank. But a little bit No, not much. We didn't see nothing, but I think that they was getting in a little bit.

Mateusz Furs

Yeah, I see. So can Did you see any resin on the on the water or surface inside the tank?

Frank Hölzel

No, we do see nothing. Okay, so whether where the door of the tank is it's about 15 meters. So we didn't see nothing.

Mateusz Furs

I see all right. So the the resin didn't get into the tank most probably it stayed inside the expansion joint on the bottom side of the of the of this. So I know that there are like two ways of installing injection lances and actually injection running an injection into this injection Lances. One is that you install this injection last and you inject into through it, Yeah, yeah and the other one is that you install this and while you start pumping the resin you start to pull and remove the injection lance. Yeah. So which Which way did you choose?

Frank Hölzel

We choose the first way because we knew where the problem. So when the water stop is going inside the tank we have to make lances much longer and pulls him out. But so it was always on time to the wall the water the water stop and we knew there is no other point after that one this book conquered there would be no problem but if they are in water stop crews so you have to make the lance longer more points perforation and pull it out talk a little deeper little para resin inject all the way down to three meters

Mateusz Furs

Yeah. Down Down expansion joint what the problem Yeah, so everything was I won't say easier but differently because you exactly knew where was the leakage so you could really focus on this very special point. Absolutely. Okay. So the reactions starts after a few seconds it stops the water is stopped what happens there? Did you remove the and lance from from it from the ground or it stayed there?

Frank Hölzel

No, it stay there.

Mateusz Furs

Okay. And it will stay. You won't...

Frank Hölzel

No problem. Because the tube the pipe is full of resin. If you pull it out, it probably make a hole.

Mateusz Furs

Yeah. Yeah.

Frank Hölzel

leak water again. Yeah, just you have your tube No. Yeah.

Mateusz Furs

I was wondering that, since we just agreed that you use this fast reacting forming resin. I was asking myself this question. If I if I were you, of course, over the if I if I would use some other resin to view or accurate doesn't matter actually, to make this water seal for like, really permanent because this phone can, can can be filled with water in the future someday. And perhaps the lakage will occur again so what do you think about this?

Frank Hölzel

That's absolutely correctly, but they will build a second tank. The construction will begin in one month. So and we have and in six, seven months we have a second tank. Okay, so we can empty this tank a fix it for insight with the product WEBAC to us current josiane 240.

Mateusz Furs

All right.

Frank Hölzel

Merchant Spanish

Mateusz Furs

English

Frank Hölzel

and it will be much cheaper. No, I'll do it from inside. Absolutely.

Mateusz Furs

Like the most important most important aspect when sitting the expansion joint is really cleaning the concrete walls internal concrete walls inside the expansion joint. You couldn't obviously do it this time. But when you can enter the tank, then everything everything absolutely you can set up and spend their two weeks and make it this this claim right?

Frank Hölzel

That we did with two tanks. And it's working very good. Okay. Oh, you think I fought years ago?

Mateusz Furs

Yeah. How many years ago?

Frank Hölzel

Five years ago. Five years ago.

Mateusz Furs

So fixed the same kind of thing five years ago and it's still it's still right it's still dry right?

Frank Hölzel

Still dry. Okay.

Mateusz Furs

All right. What was the most important and let's say most difficult you know with this injection. Lances? Choosing the rise in finding the right the right leaking spot. What was the most important and most difficult?

Frank Hölzel

most of you can get the idea how to fix it. How can you fix this? How can you fix it without going inside? Oh, you oh you make it okay. You know they are lenses. Okay can get lenses? But they didn't now I can wait three months until to come they're the product to Bolivia. Oh, yeah. It takes three months to get there. No. Wow. Is it so not thinking about okay. Buy tubes. But at first I thought about with gay pakka that they said they will enter our mutual lot of resin? No, no, at least I go with a packer to a store looking for a pipe where the packet match the diameter. So I got one the wall of the tube was very kindly, thin, very thin. So with a hammer, I guess to get in and directly it was broken.

Mateusz Furs

Yeah. Alright.

Frank Hölzel

So you do it another pipe. Another pipe where the wall is mass. More material. Yeah. So you can get with a good matter here. No, this is all it's cool. They are 40 years behind us. Oh my god, everything is 40 years behind us. It's very difficult to get the stuff you need new. So everything I came get from Germany I get it from Germany. When I buy material in the factory, they they have to look for other stuff like hammers and everything else.

Mateusz Furs

So tell me this this question is not really connected with this particular project but you I imagine that you have to buy much more resin to have it on your own stock at your own place. Because you can't wait 4 months to delivery. When the Water is leaking or that you have to fix it right away.

Frank Hölzel

We have project we have projects. They're really big. We added a tunnel with a was gell. And we make a sale directly from the from the fabric So they have they were wait two three months in projects take bigger projects now I also have my my stock as for everything kit like next small stuff. I think so I already have basics, I have gel 14, their address three 150 1660 a parkmore. So I, when I needed product bigger, I can chose other resins. So that emergencies and everything I have in stock, yeah. So it's here we have big problems with temperatures. We have now a 35 until 40 degrees every day. So

humidity 90% so when the way when when you pump resin and there is no flow, you have to stop. If you don't stop. It's getting hard inside the pump. Yeah, no, you have to go permanently if there is a flow? is there a flow? When there's no flow, you have to stop! doing that.

Mateusz Furs

Well, if you have the humidity of 90% then the resin reacts with the humidity in the air. Also in the pump in the hopper, in the pump.

Frank Hölzel

We have permanent like one centimeter is arch.

Mateusz Furs

Actually, it's good. This cover of foam on the on the top of the resin keeps the resin that is underneath fresh. resin underneath has no connection to the humidity.

Frank Hölzel

Exactly. It's difficult to clean everything.

Mateusz Furs

I know. I know. I know the story. That's the problem. Okay, so you used 5 kg. You fixed it. How many people worked with you to have this job done?

Frank Hölzel

Ahh just one person. We only with two persons.

Mateusz Furs

Okay.

Frank Hölzel

Yeah. When we have bigger joints? We always three three persons?

Mateusz Furs

Yeah, absolutely. Yeah. I always say that. typical injection team is two or three people working together, they know each other, they know exactly what they have to do. And without too much talking. They just know how to behave and where to drill. How to drill. Who is going to drill and who handles the pump and so on right?

Frank Hölzel

Exactly, like mixing everything. You don't even need to talk a lot. No, that's it. That's all the resin is is going down as the mixing the next one. It's all good work.

Mateusz Furs

Yeah, yeah. Yeah. I was about to ask you a question. Okay. Yeah, I know. How much time did you spend there to to fix it?

Frank Hölzel

It was about two hours.

Mateusz Furs

including the installation of injection houses. Two hours, two hours. Okay. So I guess that it will it took longer to figure it out how to solve it rather than to do it.

Frank Hölzel

Exactly. Yeah. And by biases by some pipe never seeing and it was more time than the work and the execution itself.

Mateusz Furs

Yeah. So two, two and a half hours the problem is solved are well until you can enter the tank to make it fully, fully watertight. I have faced this kind of business questions. But so they knew you solve the problem five years ago so they already knew you. So they already knew who to call. Do you think that they call also to some of your competitors to compare the price or the time of you know, the spend...

Frank Hölzel

No.

Mateusz Furs

No, they call directly you and only you?

Frank Hölzel

Only me! Yeah, okay. This is great. I they know I fix it and they don't want to know and they're excellent. In Bolivia, they are no, no companies. They make this okay and little bit with this pump from China. In the injection of epoxy..

Mateusz Furs

Drill, pump...?

Frank Hölzel

Drill pump injection, little bit epoxy. But that's not none no competition.

Mateusz Furs

I see. So you are the only company in whole country. You're lucky.

Frank Hölzel

I am lucky.

Mateusz Furs

I need to model the problem the problem is a price. Well, everybody wants grantees who have it's cheaper I think I know the story. But uh, I don't know if you heard this conversation with Hamid Sohrabie from Iran, and he told me that you know, the injection is expensive, expensive. The resin is expensive, the the tools are expensive, pumps are expensive. The whole service is expensive, because it's difficult. And there are not too many people. And in Iran, like at your place there is it's not easy to find the right tools. He told me that he wanted to use some other resin, but he couldn't get it. So he bought this one. Of course, he solved the problem. And he he made he watertight the tunnel. But uh,

this is expensive. And it's expensive everywhere. And all the clients are more or less the same. They want and they are looking for solution. That's it. But they are looking for a solution to make it cheaper.

Frank Hölzel

Exactly. It's the problem. It's the product. No, it's very expensive. But until it is here in my warehouse. That's that make it expensive. Yeah. To have to go from Hamburg. To the ship. The ship to Arica in Chile. In Chile it goes two times 5000 meters high. The cans. Come here...squeezed. Yo, it's all and sometimes they're broken. And mine. Yeah, comes everything. So that makes it expensive. Then makes? Yeah.

Mateusz Furs

All right. I'm thinking about if we have discussed everything, yeah, the technology is, is is beautiful, because it's simple. And you used every single thing you had access to a pipe, resin Packers pump, your team, your experience, which is great, which is absolutely great. And you solve the situation. This is how the injection applicators worldwide work. You just find the solution and you go there to make it happen. Which is absolutely right. And I wanted to say that congratulations. For this project. As I said with my employee with the we were looking at the pictures from you. And we were like they did it. Yeah that's great idea with the with the Lance's brilliant idea how to use it to to make a little bit this big, this little hole to be sure that you are underneath the bottom slab of this tank. Beautiful. So this is like the spirit the spirit of our industry.

Frank Hölzel

That's it. Then, like I like to just fall for, it's not all always the same. When you when you fix the car, everything is the same. You type take it out, put a new one in. When we have to think every time every time was a new solution.

Mateusz Furs

Usually when if you use the same resin, you drill differently, different angle, different depth, and different job site, different concrete different. Everything's different every single time. Yeah. I remember this story. I was working for another German company and I was on the meeting in in Germany. And I tell this, this manager that you know, I've been working here for two months and I haven't seen two same job sites. And he says, you know I've been working here for 20 years and I haven't seen two same jobs.

Frank Hölzel

So Same place. No, that's not good.

Mateusz Furs

Do you have any good advice to young people wanting to really enter this injection industry? What would be your advice to young people?

Frank Hölzel

Yeah, don't be afraid. oriane completely afraid. Don't be afraid. Think before you. You work, think and then make it make it happen until it works. So in the beginning, you will loose packers, you will lose resin. But you will learn quickly collared our works better. Just you have to you just do it No. Like, yeah.

Mateusz Furs

What you said in the beginning of our conversation was really, really important to ask questions, because you told that you had the you have written this report to your colleagues in Germany, to ask him to help. So asking questions is also important.

Frank Hölzel

It's important. Yeah. Well, you don't you don't you can find a solution. Call them therefore that. Yeah, totally. This is the job actually.

Mateusz Furs

So you are the only one and they work together. They have years of experience. Yeah, in the company like Webac or any other manufacturer. Yeah, they have people really traveling around the world seeing things on the job side. Having this kind of conversation, by the way, because this kind of conversation is also a tool to actually know, to exchange our our knowledge, which is which is cool. This is why I started the podcast. Yeah, by the way.

Frank Hölzel

That's good. Yeah. So it's an information for the people and they can make it the same or better. See better is he up? We can make this better. Okay, make it better in the next podcast. You can tell us.

Mateusz Furs

That will be great. Thank you for this conversation. Thank you for finding time. what's the what's the time at your place, by the way?

Frank Hölzel

Oh, it's noon. 12 15. Time to eat.

Mateusz Furs

6.15 PM in Warsaw, Poland at the moment. So once again thank you for finding this time to spend with me, you know, my Friday is about to be over. And you are just entering it after Friday. Have a great rest of the day. Thank you very much for for this conversation and All the best to you and your team. Bye bye. Thank you.

Frank Hölzel

Thanks, bye bye.

Mateusz Furs

Where is a need, there is a solution.

And as we can see, the injection can be carried out even in the difficult conditions of the lack of regular supplies, and high temperature and humidity by a small group of trained people.

This conversation proves once again, that persistence is one of the most important qualities needed in our industry.

I wonder how you deal with similar challenges?

Have you done an interesting repair and would you like to tell about it to a wider audience?

Maybe you have sealed a dam or a tunnel somewhere?

Share your experience and make this knowledge to go further into the world.

Thank you again, Frank, for this conversation, photos, and street sounds of your city that we're listening to right now.

As you may have realized, they accompanied us during this podcast.

Another episode of Concrete Injection Made Easy is in two weeks.

Make sure you hit subscribe if you haven't already, and I hope you will tune in next time.