

# **ExSACT** interviews on *Intellectual Property:*

## **Glass2Mass\* project**

\* *High-Performance, High-Resolution Optical Components in Fused.*

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ATTRACT phase 2 project: [Glass2Mass](#)



### What is the Glass2Mass project and what is your role?

I am Bastian Rapp, and I am the coordinator of the [Glass2Mass project](#). In the last month, we developed an easier process to get to glass components for mass-market manufacturing. We have developed a novel methodology to make glass components using polymer shaping technology and within this project, we will develop a technique based on a process known as nanoimprint lithography, which allows us to make high-precision optical components in a pretty fast manner using our material technology.

In the consortium, we have a couple of companies that are active in the field, including **Nanoscribe GmbH & Co. KG**, one of the market leaders in the field of high-resolution 3D printing by direct laser writing; **EV Group E. Thallner GmbH**, which is one of the market leaders in the field of nanoimprint lithography instrumentation; **OSRAM Opto Semiconductors GmbH**, a company in the field of projection, optics, and illumination, which is interested in using this technology for making components, optical components mostly, for a pretty wide range of applications that actually require the use of high-quality glasses for high radiation doses or light sources with pretty high intensity.

### Glassomer and Nanoscribe are SMEs, and EV group and OSRAM are big companies. Do you notice a difference in the size of the companies?

The larger companies, obviously have a significantly higher inertia. Moving budgets, moving clearance for projects, assigning folks to projects, is done in a completely different way from the SME perspective where you basically have a project, and you pull in the folks that have the most fitting competencies that actually work on the project. Large companies always need to budget everything, including technicians that run regular maintenance jobs on machines, for example, because that's just the way that they budget. The decision process within the larger companies is significantly more challenging than in the small SMEs.

### As a coordinator, how have you established connections with these companies?

We knew them already from prior work. With Nanoscribe, we had a project together in **ATTRACT phase 1**. We identified this as a market need because we have many different projects that require high-precision optics, but at lower cycle numbers. And we always wanted to have nanoimprint lithography as a technology for doing that. When **ATTRACT phase 2** came along, we pulled everyone together and said that we should sit together and write this project

proposal because we have all the pieces. Each one has one key technology in order to make it happen, so let's make it happen. And that is how that came about.

**What is your strategy for intellectual property management? Have you foreseen specific IPs when creating the project?**

Within ATTRACT, we are relatively speaking not a large project. We are one of the smaller types of projects, not the €2 million, but the half million Euro project funding. In our collaboration agreement, we said that any **Intellectual Property (IP)** developed by one partner will remain within the realm of that one partner. There would be no implied IP. If IP was shared on a shared development innovation, then obviously. To be very frank, because its various partners coming together, each chipping in their piece of technology and novelty, we didn't really foresee this as a great problem. When foreign background IP is clearly laid out, which it is in this case, then it's not really a big problem.

On the actual material shaping and formulation technology, **Glassomer** has a pretty broad IP, which was already established previously, so there were no big questions as to who would be owning the IP. We didn't go into potential monetization or commercialization strategies on a larger scheme at this point, because we wanted to run this project and see what we end up with, and if something really good comes out of it, then we will be figuring out a way to monetize that. It is not that complicated for the technology providers to work together and for each to bring in their technology.

**Do you cooperate also with universities or some research organisations within this project?**

I'm a university professor as well so there is a university involved. Glassomer is a spin-off of **Freiburg University**, so there was already an established collaboration agreement with that university. We cooperate not just in this project but in many other projects as well. But everything is very well regulated. We have collaboration agreements in place also for IP sharing, not just from Glass2Mass, but also for other projects that are running between the company and the spin-off.

**You mentioned sharing IP agreements. What kind of agreements are they? General or something else?**

Yes, general **Joint Development Agreements (JDA)**. The way that you usually set up a JDA. To find background IP, foreground IP will remain the property of whoever invents it and if something is joint, then our collaboration agreement states we would need to negotiate further how this would be set up. We don't actually expect this to be relevant. In many cases on very precise and defined projects, we have sort of fallen back to not over-defining this in an initial contract.

In larger companies, usually legal departments focus on larger rounds of IP. They chip in and want to have their regular templates implemented and then that collides if you have two larger companies in there, etc. From my own experience, I have set up several dozens of collaboration agreements over the years, it doesn't really make a lot of sense to over-define this at the beginning because in 99% of the cases, that case will never pop up. And if it pops up, you still have to deal with it, but it makes more sense to deal with it if you require it, rather than over-defining this at the beginning, which will get the project nowhere.

**It is a general problem for the contracts to decide how much detail you define things. Could you tell us more about the Joint Development Agreements?**

We have templates for them which are the templates that we start out with. Large companies always want to start with their own template. In the end, we can work with this as well. It takes a bit longer to implement all the details that the large companies will have there.

**I mentioned the State Aid rules. This is something that the European Commission pays attention to, so they set the rules especially in order not to distort the internal market. One of the aspects of these rules is the relationship between the research organizations and companies. It's foreseen that Research Services in contract research are offered at the market price and also the intellectual property transfer in the collaboration projects must be suitably compensated financially. In simple terms, this means that companies shouldn't get unallowed discounts or free intellectual property. How familiar are you with these rules?**

We are familiar with these rules because those are the fundamental collaboration rules of all the spin-off company collaboration agreements between universities and spin-off companies. These rules set down some pretty understandable guidelines and the university is pretty strict about these things as well, because they don't want IP bleeding out of the university at no cost, and they don't want resources to flow out either. Whenever we use university equipment or university services, we pay for them.

This is not something that is spectacular in a sense. I am a professor at the Faculty of Engineering in Freiburg, and we offer many services to industry, including clean room services, analysis services, etcetera. We have user facilities, user guidelines, and user fees that basically define these costs. The spin-off companies are treated no other than external companies. They are billed at exactly the same rates, and they are billed at exactly the same expenses, and they don't have priority over anyone in the pipeline. Chances are that if we want to have something done, it may take a couple of weeks if the pipeline is currently pretty full.

**Do you make a strict line between the contract research where the company pays 100% and collaboration projects where there is a common goal for both entities?**

I cannot speak for the university as a whole because they have IP and transfer offices that actually take care of the balancing details. In general, any research done at universities on contractual work may have some boundaries implied, but there are some things that are non-negotiable. First and foremost, the technology developed at the university is free to be used in research and training. Even if the company pays for that, the university will still retain the rights to use the developed technology in research and training. The university is an open academic institution, which means that whoever works on these projects, mostly those who will be Ph.D. students, need to be free to publish their research given certain terms. This is not something that can be negotiated out of contract.

**You mentioned that Glassomer is a spin-off company from the university. Can you please share more information on how the company was created and how it all started?**

Glassomer is a company which is spun out of my laboratory. The technology was developed by one of my former PhD students. The funding of the company was done in 2018 and the company has been active on the market since then. In the beginning, it operated as a sort of

print-on-demand shop doing 3D printing of glass and glass-based components for customers on the market. As is the regulation of the university, the spin-offs are supposed to move out of the university campus, thus at the end of 2021, the company moved out and into its own facilities, operating its own infrastructure and having a physical separation of function, if you will, between the university and company. A collaboration agreement is set in place for all of the spin-off companies, pretty much from the very beginning to clarify the expectations on both sides and also what sort of interfaces going in and out.

**You mentioned that you were at the university and at the spin-off company at the same time. Was it difficult to combine both roles?**

No, I don't think it was difficult. Being a university professor in the field of applied material science, I actually consider this part of my job. The point is, as an academic, you want to find solutions, but writing a paper and being done with it and hoping somebody picks that up is not a very sustainable way of providing technology transfer. On the other hand, we have many young folks coming to university that are eager to make a career and that are eager to change the world and make an impact.

My role is to support wherever I can, to open the doors to pathways, to help in terms of technology and material science, and whatever they need. I am not strongly involved in the day-to-day business operations of the company; these decisions are made by the core leadership team of the company. Many of my students, don't necessarily want to go to large companies because it can be difficult to access and start a career. They want to have a flexible work environment; they want to have the chance to actually make an impact.

A spin-off that comes out of a university can be an attractive transition here. In the last 20 years, we tracked this at the faculty, and we have generated several thousand employed full-time equivalent positions within and around Freiburg in the high-tech sector by spinoffs from the university alone. Most of them are former students and some of them are former Ph.D. students at the university, and that is one of the keys to why this area around Freiburg is such an innovative and buzzing area. If we at the university stopped doing that, then we would decouple academia and industry even further. Personally, I don't think that this is a conflict of interest. Once the rules are set down and it is clear that both sides will profit from that, and these are the modalities along which we work, then I think everything is clear, above board, and to the full advantage of both sides.

Another point is the perspective. Academia is a difficult environment and young people have a hard time finding permanent positions in academia. Folks have an interest in a certain topic, and they want to keep working there, but they do not want to go for a postdoc because it is a one-year contract extended over and over again and they want to have at least some reliability. Again, a spin-off is an attractive option for these cases. If you make it successful, this could be your career that boosts you up into realms that, in a larger cooperation, you would rarely be able to achieve. And that is something that many young people are really thrilled about. I think it's a win-win situation for both sides.

**Regarding intellectual property and its management for Glassomer, do you prefer patenting, or do you have more secret know-how? What is the third option?**

Because we are in a very intensive worked upon academic field in a very competitive environment, we always strive for patenting first and publishing second. This spin-off publishes very actively. We have contributions in large journals such as Science, which are co-written by folks at Glassomer. We are not secretive about what we do. We may be secretive about specific formulations, and there may be some more optimized variants of the recipes compared to what we published, but nothing of what we do here is trade secrets.

If you want to know what we do, you can look up our papers and publications. It gives the recipes that we have used at the time. A couple of years back we were using different protocols which may not be exactly the same as we use at this time. But we do publish, and we use this as a source of credibility. Many people who actually work in this field, read these journals, they see the company and the technology, and it gives credibility.

It is not some secret sauce setup that nobody knows exactly how we do that. It is not Theranos, where everybody said: "We have a solution, we just will not tell anyone how that solution works because it's super secret". No, this is published research that has passed the higher echelons of the academic validation system. It is in the literature, anyone who knows something about material science can look it up and validate and say "Yes, this is actually something that can work". Obviously, that sets competitors on the path, but we do have IP, so anyone that really wants to challenge us commercially, will have to challenge the IP as well. But, on the other hand, it gives us a lot of credibility because if you know someone who has a good material science background, have them look at our papers and have them give validation whether or not that is solid.

**Is this true for all the intellectual property of Glassomer or just the one that you developed together with the universities?**

No, for all the IP.

**Was all the intellectual property developed and owned by Glassomer? or Has Glassomer also purchased some licenses from other companies?**

The IP is owned and developed together with the University of Freiburg and the Karlsruhe Institute of Technology, my former employer. But we haven't bought external IP, so all of the IP that we work on is our own or co-owned between the company and the university.

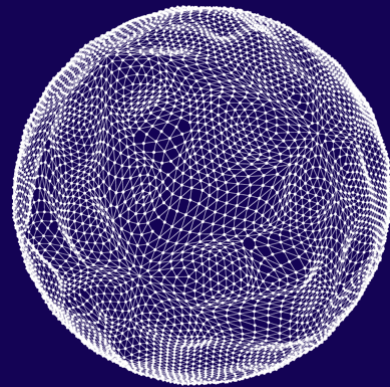
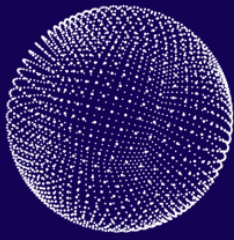
**Before you enter the market with a new product or a new service, do you check the other patents? or Do you use the freedom to operate analysis?**

Yes, absolutely. First, obviously, we assess freedom to operate before we know if we can actually do something in the market. We would also look at whether or not we can make a contribution in that market which would give us an edge over the competition. It's not just "I want to do that as well. Other people have already done that. Which IPs am I violating?". It's more a "We have a certain patent portfolio, and we have a certain technology skill set. Can we employ this in a new market making use of our previously owned IP which we may then need

to expand in order to match the new market requirements? Is there something that we can bring to the table in order to make it in the market?"

We are not just freeloading on a new market, seeing whatever IP we would need to work our way around. If we don't have a technological edge or something that we can have as a unique selling point over the competition, we usually don't operate in these markets. For a material solution provider, which is what we are, working over strong basic background IP, we feel very often very confident in operating in a certain market. If a customer wants to have a certain structure, for example, a very refined optical setup or a component with a certain haptic look and feel, and that is an IP owned by someone else, then that would be more of a problem for the customer using our technology in their market than for us because we provide the material and the structuring capabilities.

It's pretty much the same thing as a commercial injection molder, which does a component for a customer but will not guarantee the customer that the component they are manufacturing has the freedom to operate in the respective market. If somebody comes forward and says I want this made of glass, we manufacture this made of glass. If they can't sell it to the market because they are violating IP, that is not on us. But if we penetrate into new markets with an owned product and own idea on our own technology, we definitely evaluate freedom to operate before we do so.



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This project has received funding from the European Union's Horizon 2020 research and innovative programme under grant agreement No. 101004462