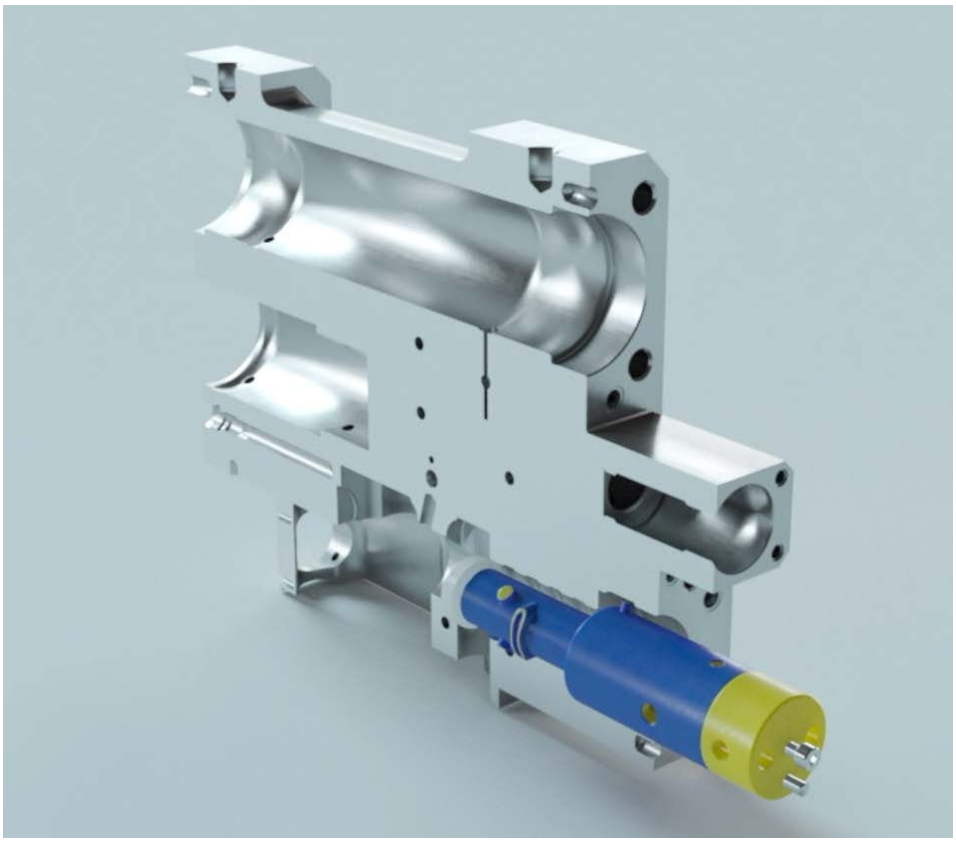
Extrude Hone press release.

July 17, 2024

From Automotive to Aerospace, the voice of industry experts today resonates with Mr. Siddhartha Sirdeshpande ‘s inspiring journey in electrochemical machining (ECM).



Mr. Siddhartha Sirdeshpande, a seasoned industry leader with solid operational acumen, currently serves as the VP of Operations at Adani Defense and Aerospace. His previous roles included Chief Operating Officer at Maini Precision Products, Thermocables, RSB Transmissions, and General Manager at UT Limited. His journey from using ECM in automotive to adopting it in aerospace is a testament to his expertise and will enlighten you.

Bruno Boutantin (Extrude Hone)

You have nearly 28 years of experience in various industries, ranging from hydraulics to steel manufacturing, heavy fabrication, wire, and cable extrusions, with a strong focus on precision machining in Aerospace and Automotive.

Siddhartha Sirdeshpande

Yes, as the head of operations in these industries, I'm always interested in precision parts manufacturing according to customer specifications and drawings, making the parts as per print. I'm used to working on RFQs from major OEMs or Tier 1. I have also been involved in providing end-to-end solutions in machining.

I worked on VOLVO's components with Magneti Marelli, now Marelli's next-generation GDI Pump, which stands for Gasoline Direct Injection Pump. In the hydraulic industry, I worked with Danfoss components.

My journey also includes working with significant aerospace customers, such as Safran and all its divisions, GE, Honeywell, Parker, and Marshall.

In the search for advanced machining solutions, I discovered Extrude Hone and Electrochemical Machining technology and got to know Mr. Debnath Goswami (MD Extrude Hone India).

So, basically, it started with a GDI pump. A gasoline direct injection pump is a stainless-steel forged body with complex machining and position tolerance. On a 5-axis, about 35-to-40-micron position tolerances, and then each bore on that thing is stainless steel, and then the dimensional tolerances are about 5 microns to a maximum of 15 microns. So, it's a complex part and then, uh, the deburring of those parts.

Because this goes to the gasoline direct injection application and, uh, this is used for 400 bar and 600 bar of fuel pressure.

So, the fuel is passing through. This pump generates that amount of pressure for direct injection into the combustion chamber. So, in this scenario, there should not be any, uh, burr or even the sharp edges which could be detached later as a burr on this thing because it's a heavy pressure and then if it gets stuck, it will be a safety critical issue on the, on the, on the Machines.

So, initially, when you had the lower version of this thing, the 100-bar capacity version, I was using a lot of Indian-made machines on it. One of the issues I found is that stainless steel with chromium forms chromates, which then becomes hazardous.

So, I was also looking forward to when we developed the sixth generation. Uh, that next-generation GDI with 600 bar pressure for Mazda, basically through Marelli, but the end customer was Mazda Japan. As the single manufacturer of that thing, maintaining a specific radius at the intersections was a critical requirement.

So, the intersections are not approachable from the outside, and we need to maintain a specific radius. So that was a critical thing. So, then, I came across, okay, let's have a solution from Extrude Hone. I got one machine for this, and it served the purpose. Then, subsequently, I developed all the other GDI on the same Extrude Hone machine.

So, basically, that has given the technical solution for getting the parts right the first time and consistently. So, initially, I faced some issues related to procuring the tools and maintaining the

inventory. But then, in that area, the Extrude Hone India team supported me, and then they told us, OK, based on your requirement, we can carry some of the tool inventory so that you don't need to carry that thing.

The lead time can be reduced or something like that. Then I could run this thing. So, I was still depending on Extrude Hone for the tooling part of these machines.

But then, after that, when I found a similar application in aerospace, for which I could do ECM, the aerospace industry was not using Extrude Hone.

So, then I contacted Debnath, and he contacted your French team. And then we introduced, okay, this is being used. But Safran was not in favor of that. I gave some references that these machines are used in Dassault Aerospace. So that's how I was trying to pitch in. And that development was in progress now with Debnath.

So once that development is completed, Safran could approve. Maybe for the aerospace industry component manufacturing, this would be the first process of going out of manual deburring and then introducing the ECM deburring process. So, there are advantages to this thing. You can save a lot of manpower and time on this thing because presently, on the aluminum manifold on aerospace, I was spending almost four and a half hours per component for debris, that too with a skilled mentor. But if it comes through extrude hone, this activity will be a maximum of two and a half minutes that we have done that thing.

That will be a massive change. Apart from that, it will completely reskill the operator activity. This will help because it will be more process and tool controlled. That is the area where I thought Extrude Hone had the right solution to this. And this is the way forward.

So, I was pushing my team to get this thing certified because, with Safran, it will take a longer time to get this thing approved as an aerospace new technology introduction and all these things.

BB

I'm very aware of the situation with Dassault because I'm a French guy, and we started the relationship with Dassault years ago. I've been with the company for 19 years, and it has taken nearly 10+ years to bring them to the point of using ECM in production for their manifolds.

Now they have this fantastic machine, a three-station / three-tooling machine that processes quite complex parts with more than 300+ locations to be processed.

And they deburr, radius, and polish, all simultaneously. And for the reasons you have mentioned, which are quality, efficiency, and productivity, but primarily for quality on their side. If you scratch a part when it's at the top of this added value, it's a big scrap, and it costs money. It's also a significant safety insurance that they can rely on ECM. When you do these things manually, you are never sure of the quality, especially when looking at the tolerances. In addition, you will need 100 percent control if you do this by hand, if you use a machine, you can rely on the machine.

Siddhartha Sirdeshpande

Yes, that is the one advantage of consistency when working on these GDI form bodies; I had to produce about 2,800 per day, so manually deburring 2,800 bodies is impossible.

And then the consistency of that thing. Maintain a minimum radius of 50 microns to a maximum of 100 microns within that range. It's not possible. So, obviously, the ECM is the right process. But then we have a good machine and then a lot of controls on that. It gives a consistent result. So that is helping us.

The quality is the first, but again, it's more on the consistent quality and consistency in the quality.

BB

We are pushing this ECM solution in the market. After all, people complain that first, it's tough to find the workforce, especially in the labor issue in the US and Europe, and second, it's related to the quality variation issue, between the first hour in the morning and the last hour of the day, consistency of the work from a human perspective is changing.

It's very difficult, and the requirements are quite demanding. There are also areas that are impossible to finish by hand.

Yes, ECM is not a cheap solution. Nevertheless, when you put everything in the balance from an aerospace component perspective, it's competitive and there are not so many capable alternatives.

Siddhartha Sirdeshpande

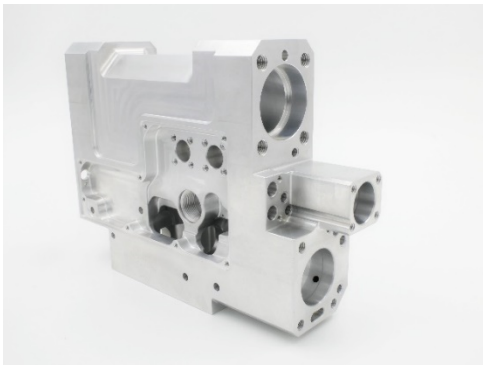
Yes. Yes. I think you should push ECM from the OEM so that it would be easy for the component manufacturer to adopt the same thing. As a VP of Operations, I'm working the other way around. So, I'm pushing aero customers like Safran, but if companies like Airbus uh, Boeing, and Dassault were pushing Safran to adopt this, then it would be a rather easy way to go further.

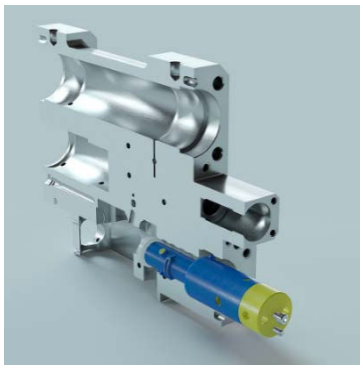
BB

We spend a lot of time visiting OEMs and talking with them because the more we can convince them, the more helpful it is for their suppliers.

And then we get there. It's okay. They understand now why their supplier was talking about this and why their supplier is saying they should use ECM.

And when you say who is doing it, yeah, that becomes a testimony. I'd like to to say thank you again to Dassault Aviation, who provided a lovely testimonial for their Aluminum manifold processed with Extrude Hone solution.





Siddhartha Sirdeshpande

So, that's how it is.

BB

Okay, now, I'd like you to comment on the relationship with Extrude Hone, what went well, and what must be improved, for example, because we know not everything is always smooth and easy.

Siddhartha Sirdeshpande

So, yeah, basically, as you told me when you make the cost comparison, many ECM solutions are available. I'm specifically talking about the Indian perspective. In India, a lot of other ECM machines are available, and those are, I would say, about 20 percent of the cost of your machines, right?

So, and it is not that every, and the quality of those machines, if I say, okay, maybe the safety side, it has more compromise in some areas. Still, the quality, wherever you have specific tolerances on the deburring, then it becomes more complicated for the other manufacturers to pitch in. But, in most cases, eight out of 10 will call only for the simple deburring. It will not ask for any specific dimension on the deburring. It should be a clean, clean hole where there should not be any detachable work. So, to that extent, the other machines can also meet that requirement in terms of quality.

Now comes only the two cases out of 10 where the specific complex requirements are there that I need a specific radius to be formed. In that case, I could not find a solution at present, but there are many

people, in many ways I introduced this machine to a key OEM I worked for, and there are two, or three other

manufacturers who came and discussed with me that we also have the machines and there are, people are coming up every, every year. So, when I started this, it was only two. Now I think we have five or six. Manufacturers in India who manufacture the ECM machines. So, I'm not saying technically how it is compared to this thing. I'm seeing from the user's perspective, that there is a chance that if I'm not seeing a complex drawing requirement, then people may tend to go to the others.

So that is one area. So, you need to hard pitch from the OEM side, particularly in aerospace, where the requirements will be complex. So, it will make the Extrude Hone's ability to deal with complex requirements the solution.

When it comes to automotive. Maybe you can look for a simpler solution, developing more cost-competitive machines and make them in India to penetrate Indian market. That is one thing. The second area we are working on is tooling because of the tools. In the automotive segment, automotive is very cost-competitive regarding the cost per component tooling. So even if I have invested in the machine one time, looking at the long-term perspective, because this machine can be used for seven or eight years, but then the tooling cost, if it is more than that, becomes nonworkable for the automotive industry.

In that area, you can work out how to develop your tooling manufactured in India because you can develop good tools for all your demands in India and then sell it from here to outside. So maybe in the Indian market, you will be able to capture more because then you will be very competitive in the tooling cost, which I could not find initially. And then that was one of the reasons that my tool cost on Extrude Hone was high. That area, I feel, can be addressed by Extrude Hone India, and then it can be managed because your technology team or engineering team can be shared. Still, you can have a small manufacturing setup in India to manufacture those electrodes, the anodes, and the cathodes.

And then, from make in India, you can serve in India also, and you can export also. So those things will help you, uh, capture more business in the automotive segment in this area.

BB

Regarding the India team, we have invested in the team to grow our local business. A few months back, I was at Holzgünz in Germany, and three colleagues from India were there to study. They did hands-on work on the cathode design and on the machine itself. So, we ramp up as much as possible and reinforce the ECM India team's knowledge. We give them this ability to design and build locally because otherwise, we could not be competitive.

Regarding aerospace in India, while joining Debnath and the Indian team during the Bangalore Air Show in 2019, we met some VIPs from key OEM's. They came to a booth for a few minutes to check the Dassault application.

We were pushing at that time, considering whether you would move to aerospace. We had a solution for you because we knew the day would come.

Regarding manufacturing capabilities, we usually do this in-house, especially regarding tooling and cathodes.

Very fine machining is also required for cathodes because the more precise your tool, the more accurate the result and the higher the quality.

It's not the case internally yet in India. So, we need to find the right partners.

Siddhartha Sirdeshpande

Manufacturing in my country is not an issue!

BB

I'm sure, yes. We need support because we cannot always do everything ourselves. ECM has always been tricky because the ECM knowledge, application, installation, and solution all go back to the tooling.

The machine itself. Okay. Well, tooling is really where knowledge is critical. We also need to protect our intellectual property by trying to do this as much as possible in-house, like for cathodes.

Returning to your Aerospace projects, where exactly does this stand with Safran? Did you produce some parts?

Siddhartha Sirdeshpande

Yeah, I did; I made three parts and then another production batch. I completed the tooling development.

Two parts, then the cut section, resulted in almost 90 percent good work. Some minor tweaks needed to be done, and then a consecutive batch of the five parts. Out of that, we will share two parts that were sent to Safran for their testing. It may take about six to eight months to do that.

I introduced this to the Safran team when they came for the Aerospace project. I brought them to my plant at that time. Then, show them your machine running for complex parts and then those things. So, I have already given the idea; it will be, first, the quality that will be 100 percent, and second, the speed requirement by doing more into the machine program controlled and then tool control. So, you will not have the variation because of the human skill and dependency on human skill will be less. So those things are already done. So, they are quite positive about that thing. Only thing. Like it may take some time for, uh, them to get the approval and all this thing is the first part on this thing.

BB

That’s the beauty of a large Aerospace organization; it takes time to get things certified.

Sometimes, the lack of knowledge or fading in-house knowledge dwarfs the confidence on the customer’s side. They undoubtedly have fantastic engineers, but it slows the adoption if they don't know about a specific technology or feel comfortable with it, even if they are great engineers. In addition, for some, it’s about introducing a new technology that is not mainstream and comes with unknown risks and cost uncertainty. We sometimes have a hard educational job to achieve.

Siddhartha Sirdeshpande

Yeah. In one company I worked for, I could bring ECM technology to Aerospace. I only pushed it because I was using it in automotive. Otherwise, before me, the other gentleman was there was not pushing it because he was not aware of the ECM. So, unless the top person knows the ECM process, you can’t drive it and push it.

So that was the thing because since I was using it in automotive, I was. And then, actually, I pushed. I did not have the DASSAULT reference so that I could push for Safran. Somehow, I needed to push hard to get into aerospace because, in India, employee attrition is also a big issue because it's a growing economy, and then people are completely accompanied. It's like people will get trained and move to other locations.

So, that is also one of the areas where it's challenging for us to retain that talent. One area could be if I make that talent more specific to the machine to train more people on that machine. I can train more people on the machine instead of skill. So, it will be more into the engineers who can get trained in that.

The manual scale is a very tough challenge I'm facing today to retain those people. That was the reason I was pushing for an easy machine.

BB

That's also challenging: the human, convincing people, retaining people, and training people. Do you have the need internally to provide ECM knowledge to these people? I'm sure you have covered this with Debnath, but I think we would also welcome having customer employees come to Holzgünz to gain more technological knowledge.

Siddhartha Sirdeshpande

I mean, yeah, I mean, that's good; Mr. Debnath and his team are also coming to their customers, so for any technical assistance, their team and your team can work together and do it. Of course, if you are in Bangalore, it's easy. It's also easy logistically. So, I treat Extrude Hone India as one of my extended arms. So, then it is, it's not an issue for me regarding getting training.

We have resolved the specific technical issue. Later, I had to develop four variants of gasoline direct injection pumps, and we developed the fixture for the same machines. So, fixtures also come from the India team—your Indian team. So, I get good support from them. It's not an issue at all. I have a good relationship with Debnath.

BB

So that's not a surprise; I have a good relationship with them. Debnath is more than a colleague. He's a lovely friend, and we work together a lot. I think it's my most collaborative colleague regarding blog post customer stories support. Yeah, it's a great person and a great local team. A strong team, and we keep reinforcing it.

Siddhartha Sirdeshpande

If he starts manufacturing the tooling in India, it will be an advantage for Debnath to penetrate the market more because then he can teach it in terms of cost per component instead of the cost per machine. You cannot compare the machine cost with any local manufacturing company. It's not possible. But when it comes to cost per component and the productivity level, see, it doesn't matter because even if your machine is 70% more expensive than the others, if your machine's productivity is 60% higher. Then you have the tool cost per component; your tool life is 50 percent higher than the others. Then, on the automotive side, it doesn't matter because it is a one-time investment, but your cost per component will be far lower. So that is where I think Extrude Hone can pitch in and get more into this.

BB

I appreciate the feedback because it is important to us. Yes, there are things we can do here, so we have room for improvement. Now, thanks to customers who also support us like you do. This is how we can learn what makes sense for us, what we could do better, and how we must improve.

Thanks a lot. You have shared a lot already. Thank you very much for your time; I appreciate this. I love doing this because it is very, very interesting. Every time we discuss this with a customer, we learn to be even better.

Do you have anything else you would like to add that could be included in this interview testimonial? Is anything popping up in your mind?

Siddhartha Sirdeshpande

The only last thing I already discussed is that on a 0 to 10 scale, 10 being the best, Extrude Hone's quality is at 9. But, regarding cost, you need to make it more competitive, particularly in the Indian and South Asian markets.

That will be an excellent opportunity for them both, not so that he can have this India center as in South Asia distribution and manufacturing now. That would be a great future. I think this is the best future, and I wish you the best of luck with your technology.

BB

Thank you for sharing your strong, seasoned senior industry expertise with this highlight on ECM technology adoption. At Extrude Hone, we look forward to continuing to support you.

About Extrude Hone.

Extrude Hone® serves customers in many market segments, including automotive, aerospace, heavy industry, medical, and general engineering. From engineering to fully automated solutions, Extrude Hone supports its customers with edge blending, shaping, precise flow-tuning, and surface finishing solutions through its engineered processes and state-of-the-art finishing technologies, delivering ultimate added value and improving productivity and quality.

Extrude Hone offers customers access to AFM (Abrasive Flow Machining), ECM (Electrochemical Machining), ECM Dynamic, and TEM (Thermal Energy Method) via our Technical Centers and Center of Excellence, ensuring our presence during all of the most critical feasibility tests and demonstrations – from the early design phases by producing small batches of components for prototyping through testing and supporting the ramping stage in our contract shops prior to the final delivery of state-of-the-art equipment. Our company offers first-class service around the world.

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