



WHAT DOES THIS
BATON HAVE
TO DO WITH
AUTOMATION?

“

Conducting an orchestra means bringing together lots of brains, hearts and instruments. The musicians know their notes and I know mine – and naturally I am very skilled at setting the pace. But is that enough? It's not enough. If you want to bring a symphonic piece to life you have to penetrate deep into the depths of the composition; work out the details; create connections between the instruments, and communicate it all with the musicians. You have to say a thousand things that words can't describe. You rehearse until you have it off pat. Notes are transformed into feelings. Then, and only then, does an orchestral sound emerge that will capture the audience.

”

IT'S ABOUT PROPER ORCHESTRATION.



Fabmatics automates **material flows** in semiconductor factories. While the machines in such factories are usually state-of-the-art, that often doesn't apply to the internal **transport, storage** and **handling** of the substrates. There are historical reasons for this: older factories are seldom cast from a single mold. As a result, the production and material flow do not blend perfectly – a deficiency in today's global competition. Subsequent automation can be responsible for great efficiency gains here.

Material flow automation is a challenging orchestration. The conditions are different in every factory. Preconceived methods and products alone are not enough to get the job

done. But who has the „compositional diversity“ to implement the best individual solution in each case?

Fabmatics is nearly the only company in the world to offer **integrated system solutions** for material flow automation from a single source. This is not by chance: Fabmatics was created from the merger of HAP and Roth & Rau - Ortner, two companies with more than 25 years of experience in this field. Both companies are from Dresden. That is crucial, because the city, with its internationally recognized semiconductor production, has been known for years as the premier digital location in Europe. These conditions are ideal for Fabmatics to exist in the global market.

AS PERFECT AS IT CAN POSSIBLY BE.

Only when material flows are automated does production truly become efficient.



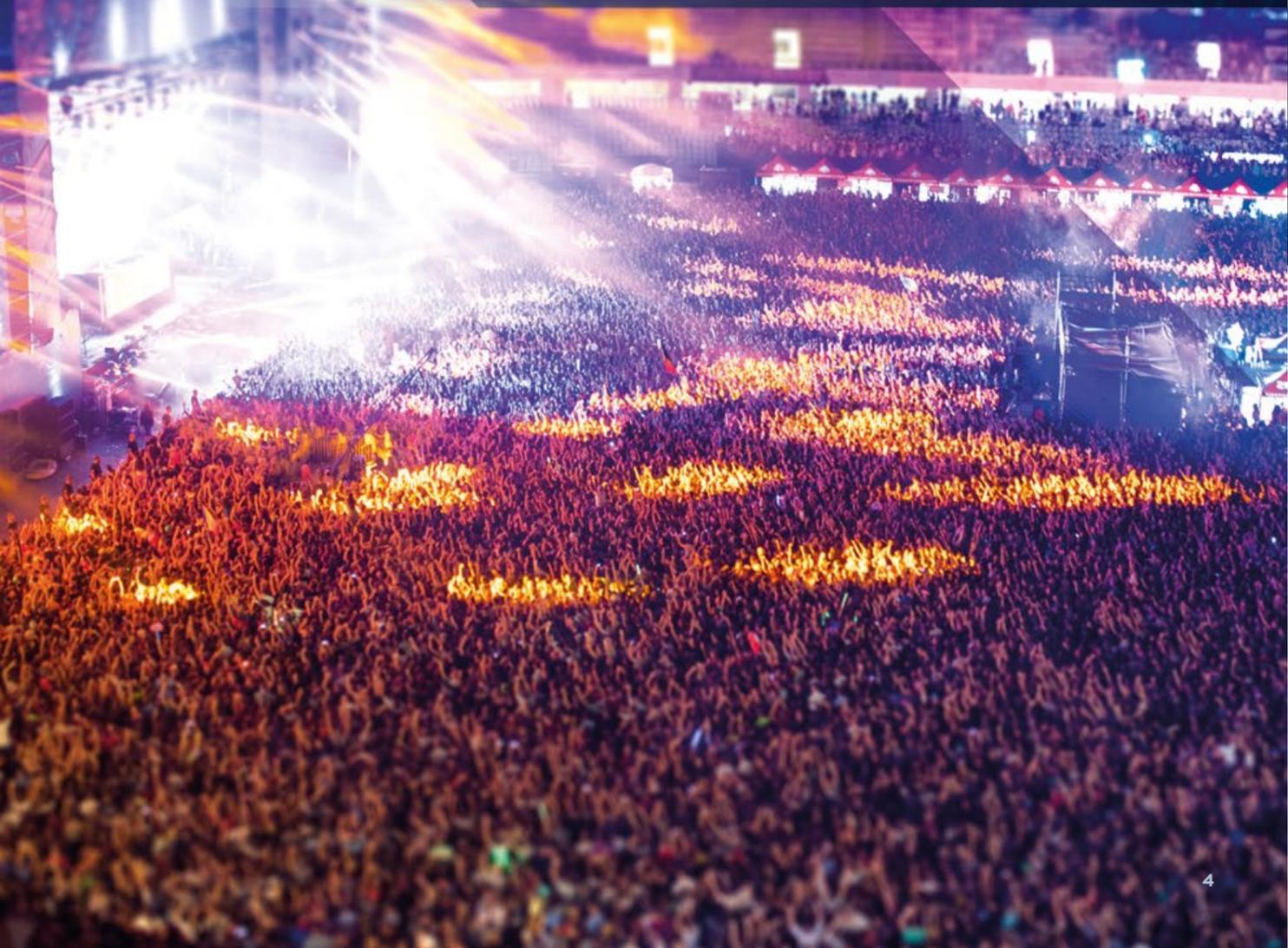
“

In order to organize a heavy metal festival you obviously have to like the music. Above all however, you have to understand structure. Do heavy metal and structure go together? Of course they do. When over 80,000 people get together you have to come up with something, because they will be in perpetual motion: from the parking lot to the en-

trances, exits and emergency routes. You'll need reliable timelines and various scenarios, thunderstorms included. You'll also need modern security, catering and sanitary facilities. That being said, heavy metal itself is structure. Or do you think those boys could achieve their sound without a basic musical framework?

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NO PUSHING,
NO SHOVING, NO CHAOS.



JUST A SMOOTH FLOW.

Production structures that have grown over time turn the automation of semiconductor factories into a challenge.

Older semiconductor plants of the 200mm generation present material flow automation with the most challenging tasks conceivable. Full **tracking** of production batches, **elimination of defects** caused by manual handling, reduction of **throughput times** – these are the essential factors. But how can one automate productions that have grown over time? Lack of space, disadvantageously arranged systems and non-standardized load ports often turn the task into a Gordian knot.

Fabmatics cuts through it: with **customized automation solutions** that effect demonstrable increases in efficiency. Regardless of how specialized the conditions are – Fabmatics can master even the most individualized challenges with integrated services and experience. The successful automation of complete 200mm factories of large chip manufacturers in central and southern Germany proves it. Projects like these have become Fabmatics' blueprints for many possible automation projects all around the world.

“

Technical aids can neither replace musical ideas nor skill. However, if you have these two components, you can add technology to create something completely new. I absolutely love the mix of earthy blues and electronics. On the one hand, it's supposed to sound like Alvin Lee with his Gibson. On the other hand, computer loops can be created that simply sound extraterrestrial. For me, the two together are unbeatable. And they do go together, because once they've been programmed the loops can even be brought on stage. My colleague the computer and I are the perfect duo.

”

EXPERIENCES WANT
TO BE PROCESSED.



Identification and **localization, transport, handling** and **storage** – these are the sub-fields of material flow automation. Despite their individualized nature, solutions follow certain basic patterns. That's why Fabmatics has developed basic solutions for all sub-fields. They are modular, capable of integration in specified interfaces and always have the overall system in mind, providing for optimization of time and costs.

A prerequisite for any material flow automation is the full, unique identification of components and product containers on the basis of **Indoor-GPS** or **RFID**. Transport and the connection to the machine level takes place with **conveyor systems** and **lift systems** installed under the clean room ceiling.

Fabmatics has developed both **stationary robot cells** as well as rail-mounted and self-navigating **mobile robots** for handling containers, wafers and masks. They perform the transfer from the transport system to the load ports of the machines. They sort, organize and identify. **Storage systems** for installation under the ceiling have also been created.

In addition, Fabmatics has developed a **software framework** that enables both the system control of in-house systems as well as the connection to higher level factory control software, via standardized interfaces.

The solutions conform to **clean room class ISO3/FED1**. In handling specialized substrates within processing systems, Fabmatics achieves the **ISO1 standard**.

PREFERABLY TOWARDS
EFFECTIVE INSTRUMENTS.

HERO® FAB,
a free-moving robot for
complex transport, loading and
unloading tasks. It interacts
with people and has a
high load capacity.



PLAN EVERY STEP WELL AND ACTUALLY TAKE EACH ONE.

“

There are piano teachers these days who start in the middle. Their motto: here is a song that you know, and because you know it, you will also soon be able to play it. Like a parrot that imitates the words people say. You'll never master Bach and Chopin that way. I do things classically: notes, a key-

board, correct posture, fingering, scales and chords. Only then is it time for the composition. The right sequence is important. And it trains patience, which is just as important as talent. When it comes to playing the piano, experience of success isn't simply around the corner.

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THIS IS HOW SOMETHING SPECIAL IS CREATED.



Six project stages – all from Fabmatics

1. Feasibility study for automation solution
2. Overall concept
3. Configuration / instrumentation of transport, transfer and storage systems
4. Software configuration
5. Installation and commissioning
6. After sales service

Intensive collaboration with the customer during the entire project is one of Fabmatics' factors for success.

An automation project often begins with a **feasibility study**. It also includes statements on time required and cost. The experts from Fabmatics slip into the role of their customers, so to speak. This makes it easier to find the most economically favorable decision in this highly specific and complex material.

A detailed **implementation concept** is then developed. It ensures that solutions for individual areas are implemented gradually so that the automation can occur to a certain extent during **ongoing production**.

This is followed by the technical implementation in hardware and software. Fabmatics

has its own **engineering** and operates with high vertical range of manufacture. The solutions are developed completely in-house and predominantly manufactured in our own 2,000m² production facilities including a 500m² clean room. As far as the technological components are concerned, such as robotics, but also drive and control technology, the specialists are continually watching the market.

Installation and commissioning on-site is also performed by Fabmatics. **After sales service** includes a global hotline and remote maintenance – if the customer wishes. A personal team of specialists is also available in Europe and the USA. In the case of a corresponding agreement, they can be on-site within a few hours.

WHEN YOU CONSTANTLY DIVERSIFY WHAT YOU KNOW,

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I've been a classic ballet dancer since I was six years old and now I really have skills. I've danced the Nutcracker Suite and The Firebird too. But today, I enter a new world: a competition of styles. Who will be my partner? A break-dancer from New York? A Passinho dancer from Rio? The decision is

made by a draw. What will happen to my pirouettes when they add their insanely fast acrobatics? Maybe the DJ will play a Viennese Waltz and we'll both have to manage. I am stepping beyond my limits and I'm super excited about it. It's pure life.

”



YOU'LL ALSO DARE TO TRY SOMETHING NEW.



Material flow automation for industries with high cleanliness requirements

- Semiconductor industry
- Electronics production
- Large laboratories
- Medical device manufacturing
- Optical industry
- Pharmaceutical industry
- Photovoltaic manufacturing

There is need for automation of material flows in many industries – including the optical industry.

Fabmatics' extensive expert knowledge is also of benefit when it comes to **300mm factories**: among other things, they are offered transport and robotics solutions for production, testing and inspection tasks in special areas of the factory.

Customer-specific specialized products are also created with clean room requirements in mind. For example, Fabmatics produces a high resolution **inspection tool** that instantly detects the smallest defects in semiconductor masks, and is continually developing it further together with customers. It has also

created a **purge system** for FOUPs. It flushes the wafer transport container with inert gas during intermediate storage, protecting the sensitive silicon wafers from contact with moisture and harmful gases.

With such specialized know-how, Fabmatics also tackles challenging material flow automation tasks in other industries. Such widely varying products such as **circuit boards, sample carriers, micro parts, glass substrates** or **packaging** can be transported, handled and stored, for example.

“

Playing with musicians that you have never seen in your life – this is the icing on the cake. Suddenly you experience what music really is: a magical force that connects people and effortlessly overcomes all boundaries. People simply understand each other. I have no idea what the name of the guy

is playing saxophone. I can't even speak French or German. But I'm listening to how he just repeated his last phrase, the one I'd love to pick up on - a second time, quieter - and it sounds like a bridge. Now I have eye contact with him – this is the moment – and I tune in with my trumpet.

”

A COMMUNITY OF PERSONALITIES:



Fabmatics is a **medium-sized company** – with all the advantages that come from the simple organizational structure of such a company type. Highly talented specialists feel at home here. On the one hand, they can develop as individuals. On the other hand, they are part of a true **cooperation**. Another advantage of this structure is that it allows for uncomplicated, direct contact between departments. This is the only way that exceptional solutions are created from a single source.

Fabmatics is owner-managed. **Dr. Steffen Pollack**, former co-founder of HAP, and **Heinz Martin Esser**, previously the CEO of Roth & Rau - Ortner, represent that mix of peak-level technical and management expertise that is among the success factors of many German technology companies.

The company operates **worldwide** and currently employs about 170 people at its headquarters in Dresden and its US subsidiary in Sandy, Utah.

Fabmatics is permanently anchored in the research landscape of the microelectronics location of Dresden, as part of the **Silicon Saxony** expertise network. It has long enjoyed an international reputation. However, the company also gives back what it receives in incentives. For example, it actively supports youth projects such as **TURAG**, the robotics workgroup of the Technical University of Dresden. This also promotes the company's own development of up-and-coming talent.

THAT'S WHAT MAKES A TEAM.

Teamwork in practice at Fabmatics – including outside the office and production.



A PROPER ORCHESTRATION – THE SECRET TO A COLLECTIVE **PEAK** PERFORMANCE



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