DANIEL KURR

The perfect material flow

How can a high variety of parts be mastered without a lot of effort? DAX MetallForm brings an intelligent material flow solution from TRUMPF with an automated guided vehicle (AGV) into the company. The result: more transparency, faster throughput times and greater overall efficiency.

Around 11,000 parts pass through the production facility of DAX MetallForm every week. The company, based in Cochem, Rhineland-Palatinate, manufactures large-format machine cladding and frames as well as an abundance of associated individual parts. And they are so successful at this that the existing processes are reaching their limits. In particular, the time-consuming handling of the many small parts slows down production. However, the idea of optimizing the material flow solely with the help of an automated large-scale storage system is not enough for Managing Director Frank Schmitz: "The large-scale storage concept as a stand-alone solution does not convince me. In my view, complete dependence on it restricts our flexibility too much."

When searching for a solution, Schmitz turned to TRUMPF: "We've had very good experiences with laser and bending machines, TRUMPF's consulting and service over many years, and we weren't disappointed this time either." The store experts from TRUMPF Sales suggested that he introduce separate automation for the area in addition to the large-scale storage system with the new intralogistics solution TruTops Fab Logistic. Schmitz listened up: "That was exactly in line with our ideas and tipped the scales in favor of TRUMPF's coherent, holistic solution."

Little effort with the masses

Since Helene Dax took over the management of the family business in 1998, the company, which was originally active in metal construction and sheet metal processing, has developed into a full-service provider in the sheet metal sector. Intro, which is part of the company group, offers customers support in machine concept development, design and assembly. Helene Dax summarizes, "Today, we offer the entire manufacturing chain - from metal sheets to fully assembled parts."

The customer base includes machine builders from a wide range of industries who benefit from the know-how and experience of the specialists from Cochem, who are as passionate about technology as they are design-oriented. Schmitz explains: "One of our strengths is the design of enclosures with a host of variants. We design them in such a way that batch size effects can be exploited in production. This reduces effort and therefore costs, and of course our customers appreciate

that."

The Cochem-based company is therefore taking advantage of the expansion of production to what is now 9,000 square meters to create the conditions for installing the TRUMPF total solution. Helene Dax explains, "Small parts cost money and require work without us earning a great deal from them. That's why we want to invest as little effort as possible in them." Since the beginning of 2020, DAX has been using a large-scale storage system, to which TRUMPF's TruLaser fiber 3040 is currently connected. The material flow from the store to the laser systems is based on production data. This data is stored in the TruTops Fab production control software. In addition, the new intralogistics solution TruTops Fab Logistic and a connected automated guided vehicle system from Jungheinrich handle the material flow outside the storage system. For the first time, the software also makes it possible to connect machines, areas and workstations outside the large-scale storage system to the automated material flow.

Around 11,000 parts go through the production at DAX every week. 80 percent of these are small parts that can be transported on load carriers. Thanks to TRUMPF's intralogistics solution, DAX benefits from both automated planning and automated parts transport. (Foto: Cornelius Bierer)

With the help of the intuitive interface of TruTops Fab Logistic, workers can check orders in and out using tablets, even on the shop floor. When an order is reported as completed, TruTops Fab automatically generates a transport order for the automated guided vehicle system. (Foto: Cornelius Bierer)

To be able to offer customers a complete solution from a single source, TRUMPF brought a competent partner on board in the form of logistics specialist Jungheinrich. The ERC 213a transport system is connected to TruTops Fab through an interface and handles up to 22 transports per hour. (Foto: Cornelisu Bierer)

In 1998, Helene Dax took over the management of the family business. Since that time, DAX MetallForm has developed into a full-service provider in the sheet metal sector. DAX supplies machine builders in a wide range of industries with individual parts, components and systems made of steel, stainless steel and aluminum. (Foto: Cornelius Bierer)

Connection between analog and digital

Manuel Schwestka, Product Manager at TRUMPF, explains, "Our system docks directly into the production plan in our TruTops Fab software. While machine operators often had to worry about material provision and transport in the past, this extra effort is no longer necessary." The planning of material movement is fully automated. It is optimized in terms of route and time and takes prioritization into account. Since the system reacts flexibly to spontaneous changes in the production sequence and dynamically reschedules transports, the proportion of unproductive down times and transport times is reduced.

In the production sequence at a laser cutting machine, the user can now place any parts on a barcoded pallet. On an intuitive software interface on a PC or tablet, the worker "marries" the manufactured parts to the pallet using a barcode scanner. He then pushes them into a docking station. This intelligent storage station uses sensors to recognize the pallet and reports the material receipt directly to TruTops Fab. The software checks to which machine the material must be transported for further processing according to the production plan. It also checks what priority the transport has and whether there is any free space at the corresponding docking station. TruTops Fab then issues a transport order and sends it to the control system of the Jungheinrich automated guided vehicle. In addition to the advantages of automated planning, customers also benefit from automated parts transport.

Manuel Schwestka explains, "The charming thing about our solution is that the transport order can also be assigned to a worker with a pallet jack or a forklift, depending on the customer's requirements and automation needs. A mixed operation like the one at DAX is also possible. Standard tasks and the transport of small parts are handled by the AGV, while large parts are still transported by personnel.

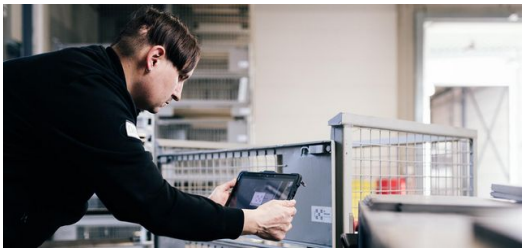
Small parts cost money and require work without us earning a great deal from them. That's why we want to invest as little effort as possible in them.

Helene Dax, Managing Director DAX MetallForm GmbH & Co. KG

Partners at our level

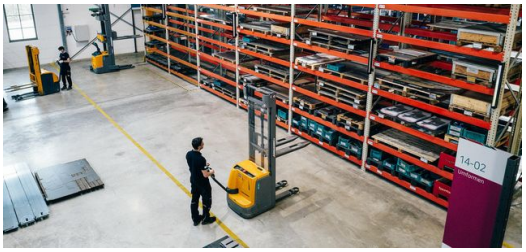
DAX has an AGV in operation: the ERC 213a from Jungheinrich. The robust helper handles up to 22 transports per hour and is so compact that it can transport pallets even within the smallest of spaces. A 2.8 kW three-phase AC motor ensures constant power, and the electrically controlled, powerful lifting motor ensures smooth, quiet lifting and lowering of the load carriers. Thanks to modern lithium-ion technology and automatic intermediate charging, the ERC 213a has particularly high availability. Extensive safety sensors also ensure maximum safety in the manned DAX production unit.

Schwestka: "As a solution provider, we supply our customers with hardware, software and service from a single source. Since self-driving vehicles are not part of our portfolio, we were looking for a partner whose vehicles could be integrated into our material flow concept. The choice fell on Hamburg-based intralogistics specialist Jungheinrich because we are on the same wavelength when it comes to quality and service standards." With this partnership, customers benefit from TRUMPF's expertise and experience in sheet metal processing and Jungheinrich's innovative intralogistics solutions. But they only have one contact: TRUMPF. Frank Schmitz appreciates this: "In order to introduce such a process, it is necessary to conduct a comprehensive material flow analysis. With the TRUMPF experts, we had sparring partners who understand what is at stake in all this. They were partners at our level."



Using an intuitive software interface on a PC or tablet, the worker "marries" manufactured parts to a load carrier using a barcode scanner. (Foto: Cornelius Bierer)

Sensors at the docking station detect when a pallet or pallet cage is parked and report this directly to TRUMPF's TruTops Fab software, which then takes over the automatic transport control. (Foto: Cornelius Bierer)



DAX has a buffer storage system with 42 spaces. Here, the automated guided vehicle system stores orders that TruTops Fab has not yet released for further processing. Only when sufficient space is available at the next workstation is the next transport process at the store triggered. (Foto: Cornelius Bierer)

Frank Schmitz, Managing Partner of DAX MetallForm, is optimistic about the future: "I'm sure that with TRUMPF's intelligent intralogistics solution, we can achieve our goal of reducing setup times by 20 percent and throughput times by about 25 percent." (Foto: Cornelius Bierer)

Everything in flow

DAX currently has five docking stations installed, as well as a buffer storage system with 42 pallet spaces. The automated guided vehicle system serves two bending machines as well as manual workstations for drilling, tapping and grinding. Helene Dax explains, "The AGV operates on one main aisle. We had already provided for the necessary transport route in the new construction, as well as sufficient space for the docking stations directly at the machines and workstations." Frank Schmitz adds, "In TruTops Fab production planning, we can now specify, for example, one of the bending machines for processing thick material and one for bending thin material. The systems are then automatically supplied with the appropriate material regardless of the order. This eliminates some setup times and shortens throughput times without us losing track of the parts."

What's more, TRUMPF also has a solution for manual workstations. While checking pallets in and out at the docking stations is automatic and reported to TruTops Fab, the manual workstations are integrated into the automatic material flow using a digital assistant called a Workmate. Schwestka: "With the Workmate application on a tablet, manual workstations, as well as older systems or third-party machines, can be easily linked into the production plan from TruTops Fab."

25 percent shorter throughput times

Around 80 percent of the parts at DAX fit on pallets and will thus be automatically routed through the entire production process in the future. As a result, the workers only have to concentrate on the large parts, which they move with the forklift. Frank Schmitz is satisfied: "It has already become clear that the combined solution from TRUMPF is just right for us. I'm sure that it will enable us to achieve the targeted 20 percent reduction in setup times and around 25 percent lower throughput times."

As soon as the entire production is transferred to the new process, Helene Dax and Frank Schmitz also want to fully digitalize the welding and assembly areas. "And then," says Helene Dax, "we will also need more docking stations and a second automated guided vehicle. Fortunately, TRUMPF's material flow concept is so flexible that it can be adapted to our needs at any time."

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