

A Long Storage System for Short Distances

STOPA UNIVERSAL sheet metal storage system with high turnover capacity





By investing in a STOPA UNIVERSAL automatic sheet metal storage system with a length of just over 100 meters, Schickling is now benefiting from short distances to its laser-cutting and stamping equipment, a closed process chain, low-manpower workflows and higher productivity. In addition, the sheet metal processing company can store more material as a buffer, allowing it to buy at better terms.

Hermann Schickling, Managing Director of H. Schickling GmbH Maschinenbau in Visbek, Germany, demonstrates the machine: when he presses a button on the control console of the laser cutting unit, it executes the pre-programmed processing order. "Now everything follows automatically. The control unit commands the storage system to retrieve the required sheets. The storage and retrieval unit takes the system pallet from the rack and transfers it to the transport car. The car then travels to the loading position where the loading component, which continuously supplies the laser-cutting machine with metal sheets, is waiting."

More than 40 tonnes of material per day

The automated solution, which went into operation in summer 2010 and handles 40 to 45 tonnes of material every day, has already become indispensable, not least because all the sheets are processed by the STOPA UNIVERSAL System, supplied by STOPA Anlagenbau GmbH in Achern-Gamshurst, Germany. The

system operates around the clock on five days a week and until noon on Saturdays. After that, three or four machines, monitored by a small number of employees, continue operating until Monday morning. But the system has by no means reached its limit; the company, which is set for continued growth, is currently using only about half of the available storage volume.

Continuing the tour of the new building, Hermann Schickling climbs up to a gallery: "From here you can see how the storage system is integrated into our production operations, and how important its role is. With its high traversing speed of up to 150 meters per minute, the storage and retrieval unit is able to supply material, with perfect timing, to the laser-cutting and stamping equipment and to remove waste metal."

Good business was what motivated the company to invest in the automatic sheet metal storage system, purchase additional machines and operate them along with the old ones. "Without a central warehouse, we'd have had to break up our pro-

cess chain," explains Schickling. "We can now manufacture more productively, flexibly and economically. That's because we're able to return sheets to storage, operate with low staffing levels and keep larger quantities of materials in storage ready for machining. This is an advantage that allows us to secure lower purchase prices." Moreover, the STOPA UNIVERSAL system allows the company to limit its use of fork-lift trucks to the handling of incoming goods and the transport of finished parts. Previously, fork lifters supplied sheets to the machines too and put sheets into interim storage in old shelving, often causing damage to the material.

Wide range of machinery

The storage system, which mainly holds galvanized sheets with thicknesses of 0.5 to 20 mm, is linked to seven flat-bed laser machines and three combined laser-cutting and stamping machines made by TRUMPF, all located close by and allowing quick access. Hermann Schickling stops between two stations: "Depending on the size of the working area available to the given handling component, STOPA installed parallel loading and unloading cars or double cars arranged one above the other, including contour checking points. The lower car in a double car station delivers material, and the upper car returns lasered parts to storage. All of the transport cars operate during the machining time and without personnel." Two of the stations that supply dual-function machines additionally have a spreader magnet unit on their scissor lift tables, which serve as loading cars. These spreader magnets ensure reliable separation of the sheets. The transport cars used for unloading have rotary encoders for exact positioning. In addition, the last sheet is detected automatically at each loading station.



At this station, owing to the larger working area of the handling component, Schickling uses loading and unloading cars that move in parallel.

Hermann Schickling points out a special feature of the automated solution: "In March 2011 we linked the TruLaser 5030 fiber flat-bed laser machine directly to the storage system via a LiftMaster compact machine. Part of the handling component is even incorporated into a storage tower that STOPA rebuilt for this purpose. That eliminated even the short travel distance from the storage system to the processing machine."

The input/output stations too have a scissor lift table equipped with loading pins and insertable stops for setting up a corner coordinate system, allowing precise alignment of the sheets. A fork lifter retrieves material from an unpacking table which likewise has pins. These can be moved to fit any of the wooden pallets used as load carriers in truck transport.

The automatic storage system also includes five stations used solely for storage and retrieval. Their scissor lift tables have recesses in the bottom front area. Hermann Schickling asks an employee to move the outriggers of a forklift truck into the recesses while at the same time inserting the raised fork entry shoes into the openings of a Euro pallet resting on the lift table. "This solution allows us to move the forklift truck right up to the table. It's essential when we have to lift Euro pallets loaded with sheet metal parts from a system pallet and, say, transport them to folding presses in an adjacent building." In order to make even better use of the

The company

Schickling Maschinenbau GmbH: top-quality metal construction

Founded in 1988, the sheet metal working company Schickling Maschinenbau GmbH in Visbek, Germany, specializes in laser cutting, bending, deep drawing, welding and machining. The company jointly develops with its customers parts that are optimized for functionality and cost-effectiveness. Its services range from simple cutting-to-size of parts to the completion of complex assemblies made of different materials. Surface treatment is offered as an option.

As a sheet metal specialist, the company has enjoyed steady growth for years, and therefore makes regular investments in advanced production methods. It processes steel in many grades for products such as stable equipment, waste disposal vehicles, storage and conveyor systems, office furniture and heating systems, in addition to making parts for medical and laboratory equipment. Schickling, which has some 250 full-time employees and up to 30 temporary employees, also produces high-quality stainless steel grills for outdoor use under its own EdelDesign brand.

storage system's flexibility, the company uses pedestals for storing blank sheets of different grades as well as cut and folded semi-finished products.

Efficiency through automation

The STOPA UNIVERSAL storage system is 107.5 m long, 9.5 m high and 5.2 m wide. It has 1,464 storage positions in 56 storage towers, arranged in double rows on an aisle. Material on the top level can be stored at up to four times the loading height. The system currently contains 480 flat pallets each with a surface area of 1,525 x 3,050 mm. The load carriers hold large and medium-sized sheets up to a full payload of 3,000 kg. If an operator returns metal sheets or semi-finished products to the store which are not securely res-

ting on at least two longitudinal pallet sections, or if mesh boxes are put in storage, perforated floor plates must be placed on the system pallets.

The robust two-mast storage and re-



At this station, the handling component always picks up the material and sets it down in the same position. STOPA therefore installed double cars that move one above the other for storage and retrieval, saving space

trieval unit operates with a fork which telescopes on both sides. A digital travel measuring system ensures exact longitudinal positioning. An additional absolute and load-independent travel measuring system permits precise vertical positioning without having to move to a reference point. Data are transmitted to the storage and retrieval unit via a light barrier without any physical contact. STOPA supplies power via an overhead bus bar to ensure low-wear and low-noise operation. A weighing unit in the lifting beam records the weight of items placed in storage or returned to storage, and the system checks the contours of sheets being returned for whether they protrude over the side of the pallet.

The STOPA UNIVERSAL storage system at Schickling is designed for



The STOPA UNIVERSAL storage system, which is integrated into Schickling's production facility, supplies material to all of the operator's laser-cutting and stamping equipment with perfect timing.



The scissor lift table at the input/output station is equipped with loading pins and insertable stops for setting up a corner coordinate system, allowing precise alignment of the sheets.

maximum loading heights of 130, 410 and 970 mm. For safety, the company uses an automatic collision control system to monitor the contents of storage locations below and above a selected location. Free spaces without any restrictions are filled using a dynamic (chaotic) storage management. Mesh boxes, which must go to the top level, are an exception. When items are retrieved from storage, the control unit ensures by means of a light barrier that the permissible loading height of the respective transport car or scissor lift table is not exceeded.

A real-time soft PLC controls the storage system's components. An in-

dustrial PC incorporated in the PLC is used to operate the system and display its status. The control system communicates with the warehouse management computer via an interface supplied by STOPA. The computer software continuously manages stocks and sheet metal data, providing thanks to permanent stocktaking a clear picture of the stocks at all times. Easy-to-understand function keys ensure simple operation of the system. A 12-inch TFT screen in the ergonomically designed control panel continuously shows the status of the storage and retrieval unit in a plain text format, and graphically displays the SRU and storage towers. If a fault occurs, STOPA can use the

PC Anywhere remote maintenance software and the modem for system control to analyse and rectify the fault from its own location.

Economical solution

The STOPA UNIVERSAL system makes good economic sense for a simple reason: the service life of the sheet metal warehouse significantly exceeds that of the processing machines linked to it. The system is also more economical because of its shorter material retrieval times, which ensure that the facility can work continuously at full capacity. Schickling has additionally been able to increase its capacity by using low-manpower shifts. Besides this, the company can put more machines to work while operating the storage system without increasing its staff.

The system also enables the operator to simplify order processing and plan orders more easily and exactly. Moreover, production quality is improved because sheets suffer less damage in handling. Another economic benefit arises from a reduction in lead times by about 50 percent. This is because manual chores like searching for material and retrieving it from storage are eliminated thanks to better organization. The STOPA UNIVERSAL system also has a modular structure, allowing it to be extended and adapted to new production environments. What's more, automation enhances work safety. It also consi-



A Schickling employee commands the system to place delivered sheets into storage.



Panoramic view of the STOPA UNIVERSAL storage system at Schickling

derably reduces space requirements without changing the amount of material in storage, because the full height of the building can be put to use.

Mounting units on Schickling's steel structure make the STOPA UNIVERSAL system even more economical. This special solution permits quick and easy instalment of supply lines. Hermann Schickling is visibly pleased: "Besides achieving our economic goals I'm proud to have kept our entire team employed. That was one of our objectives, particularly since a



"Without a central warehouse we'd have had to break up our process chain," explains Schickling as he checks a sheet-metal part.

major reason for investing in the automatic storage facility was our continued growth."

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