



STOPA COMPACT sheet metal storage system reduces handling and raises productivity

WaCo Gerätetechnik GmbH, Dresden, a manufacturer of custom sheet metal parts, assemblies and equipment, has reduced its handling operations and increased its productivity by investing in an automatic STOPA COMPACT sheet metal storage system. Thanks to automation, utilisation of the processing machines linked to the system has risen by up to 30 percent. Delays that were previously caused by additional time-intensive manual work have been eliminated. Another benefit is provided by the very short access times to the sheet metal storage system.

Much better machine utilisation

WaCo opted for STOPA Anlagenbau GmbH because of its experience working with TRUMPF, which manufacturers the processing machines linked to the system. In view of the complex connections between the controllers for the machines and the storage facility, a mastery of the interfaces is essential.

WaCo's decision for the STOPA COMPACT system came

at the time when it was building a new plant. The system solved the company's space problem, which had arisen because the pallet racks in the old building were unable to hold all of the raw material. In fact, many sheets were being stored in the hallway. Moreover, transporting the sheets to the machines and loading and unloading them had become too laborious.

Handling capacity of 800 metric tons

The storage system, which handles 800 metric tons of sheets per year, supplies four processing machines:

a punching machine, a laser-cutting system with automatic loading, and two combined laser-cutting and stamping machines with automatic loading and unloading. In addition, there are three outgoing goods stations through which the company sends sheets for deburring and dressing. Semi-finished parts are sent to laser-cutting facilities in a separate building.

WaCo stores 140 kinds of sheet metal, differing in quality, thickness and material. They include sheet steel, hot-tip galvanised and electroplated steel, nickel-chromium steel, copper sheets and brass sheets. The thicknesses range from 0.3 to 8 millimetres; one to two millimetres are most common. Plastic sheets are also stored.

The process at WaCo begins at the unpacking table,



The storage and retrieval unit achieves speeds of up to 150 metres per minute when travelling, 23 when lifting and 20 when pulling or pushing

The system is roughly 67.5 metres long and consists of 40 blocks arranged in double rows. It has space for 804 storage locations, not counting the stations, and can be extended as needed. The system's flat pallets are designed for medium-sized (1,250 x 2,500 mm) and small (1,000 x 2,000 mm) sheets and for material weighing up to 3,000 kg. The storage system is very flexible. It can work with loading heights of 130, 355, 580 and 805 mm, as well as 1,030 mm when wire mesh boxes are placed on pallets. Sheet stops prevent shifting and make it easier to load the pallets. STOPA also achieves a high degree of space utilisation through close spacing of the shelf dividers. The operator benefits from detailed real-time overviews of stock levels, especially since the control system weighs each pallet that comes in. The same applies to material that is returned to storage.

where stacks of sheets are removed from the pallets. The table has movable plungers that can be adjusted to the dimensions of the wooden pallets. A forklift truck fetches the stacks and takes them to the incoming/outgoing goods station. Here scissor lift tables and transport carts supply and remove sheets during machining time and without personnel. This boosts productivity. Pneumatic centring of the flat pallets on the carts and scissor lift tables is also automatic. Photoelectric sensors make sure that the specified loading heights are not exceeded. STOPA has also provided spreader magnet units on the scissor lift tables at the three stations that supply the dual-function machines and the laser cutting system. The magnets ensure reliable separation of the sheets. In addition, the last sheet is detected automatically at each loading station and the unloading carts of the dual-function machines have rotary encoders which ensure that the punched and laser-cut parts are exactly positioned.

A storage and retrieval unit handles the load carriers

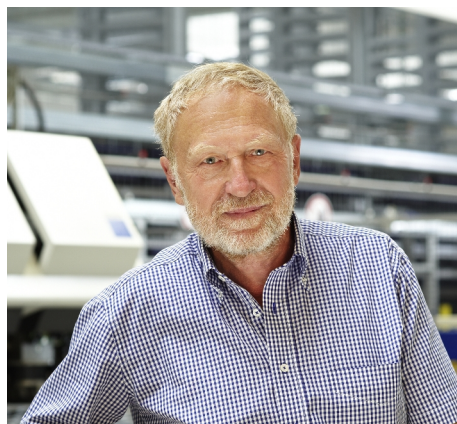
A robust two-mast storage and retrieval unit handles the load carriers. It travels between the shelf towers with its push/pull device and wear-resistant, easy-maintenance chain lifting gear. A digital travel measuring system ensures exact longitudinal positioning. An additional load-independent digital measuring system permits precise positioning without having to move to a reference point.

Data are transmitted to the storage and retrieval unit via a photoelectric transceiver without any physical contact. Power is supplied via an overhead bus bar, ensuring quiet, low-wear operation. To prevent collisions during storage operations, the storage and retrieval unit automatically monitors the loading height at the storage locations above and below the selected location. The control unit, which monitors the functions of the storage and retrieval unit to ensure reliable operation, also checks the contours of each stack for sheets that protrude over the side. The storage and retrieval unit achieves speeds of up to 150 metres per minute when travelling, 23 when lifting and 20 when pulling or pushing. The weighing unit of



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the lifting beam determines the weights of the pallets and their loads when they are stored and retrieved, which makes it useful for efficient incoming goods inspection. 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. The software also graphically displays the storage towers and the SRU.



Dipl.-Ing. Dieter Bohnig, production engineer at WaCo

Current stocks in real time

A real-time soft PLC, integrated in an industrial PC, controls the components of the storage system. It communicates with the TRUMPF TC-Cell warehouse management computer via an interface supplied by STOPA. The software assigns storage locations dynamically, keeps track of the stocks and manages sheet metal data, thus providing a clear picture of the stocks at all times.

There are four available operating modes for the storage system. In online mode a higher-level host controls the system. If automatic mode is selected, the system processes individual orders by itself once the operator has entered the start and finish coordinates. The system will continue to run even if a fault occurs in the host. Other options are an interlock-free service mode in which employees enter commands directly at the storage and retrieval unit, and a manual mode with active safety interlocks.