



STOPA COMPACT for sheets up to 2,500 x 6,500 millimetres

Large-format sheet metal storage

The company KRONES AG manufactures large, high-quality sheet metal parts without joints and welds at its plant in Nittenau, Germany. Its processing machines are supplied by a STOPA COMPACT automatic storage system. One highlight of the facility is the large effective area of the cassettes that are used as load carriers. STOPA designed them to handle sheets in special sizes up to 2,500 x 6,500 millimetres, and in spite of their large size the facility occupies a relatively small area. It operates in three shifts with an availability of almost 100 percent. KRONES uses the sheets to make big modules that are shaped only by means of laser machining and bending. In this way it avoids welds and joints almost entirely. This has visual as well as technical advantages. The heat from welding could warp the products. Moreover, extra work steps would lead to longer throughput times.

KRONES makes little use of standard formats, which

means that it had to choose a storage system with a modular design like the STOPA COMPACT. With a customer-specific configuration the system can even store high objects like box pallets. Another advantage for the company is better delivery quality: long procurement times, which are usual for special formats, are not an issue.

Storage system supplies laser-cutting machines

The STOPA COMPACT storage system has three stations. Station 1 handles both incoming goods and outgoing goods for customers outside the plant. The scissor lift table at Station 1, with a maximum loading height of 510 millimetres, is equipped with plungers for storage and removal operations. The plungers are raised above the cassette level before a stacker or crane sets blank sheets onto a load carrier or picks them up. The cassettes lock automatically to the scissor lift table. A photoelectric sensor makes sure that the specified loading height is not exceeded. Stations 2 and 3 retrieve material from storage.



The STOPA COMPACT automatic storage system is configured here for special sheet formats up to 2,500 x 6,500 millimetres, allowing KRONES to meet its high quality standards.

Instead of scissor lift tables they each have a transport cart. In other respects they are like Station 1.

The storage system supplies a TRUMPF LASER-CELL 6005 cutting machine, where very large or long parts are processed. Standard-size sheets are cut on a TRUMPF flat-bed laser machine. These also come from the STOPA COMPACT storage system.

Reliable storage cycles with different loading heights

The STOPA COMPACT storage system at KRONES is 27,710 millimetres long, 10,200 millimetres wide and 10,888 millimetres high. It is made up of six shelf towers,

The robust two-mast storage and retrieval unit with its push/pull device achieves speeds of 60 metres per minute when travelling, 23 when lifting and 20 when pulling. For travel, it is positioned by a digital travel measuring system. For lowering and lifting, an additional absolute and load-independent digital measuring system permits precise positioning without having to move to a reference point. A photoelectric transceiver ensures contact-free and wear-free data transmission, and power is supplied quietly and with low wear by an overhead bus bar. For safety, the system checks the contours of each stack for sheets that protrude over the side. A weighing unit incorporated in the lifting beam records the weight of items placed in storage or returned to storage, calculates the quantities and updates the stock levels. If a cassette exceeds the specified



STOPA installed the storage system in a pit, lowering the floor of the system below that of the factory building. Thus it increased the storage volume by taking full advantage of the building's area and height.

arranged in two rows of equal length. The load carriers are 75 cassettes, which STOPA has assigned to fixed storage locations. Each can carry up to 7,000 kilograms of material and can be distributed among 14 storage locations. The 144 locations of the expandable system can hold cassettes with loading heights of 120 to 510 millimetres. A third loading height is planned. The small number of cassettes in relation to the number of storage locations comes from the fact that the system has two loading heights. In addition, the positions above load carriers that are filled higher than 120 millimetres must be kept free. KRONES currently has 35 sheet formats of differing exterior dimensions and thicknesses in its storage system.

weight limit, the system will not place it in storage.

Interface between the PLC and ERP system

A real-time soft PLC controls the components of the STOPA COMPACT storage system. It is integrated in an industry PC and performs the work of a Simatic S7. KRONES uses the PC to operate the system and display its status. The PLC is equipped by STOPA with an uninterruptible power supply (USP) for reliable operation. The control system communicates with a warehouse management computer that manages stocks and sheet metal data. By means of continuous stocktaking it provides a

clear picture of the stocks at all times. Heiko Bucher, head of the production team, mentions another important point: "An interface between the real-time soft PLC and the ERP system makes the data available for comparison."

Easy-to-understand function keys ensure simple operation of the system. A 12-inch TFT screen in the ergonomically designed control panel graphically displays the storage towers and the storage and retrieval unit. It also shows the status of the storage and retrieval unit in plain text format. In addition, the display shows free, occupied and blocked shelves as well as empty and filled cassettes and their respective loading heights. Cassettes that the system has placed in interim storage are displayed by the software with their number and a material list. Operation is very user-friendly. It is even possible to return box pallets to storage and manage them when they are labelled according to customer orders.

If a fault occurs that cannot be remedied by KRONES employees, STOPA can use the PC Anywhere remote maintenance software and the modem of the control unit to analyse and rectify the fault from its own location.



**Heiko Bucher, head of the production team
at the KRONES plant in Nittenau**

Good economic sense

The STOPA COMPACT automatic storage system makes good economic sense for a simple reason: the service life of the sheet metal warehouse significantly exceeds that of the machines linked to it. The system is also more economical because it opens the way to higher productivity. Material retrieval times for processing

machines are shorter, which means that the facility can work continuously at full capacity. An unstaffed third shift can also increase the capacity. Besides this, a STOPA COMPACT storage system makes it possible to put more machines to work without increasing the workforce. Work safety is also improved.

As of: 2011

Author: Jürgen Warmbold

Press contact:
STOPA Anlagenbau GmbH
Industriestraße 12
D-77855 Achern-Gamshurst
Tel. +49 7841 704-0
E-Mail: presse@stopa.com