SCHELLING

Schelling vs area storage system

Efficiency begins before the first cut.

schelling.com

SCHELLING AREA STORAGE SYSTEM: HIGH SAW EFFICIENCY, SHORT THROUGHPUT TIMES

A practical development which ensures a further leap in productivity for cutting panels to size: the Schelling area storage system makes an important contribution toward increasing production capacities up to 100 %, while saving valuable time and expensive storage space at the same time.

The key to this innovation lies in the fully engineered and automated organisation of the storage system. An area of 4 to 20 m in width and up to 120 m in length can be used in its entirety with stacks up to 2000 mm high. Longer systems and higher stacks are available on request. Feeding into/out of the stack, relocating and loading operations are carried out by a trolley which reacts quickly, precisely and saves space. The trolley moves along travel beams and a bridge above the stack of boards. Total height of the plant: only 3680 mm.

Storing can be carried out with adaptive strategies according to the order combinations, such as – individual jobs, large batch sizes or constantly changing production orders. The board stacks can be handled according to type, dynamically or as mixed stacks.

Since machine and storage system come from a single source – Schelling – perfect integration goes without saying. This includes simple operation and high reliability of software and technology. In short, an investment which not only pays off, but also secures new profits in a short time.

WELL THOUGHT OUT TO THE LAST DETAIL, COMPACT AND HIGHLY PRODUCTIVE

The technical concept of the area storage system is a travel beam carrying a bridge on which a trolley with a vacuum lifting unit moves. The bridge takes over the transport in the x-axis (over the length of the storage system), the trolley in the y-axis (width of the storage system), and the scissor-type lifting system attached to it in the z-axis (height of the storage system). Impressive load speeds of 150 m/min in the x-direction, 150 m/min in the y-direction and 60 m/min in the z-direction are achieved.

Trolley with scissor-type lifting system

The trolley has a scissor-type lifting mechanism which precisely maneuvers the vacuum lifting unit with the board onto the stack. The scissors are duplicated and thus especially stable. The double scissor versions combined with adjustable vacuum lifting unit mean a wide variety of board dimensions can be loaded. The direct drive system and high-performance motors are responsible for the smooth running of the trolley. The rotating scissor-type lifting mechanism allows boards to be stored underneath the travel beams, resulting in high utilization of the storage area.

The new designed scissor-type lifting mechanism allows for rotation of the board + 90° and – 90°. The non-restricted board orientation offers maximum flexibility and optimizes available space.

Patent pending.

Schelling area storage: high saw efficiency, short cycle times

Durable travel beam, dynamic bridge

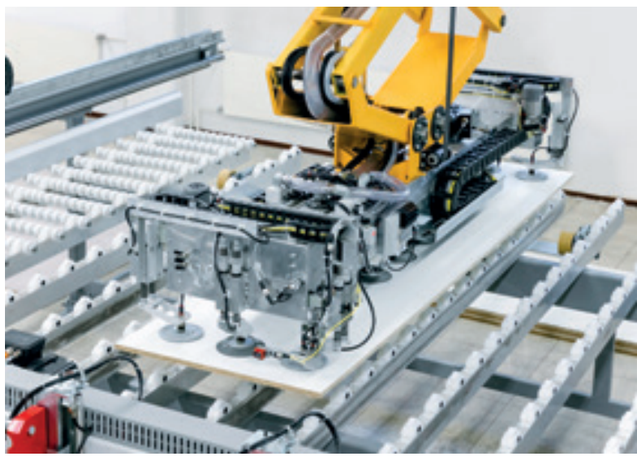
The highly durable travel beam allows storage lengths up to 120 m or more, if required. The smooth running of the bridge is due to the compact construction of the mechanics and electronics, as well as the low-noise high-performance motors. The weight-optimized two-beam construction is characterised by a low construction height of only 3680 mm and great rigidity. The direct drives ensure high driving dynamics, and thus rapid travel movements.

Vacuum lifting unit: Fixed or variable length

The vacuum lifting unit is suspended from the scissortype lifting mechanism of the trolley. Thanks to a central swivel head and optimized dimensions, it enables a minimum shaft dimension of 2000 x 600 mm for short or narrow parts. Optionally, the traverse can be selected for a defined length or with continuous length adjustment. The latter allows dimensions from 2000 to 4200 mm and, optionally, also from 2650 to 5650.

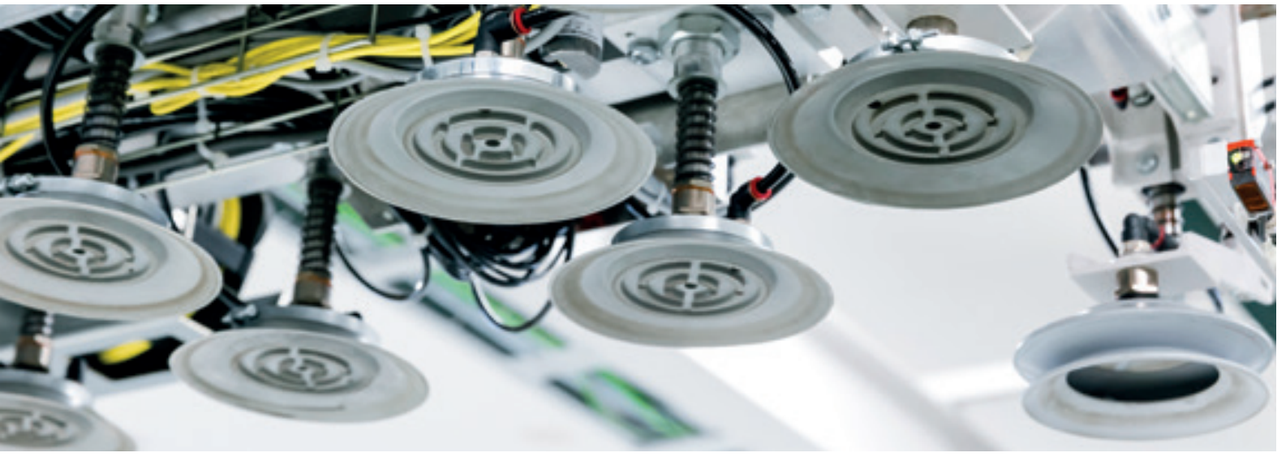
Vacuum lifting unit: Fixed or variable width

Even the width of the vacuum lifting unit can be selected as fixed or variable. The continuously variable width adjustment is offered from 1000 to 2100 mm and, optionally, also from 600 to 2100 mm or from 1250 to 2600 mm. The vacuum lifting unit can be adjusted to the material size by adjustment of the length or width. This means a wide range of board sizes can be stored with optimal use of space.



VACUUM LIFTING UNIT FOR ALL EVENTS

The vacuum lifting unit has eighteen suction units, four of which are corner suction units, and can powerfully grasp the boards. Up to six suction groups can be optionally selected for smaller board dimensions. Remainders up to a size of 1250 x 330 mm can be safely handled. The corner suction units are designed as bellows suction pads and lift the corners to separate the boards.



Powerful vacuum pump for secure holding of the workpiece

The vacuum pump for the vacuum lifting unit with a performance of 40 m³/h ensures a perfect grip of different board materials. More vacuum power is available for porous materials. Control with a frequency converter for vacuum reduction is also possible. For slightly porous boards, the vacuum power is reduced for separating the top board during lifting and increases after the board is lifted.

Board- and angle measurement

This option measures the board dimensions and the angular position with each relocation cycle and corrects the position of the board, if necessary. The turning unit can compensate angular deviations up to 5 degrees, so the boards are stacked precisely and the available storage space is optimally utilized. The board stacks can be built with only a small distance of 100 mm between them.

Perfect handling of thin materials

Optionally, the corner suction units for thin materials can be separately controlled and equipped with downholders. Clean separation of the thin boards is ensured.

Turning device: Ideal use of space

The optional turning device enables the boards to be rotated +/- 90 ° and therefore stacked either lengthwise or crosswise. The area storage system can be perfectly organised and filled. In addition, the saw is always loaded with the ideal board orientation.

High process safety

The trolley includes a weight measurement process which determines the weight of each board and compares it with the master data for the board, thereby preventing two boards from being picked up at once (from a board weight of 6 kg). This prevents incorrect deliveries and the stock level remains correct.

RAPID INTERPLAY OF CONTROL, SAW, STORAGE SYSTEM AND OPERATOR

The operating concept is simple and efficient: The saw and storage system can work independently of one another – even if one of the two plants is switched off. The system areas are separated by a safety fence.

Intelligent notification system

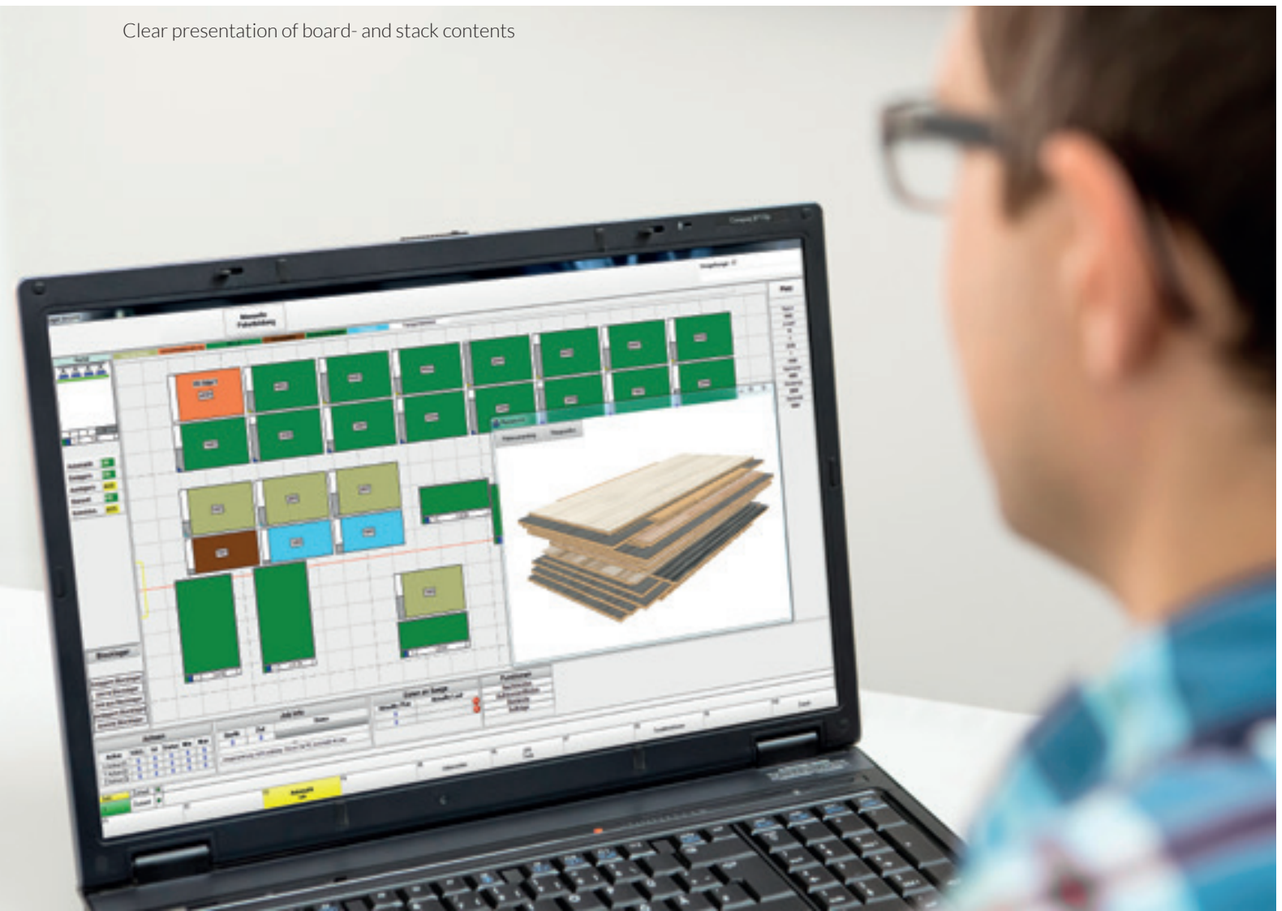
- Automatic generation of emails for any production stop that occurs (e.g. precommissioning during the night)
- Time-adjustable notification
- Priority control of the individual interruptions
- Up to five recipients can be defined

Storagemanager Advanced software

The Schelling area storage system Storagemanager software is clearly arranged, easy to use and carries out many steps itself. The graphical user interface with intuitive operator guidance is very convenient to use. An SQL-database forms the basis of the program that enables standardised and definable statements and evaluations. Relocation orders can be created easily with "Drag and Drop". Stack infeed, outfeed of the stack and relocation orders are controlled according to priority. The trolley always operates the saw and stack outfeed place first, only then carrying out the relocation and order picking. All data is automatically compared directly with the HPO cut-to-size optimization from Schelling, without any additional interface. This significantly harmonises the operating sequences and ensures high throughput both in the work preparation as well as in the production.

Storagemanager Professional software

This option is used if two saws should be loaded by the storage system. It offers all the functions of the "Storagemanager Advanced" plus a number of additional specific features. It manages the outfeed to a second saw, operates up to four stack infeed places and two order picking places and allows the connection of up to two hand-held or radio scanners. The storage system, saws and orders can be monitored and controlled remotely using terminals in the board storage system, at the first and second saws and in the office.



Clear presentation of board- and stack contents

Advanced functionalities for efficient operation

- 3D-Visualisation
- Clear graphical user interface
- Simple and intuitive operation
- Data management takes place in SQL-database
- Standard and self-defined SQL-statements for evaluations
  - Overview of stocks
  - Individual statistical evaluations
- User administration
  - Individual password assignment
  - 0 to 9 levels of release authorisations
- ABC analysis for optimized storage strategies
- Quick-connect function
- Material master data definition – cyclical, automatic import of the master data as a CSV file
- Fully automatic data exchange of board inventory with the HPO optimization program
- HPO multi-user systems
  - Real-time query of a material
  - Reservation of residual materials in the storage system
  - No double allocation of residual materials
- Multiple function of the stack infeed place
  - As a stack infeed place
  - As a material transfer place
  - As an order picking place
  - As a direct mounting place
- Monitoring of the minimum stock based on the board type
- Stock removal over time
  - Boards can be fed out if a set time is exceeded for a particular material.

All movement data is always in BDE view – production data reporting

- Display of all storage movements
  - Relocations / Outfeedings / Infeedings
  - Prepicking / Picking
  - Export function to Excel or as a printout
- Graphical representation of the data
- Selection according to
  - Day / week / month / quarter or year
  - Material

Intelligent prepicking logic

- Depositing logic / prepicking logic
  - All order prepicking processes is carried out with foresight
  - Required positions are not obstructed
  - Required boards are not parked on positions that are not required
  - Clearing mode = if the order is cancelled. The parked boards can be cleared up again.

STORAGE STRATEGIES FOR RAPID HANDLING AND HIGH USE OF SPACE

The control of the Schelling area storage system permits tailored storage strategies. Besides the stack infeed and outfeed places, tailored protection board places, order prepicking and picking places can also be simply and quickly designated.
If the requirements change, they can be quickly and simply reassigned in the control. An individual strategy can be assigned to every storage place.

Universal safety concept

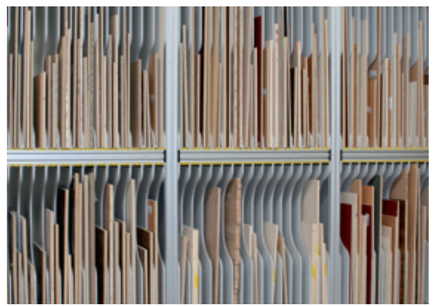
The Schelling area storage system has a direction detection system and adjusts the movement speeds to safety requirements. Also, safe positioning and dynamic board measurement allow optimum use of the available space. Short and long boards can be deposited near the edge area. This means maximum use of space and short cycle times with highest personnel and plant safety.

Always tidy – management and storage of large and small remainders

Remainders of material can be managed in two ways. Large remainders can be returned to the storage system via the saw, a remainder return or via the stack infeed place. The HPO cut-to-size optimization can immediately plan the remainders again with priority. Smaller remainders are perfectly managed by the Schelling XBoB remainder program (optional). Smaller remainders are labelled and sorted at a clearly defined manual storage space automatically. The system calls up the remainder planned via the optimization as soon as it can be processed.

Control panel

The area storage system has an ergonomic, very clearly arranged control panel with a generous 22 inch screen. All information is clearly displayed and a simple control is provided. The control panel of the saw is equipped with additional keys for the operation of the area storage system.



Stacks according to type: static and dynamic

For boards that are required constantly, it is recommended to store them "according to type" and to locate them in close proximity to the saw. This allows direct access to the material, without lengthy restacking and results in high cycle times and rapid loading of the saw.

The "according to type / dynamic" strategy makes sense for boards temporarily in frequent use. Here a storage space is only used by one finished part until these boards have been used up. Quick access is assured. Greatly fluctuating amounts of frequently used material require less storage space.

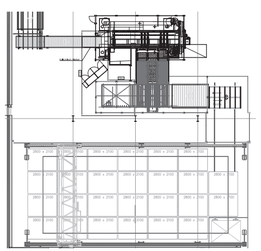
Mixed stacks

Mixed stack storage makes sense for all other cases. The places are constantly used as storage places for predefined materials to the maximum possible height as a mixed stack. A number of zones can be defined as mixed stack zones. This means a large number of different boards can be stacked on fewer places. The storage places can be used in an extremely flexible way.

Manual block storage administration

Outside of the area storage system, the block storage (optional) is a freely definable area which is managed in the control of the storage system. Any number of places can be occupied. This is especially suited for frequently used materials which are fed directly to the saw and also for rarely used materials.

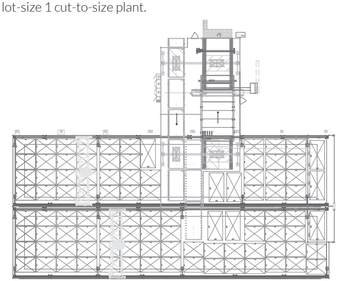
Schelling area and consignment storage system with connection to a CNC machine.



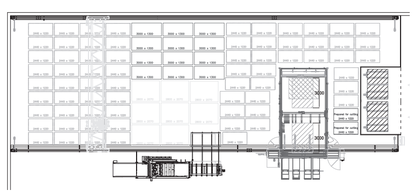
Customized planning

Each Schelling area storage system is planned on a customer-specific basis, i.e. storage lengths up to 120 m (greater lengths on request) and storage widths up to 20 m are adjusted to the customers individual situation. Saw-storage combinations, linking to various machine concepts or the connection of multiple stocks allow a maximum utilization of the available space together with a high production output.

Two linked area storage systems with a Schelling lot-size 1 cut-to-size plant.



Saw-storage combination with connection to a nesting machine.



TECHNICAL DATA

Component size	
Length	2000 – 4200 mm
	2650 – 5650 mm
Width	1000 – 2100 (max. 2600) mm
Component size remainders	
Length	600 – 2100 mm
	1250 – 2600 mm
Width	515 – 2100 mm
Dimensions	
Basic beam with carriage length	up to 120 m
	(larger on request)
Travel speed	
Span of bridge	4 – 20 m
Travel speed in x	150 m / min
Travel speed in y	150 m / min
Travel speed in z	60 m / min
Stack height	
Stack height	2000 mm (higher on request)
Distance stack in board storage	100 mm
Component weight	max. 350 kg

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