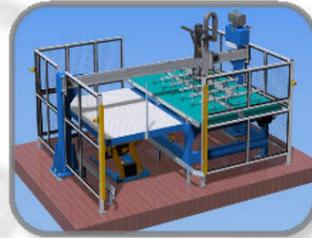


Equipment / options / additional equipment:

The following is a selection of different options/additional equipment for plate stacking machines:

Lifting tables in stacking area

In case of extrusion systems that run very quickly, lifting tables for positioning the palettes are partially used in the stacking area. These offer the advantage that the movement of the vertical axis of the transverse carriage is shortened, which saves cycle time. The lifting table corrects the positioning height after placing a production plate, which therefore always cycles downwards as the plate stack on the palette grows.



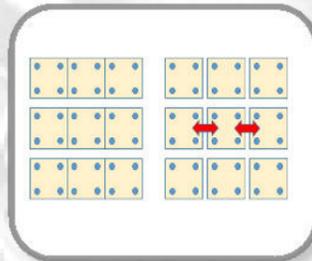
Transport carriage

Instead of direct positioning of a palette in the stacking area, an individually designed transport carriage may also be used. In this case, the plate is placed on the transport carriage outside of the stacking area and then pushed into the stacking area with the transport carriage. The advantages in this case include the option to prepare a transport carriage with a palette and cardboard, film, etc. to shorten the time for actually changing the palette.



Special transverse suction beams

Besides distribution into different working areas (suction zones), transverse suction beams for accepting the production plates may also be equipped with additional functions. One option, for example, is spreading plates placed on each other to achieve clearance between the individual plates. Another option is to rotate the accepted plate by 90 degrees or another angle.

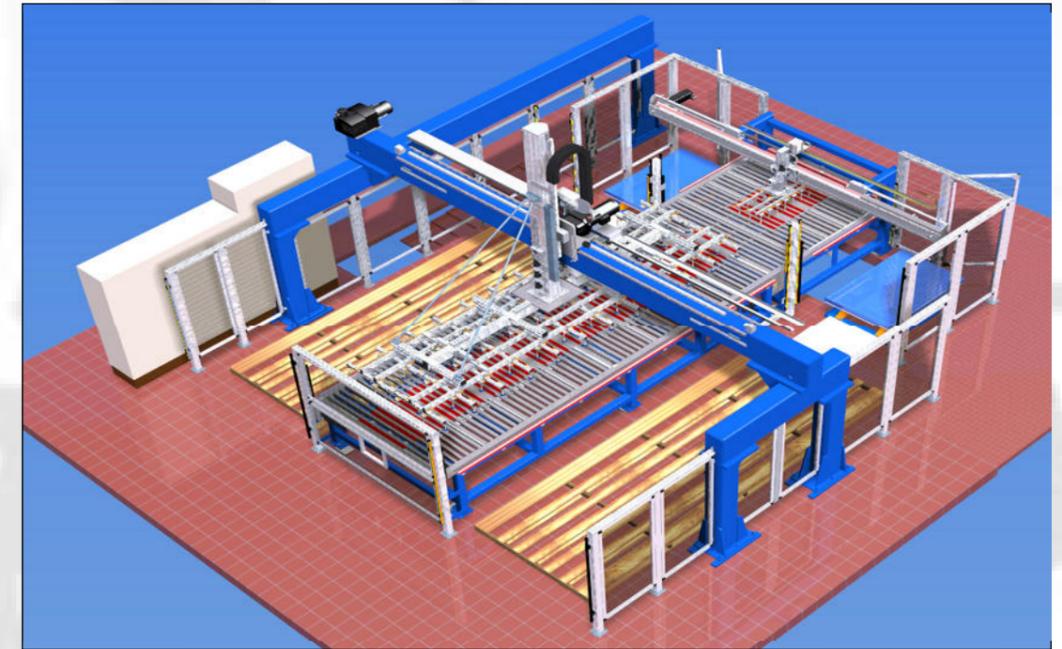
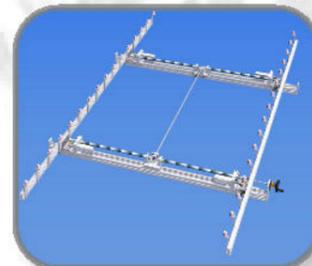


Centring and spreading devices

In order to achieve homogeneous plate stacks on the palette, the individual plate may be centred in the centre of the transport table before acceptance by the transverse suction beam.

The installation of a spreading device on the transport table enables plates that are placed on each other to be separated at the edge for acceptance by the transverse suction beam.

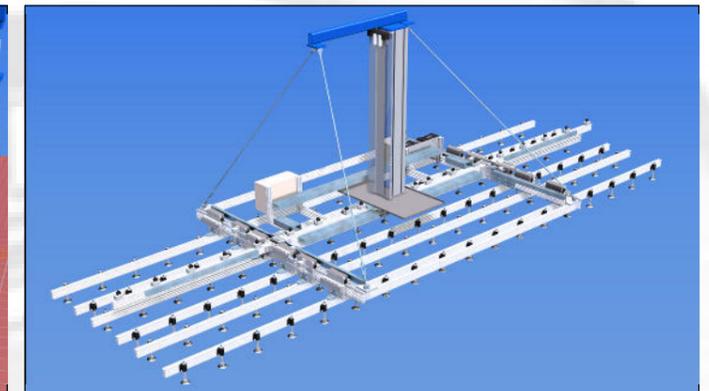
Installed end stops for the production plates ensure the homogeneity of the plate stack in terms of length.



System featuring two plate stacking machine in sequence



Stacking area



Transverse suction beam with spreading function

Basic information about STEIN plate stacking machines

STEIN plate stacking machines are designed so that the previously shortened production plates cut by the cross-cutting device of the extrusion system are set down automatically on transport palettes or carriages.

In the case of plate stacking machines, the dimensions of the respective production plates automatically specify the space required for the machine. Essentially, a transport table is always required for removal of the produced plates and one (or more) deposit area(s) are needed for the machine to function. The space requirements at the installation location are usually available and may only be adjusted by the customer to a small degree. In some cases, different version of plate stacking machines for extrusion lines may even be needed in a single production workshop. For this reason, it is often necessary to adjust the concept of the plate stacking machines to suit the conditions at the installation location.

We have developed multiple basic concepts for the layout of plate stacking machines that result in optimal space utilisation and functions in combination with each other.

Besides the dimensions of the product palettes, factors such as production speed, weight of the production plates, and packing of the products play a role in designing a suitable machine and the selection of additional equipment.

Basic mechanical layout

- Belt or roller tables are used to transport cut production plates into the plate stacking machine. Depending on the application, these are made of aluminium profiles or welded hollow steel profiles. The belts or rollers are laid out according to the product requirements.
- Traverse carriage depending on the application in various designs. Partially aluminium, partially steel construction. All versions equipped with corresponding high-performance guide systems and drive elements.
- The traverse suction beam for accepting production plates using vacuum suction is mainly comprised of aluminium. The number, size, and material of the vacuum suction plates are defined together with the customer according to the production requirements. In case of different packaging for the production plates, multiple work zones may be added. Flat suction systems may also be used in some cases.
- In the stacking area, palettes may be set down directly or pushed into transport carriages. A push-in/push-out system via rails or similar is also possible. It's basically important to make sure that there are enough stacking areas to enable a palette change. In case of one stacking area only, the palette must be provided within the interval by two production length cuts or palettes that are received during the change must be removed manually. In case of multiple stacking areas, these may be alternated for stacking.

Electrical technology

- The technical electrical components of the plate stacking machines may be integrated into the transport table of the system. For access reasons, a free-standing variation is usually preferred for the main switching cabinet of the machine.
- Regular drive motors are used to drive the belts or roller tables, or, in case of a large gap in the conveyor speed, servo drive motors may also be used. In this case, servo motors also enable applications like the exact positioning of plates for acceptance or generation of clearance between the individual plates.
- Servo motors or asynchronous servo motors are used as drives for the axes of the traverse carriage units. For this application, exact positioning, high movement speeds, and approaching multiple positions are required.
- The control panel of the machine makes it easy to read and adjust production-specific data. As required, an order management system for recurring production orders may also be integrated. Machine settings for a certain production run are added as a "package" and may be accessed again as required.
- Several applications for plate stacking machines require synchronisation and data exchange with the upstream traverse cutting unit. In case of a STEIN traverse cutting unit, this communication is of course already present.

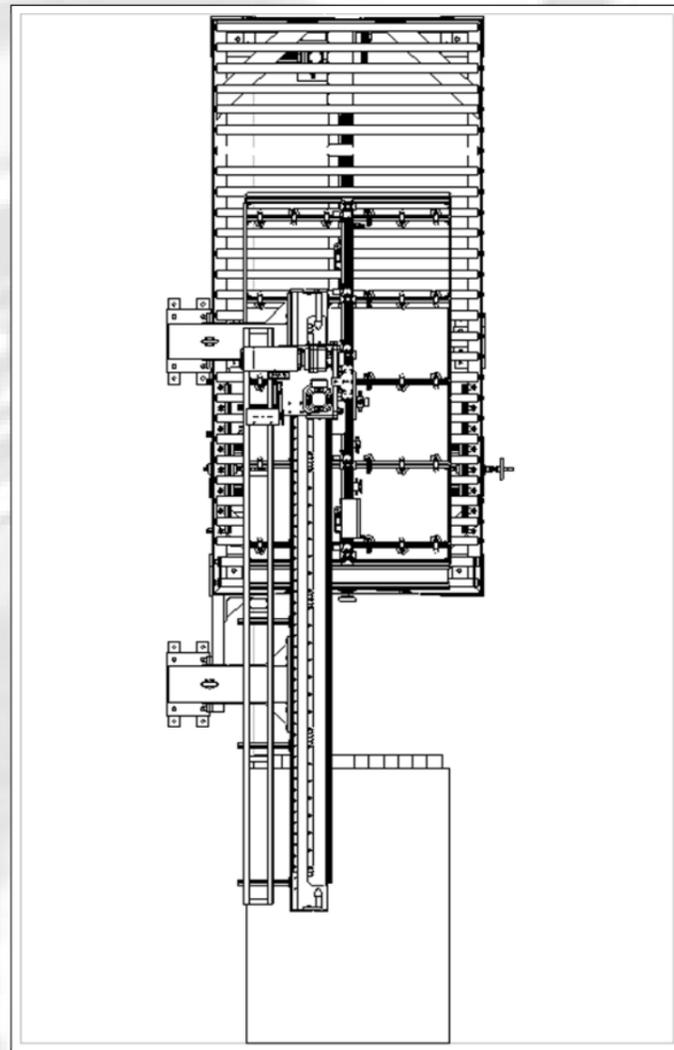
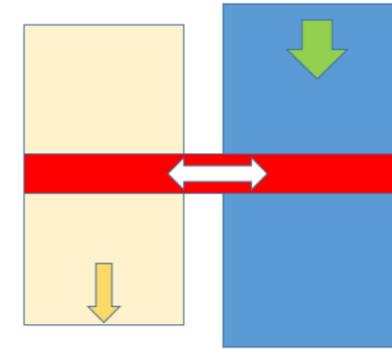


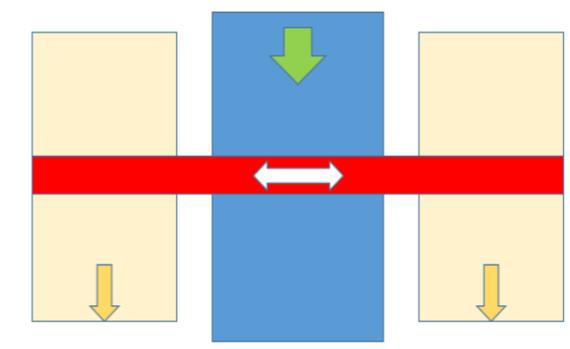
Plate stacking machine with stacking area in extrusion direction

Sample concepts for plate stacking machines according to stacking area arrangement

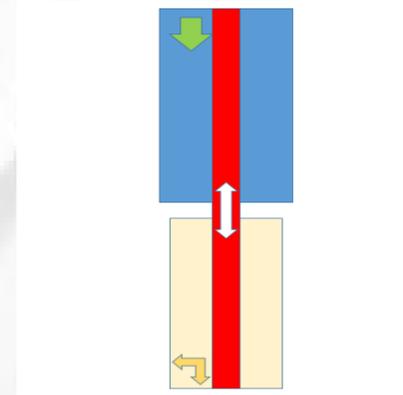
The following is a selection of concepts for the arrangement options for stacking areas in relation to the transport table of a machine. Graphic: Transport table: Blue; stacking area: Yellow; movement axis: Red



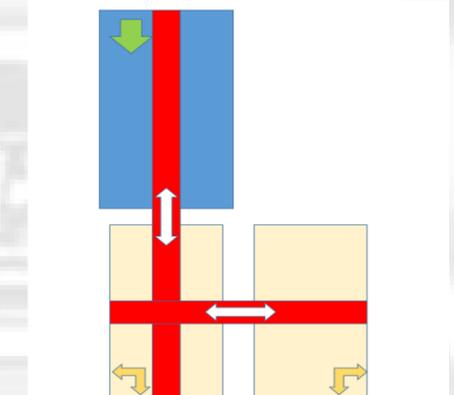
A stacking area to the side of the extrusion system.



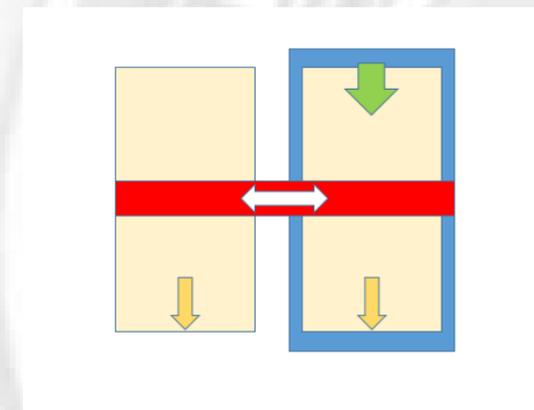
One stacking area to the right, one area to the left of the extrusion line.



A stacking area along the extrusion system.



Two stacking areas along the extrusion system. Including secondary horizontal axis.



One stacking area to the side of the extrusion line, one area under the transport table of the machine.