



Siempelkamp

Maschinen- und Anlagenbau

Laminating plants





Short-cycle lamination – a process for modern products with diverse applications

The lamination of particleboard, MDF, and HDF panels with thermoset plastic film (resin-coated papers) is a fast, precise, and economical process which is used today for just about every conceivable decorative surface. In fact, it would be hard to find a room anywhere in a building which does not have directly laminated panels of some form, either in laminate flooring or furniture.

As a press specialist, Siempelkamp has delivered the machinery to produce these products since their first introduction and has always worked closely with resin and paper producers to advance the associated technology. Today's modern short-cycle press offers exceptional performance to meet the increasing demand for laminated wood-based panels.

With the precise technology used in these machines, decorative films are pressed onto a base panel in such a way that the finished product is difficult to distinguish from genuine wood products. These laminates are more durable and easier to clean than real wood and offer a more attractive price (e. g., laminate flooring). At the same time, laminates help to protect our natural wood resources.

A lot of good arguments for a good product – one which is an ongoing global success story.



The press range for short-cycle laminating



Press with 2,200 x 5,700 mm hot platens

Single Board Press

This press is the workhorse of the Siempelkamp product range. Hundreds have been delivered to customers who value its unbeatable reliability. This press features generously sized hot platens of solid steel which provide excellent pressure distribution. The uniform temperature distribution of these platens is assured by use of a double channel heating system.

The Single Board Press is also fast, with charging times of 8 seconds and cycle times of up to 220 presses per hour.

Standard board sizes range from 1,830 x 3,660 to 2,100 x 5,600 mm.



Press with two 2,200 x 5,700 mm hot platens

Double Board Press

This press is based on the same technical concept as the Single Board Press, but designed to

laminates two boards simultaneously with panel lengths of up to 2 x 5,600 mm.



Multi Power Press

Compared to today's conventional presses which have two rows of pistons, a 2,600 x 5,800 mm format Multi Power Press has four pistons across its width and ten along its length (i. e. a total of 40 press pistons).

The main advantage of this new design is a much more uniform temperature and pressure distribution. This feature is a particular advantage for the lamination of HDF flooring and furniture panels which have greater width and length variations. The Multi Power Press comes with several pressure circuits which permit the optimum adjustment of lengthwise and crosswise pressure for different board sizes.

This press is capable of up to 220 presses per hour.

Standard board sizes range from 1,220 x 2,440 to 2,440 x 5,700 mm.

Press with 2,600 x 5,800 mm hot platen

Handling systems for speed and exact positioning

Precision paper laying system

Siempelkamp's precision paper laying system was developed specifically for the manufacture of laminate flooring. This patented system features a high-precision paper laying and aligning device which achieves placement tolerances of ± 1 mm in both length and width dimensions. The paper is aligned using either the edges of the paper or print marks on the decorative paper.



Vacuum tables for aligning individual sheets of paper



Decorative paper laying station

Other advantages:

- No foundation pit
- High flexibility due to no-delay pallet change
- Individual sheets of paper can be turned
- High output 8 sec. cycle



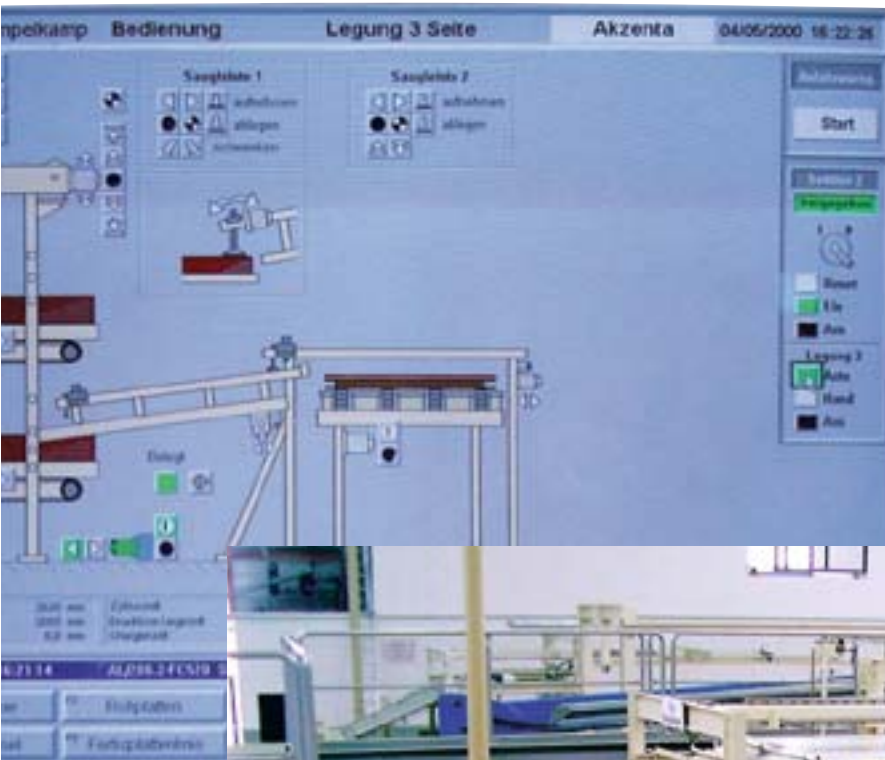
Paper laying system with 3 laying units for laminate flooring



To see all is to know all

All press lines utilize an integrated visualization system based on Intouch Wonderware or Rock-

well RS View. The PLC controls are from either Siemens or Allen Bradley. This design enables production and process data to be acquired which, in conjunction with an interface to a higher level operating system, form the basis for managerial analyses. Additionally, the visualization system also permits fast and reliable fault diagnosis.



Inline paper laying system with pallet changing devices

Inline paper laying system

This production proven handling system separates the paper from two stacks automatically and includes a device for the quick changeover of pallets. The decorative papers are run onto the carrier board symmet-

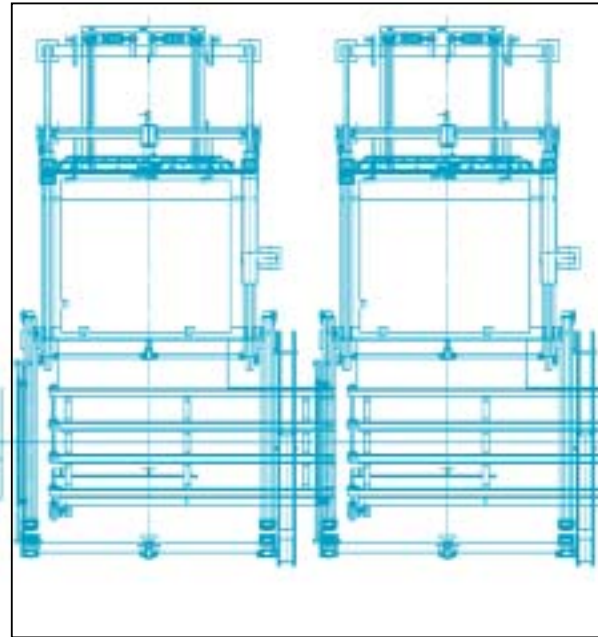
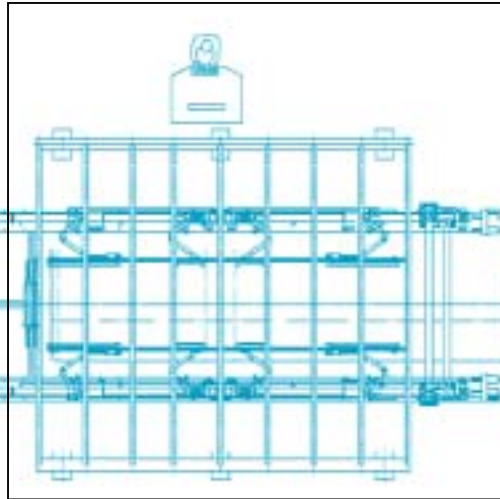
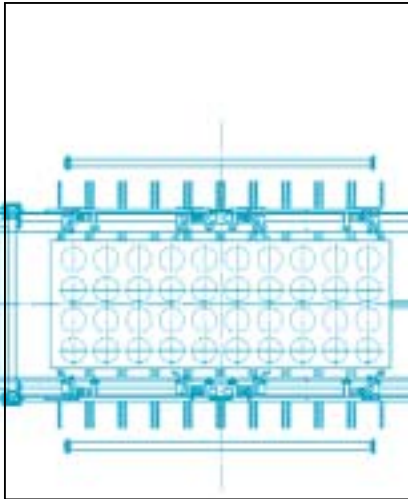
rically from above and below. Now covered on both sides, the board is then conveyed to the transfer station in front of the press. Designed for high outputs, this system is particularly suitable for the manufacture of furniture

panels and in combination with a high precision paper laying system for laminate flooring.



Short-cycle lamination line with register embossing for the production of laminate tiles and synchronopore products

← Production flow



3 Press with loader/unloader

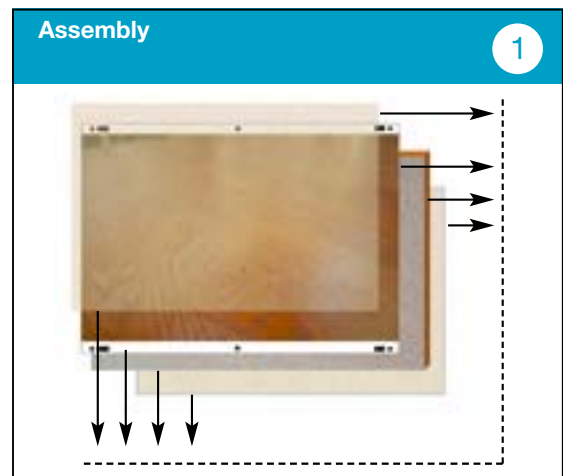
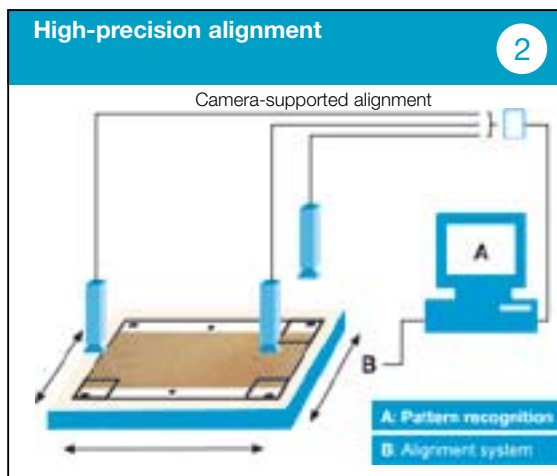
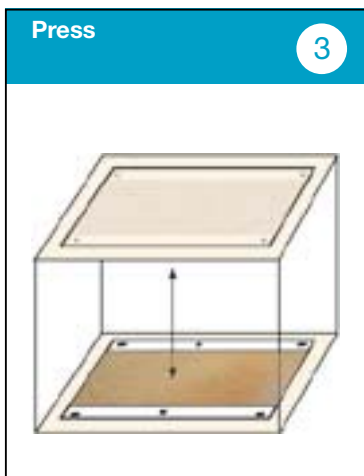
- precise press table guidance
- defined press plate alignment
- accurate loader guidance
- toothbelt-driven loader/unloader with high performance and repeat accuracy

2 Camera systems and adjustment unit

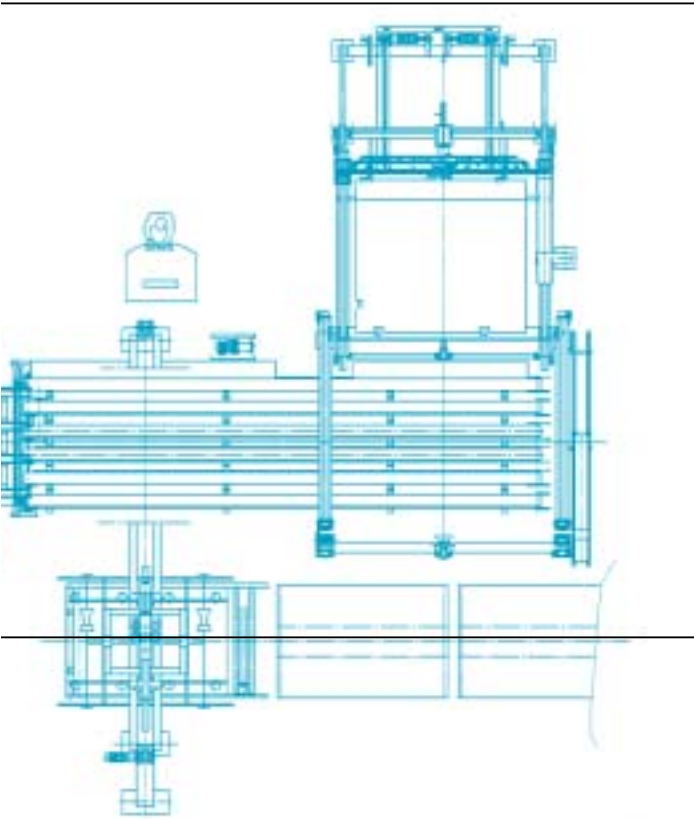
- high-precision alignment

1 Paper and board assembling

- precise assembling of papers/foils and board



Short-cycle line with register embossing



High degree of consistent lay-up accuracy

The foils are laid up very accurately. In addition, the charges are placed in the press very precisely, cycle after cycle. Both are vital for obtaining high-quality products.

The charge is aligned on the decorative paper by means of register marks. This process is repeated with a tolerance of ± 1 mm.

Compensating for paper tolerances

Three cameras and alignment units per board make it possible to compensate for any paper tolerances and obtain the optimal alignment.

Transfer station with camera monitoring upstream of the press



More profitability through intelligent MES and industrial IT

Lam-IQ – the intelligent process control-system

Lam-IQ is a computer process control-system by Siempelkamp, tailored to the special requirements of wood products laminators. Lam-IQ is based on a continuous Software-Module structure and can easily be tailored to the individual requirements of the operating company.

The operating data enable a total control over inputs and targets. They deliver critical parameters for making improvements.

The availability of fast and needs-based data leads to more transparency and makes it possible to compare press line efficiency in the same or different locations.

The comparison of two press lines results in different consumption data for the same product. In case of deviations, measures for an increase in efficiency may be derived.

The downtime analysis shows the production and downtime times at a glance and aims at identifying avoidable break-



Recording of quality data

IamIQ Software Modules

Basics

Data acquisition

Acquisition of process data and their central storage in a database.

Downtime acquisition/statistics

Module for the systematic identification of downtimes and their causes.

Change of lay-up

Manual input and change of material and production.

Commission, shift, daily and monthly evaluation

Summary of the most important production and consumption data.

Quality report

Summary of quality data and related production data.

Options

Options ERP interface

- Job management
- DB-Replicator
- Certified SAP coupling

Option press caul/press pad management

- Menu driven configuration
- Control of operating times



Entry for production order change

The screenshot displays a complex data entry and reporting interface. At the top, there are fields for 'Parting quantity', 'Material', 'Material', 'Sub', 'Lot', 'Start', 'End', and 'Date'. Below this is a table with columns for 'Kontrolle', 'Schicht', 'ID', 'Teamleiter', 'Detail', 'Kontrolle', 'Übers', 'Sichtkontrolle', and 'Jockey'. The main part of the interface is a large table with multiple columns, including 'Lieferant', 'Lieferant/Charge', 'Parting quantity', 'Anzahl', and 'Anzahl'. Below the table, there are several sections for 'Eigenschaften der beschriebenen Platte' (Properties of the described plate), including 'Zeit der Entnahme', 'Dichtmessung', 'Längsbreite', and 'Gesamtbreite'. Each section has input fields and a 'Messung' (Measurement) button. On the right side, there are 'Hilfs' (Auxiliary) fields for 'Qualität (Punkte)', 'Gesamtwert', 'Übergang', 'Sicherheits (Index 1-6)', and 'Vorauskontrolle'.

Quality report

downs and reducing the possible causes. By means of downtime statistics, the analysis of this data is carried out in tables and graphical presentations. Consequently, bottlenecks can be recognized clearly and can be eliminated. This leads to better equipment availability.

Further analyses, for example the shift report, are generated automatically. In comparison to the manual reports, the automatic reports take considerably less time to be generated, cause fewer mistakes, and prevent the manipulation of results.

The examination of the data of the quality protocol indicates

possible causes for minor quality problems or even scrap.

Besides the modules implemented in the basic package, further modules as options for the order management (if required with ERP-connection to SAP, Baan,

etc.) as well as press plate and pad administration are available.

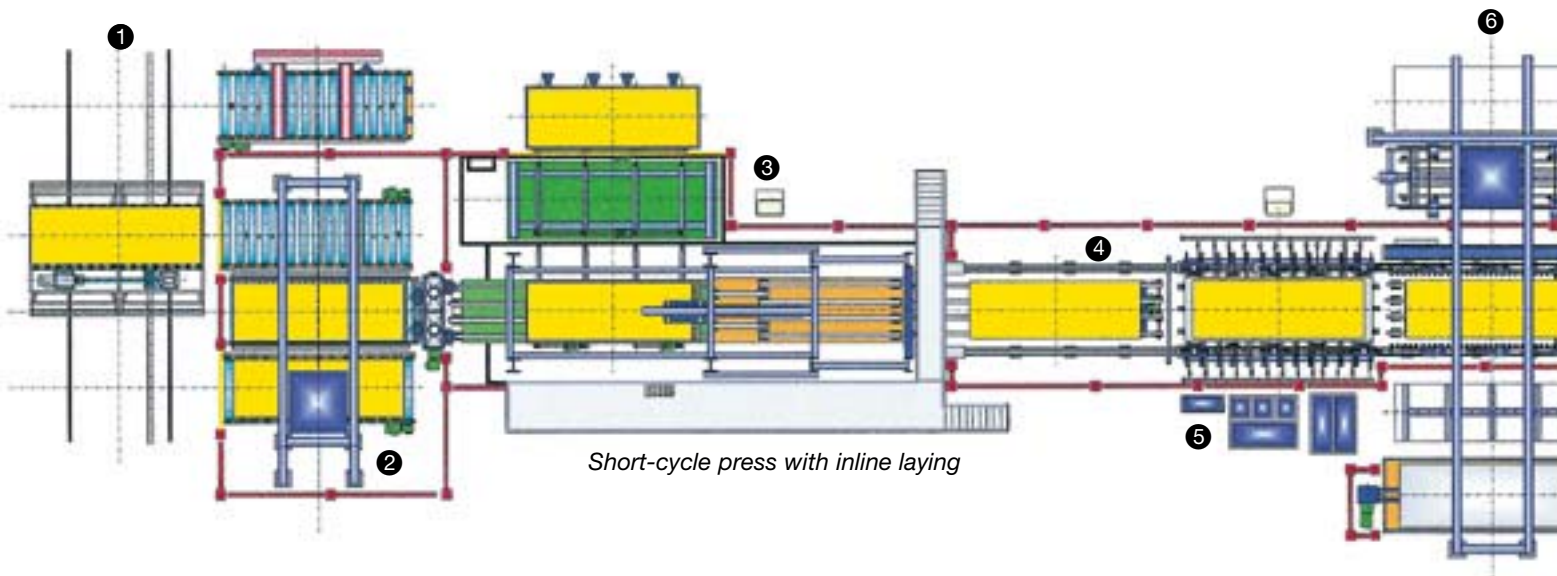
The system will be supplied fully installed as a complete package. The personnel will be trained directly after start-up or one by one by arrangement.



Siempelkamp short-cycle press lines for perfect furniture and flooring panels

Siempelkamp engineers, supplies and commissions complete laminating plants –

using in-house production expertise and process technology.



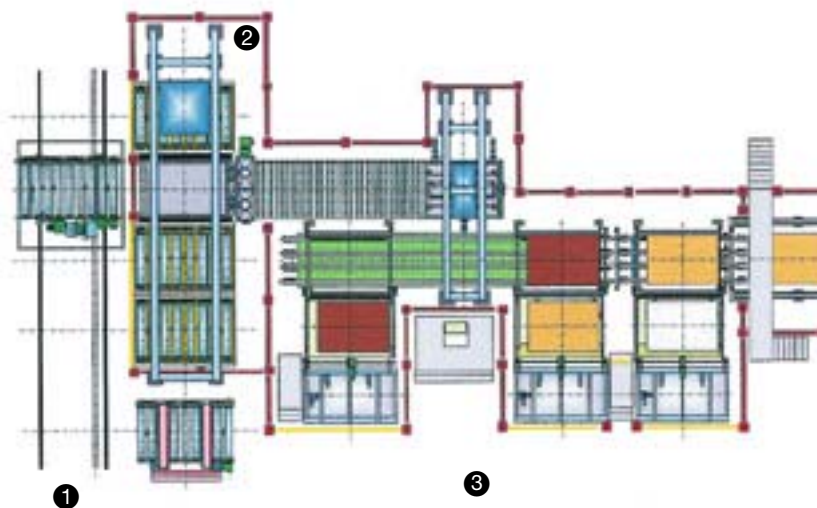
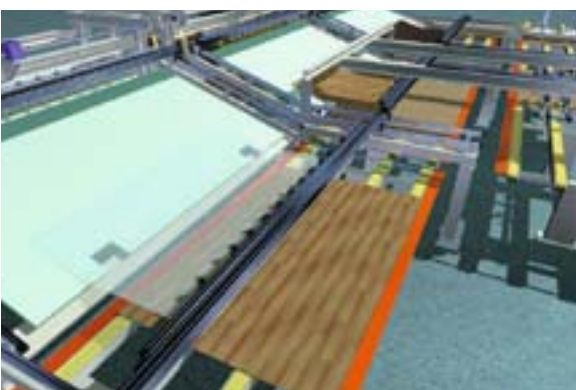
Short-cycle press with inline laying

A typical plant for furniture panels

- ❶ Raw board infeed with distributor carriage
- ❷ Separating station with double transfer device for no-delay stack change

- ❸ Paper laying station with inline paper laying system and pallet changing equipment
- ❹ Clamp-type loading device combined with vacuum unloader

- ❺ Down-stroke press with oil-hydraulics and temperature control circuit
- ❻ Automatic press caul change equipment

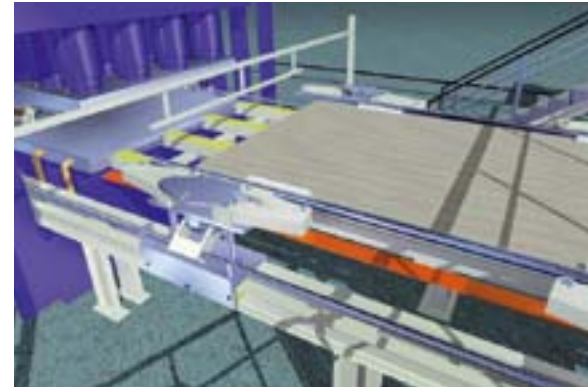
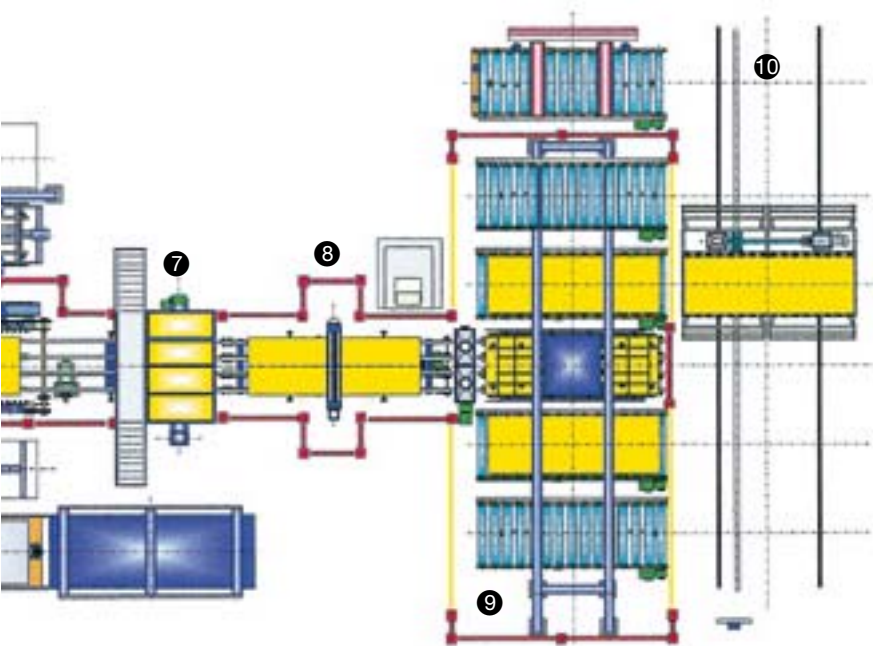


A typical plant for laminate flooring

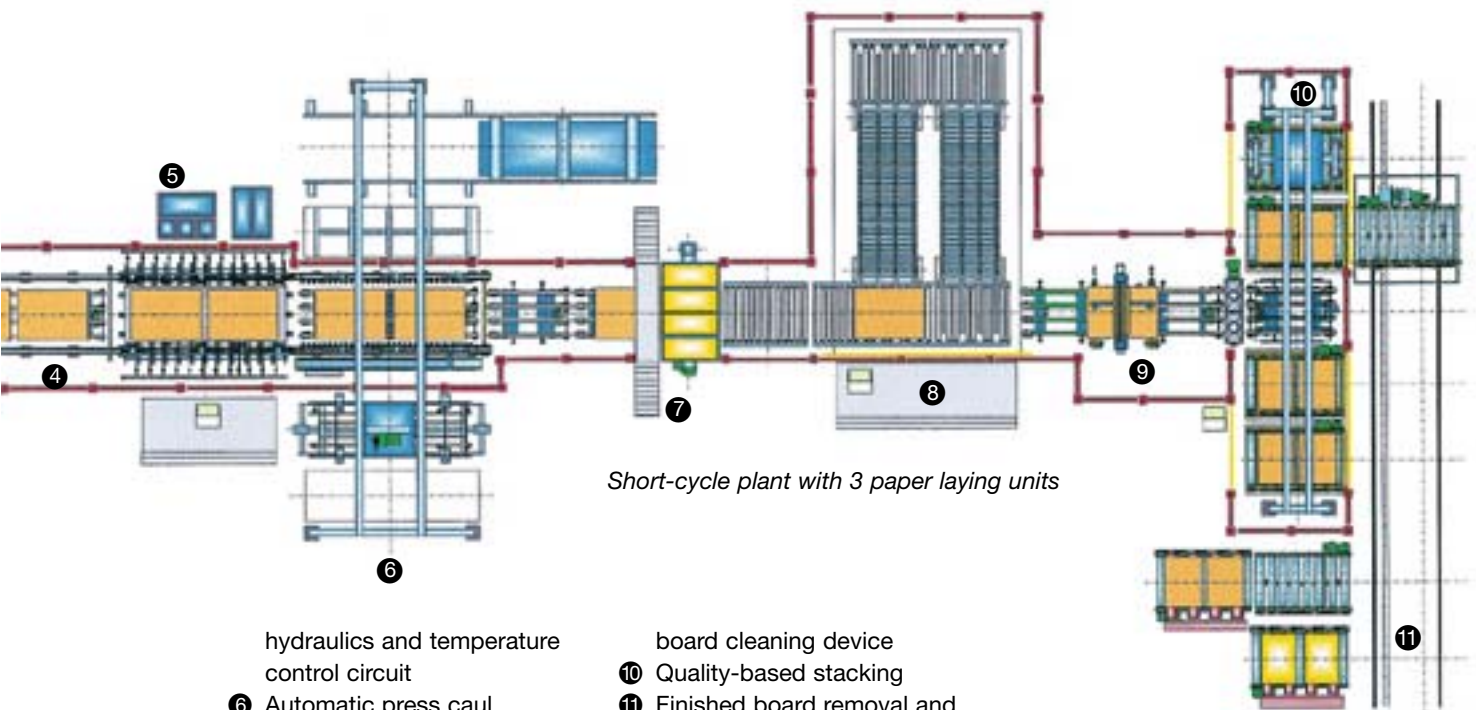
- ❶ Raw board infeed with distributor carriage
- ❷ Separating station with raw-board suction carriage for no-delay stack change

- ❸ Precision paper laying units for balance paper, laying on raw boards, decorative papers and overlays with permanently installed 2-deck magazines for no-delay pallet change
- ❹ Clamp-type loading device combined with vacuum unloader
- ❺ Down-stroke press with oil-





- 7 Edge trimming equipment
- 8 Cross-cut saw with finished
- 9 Quality-based stacking
- board cleaning device

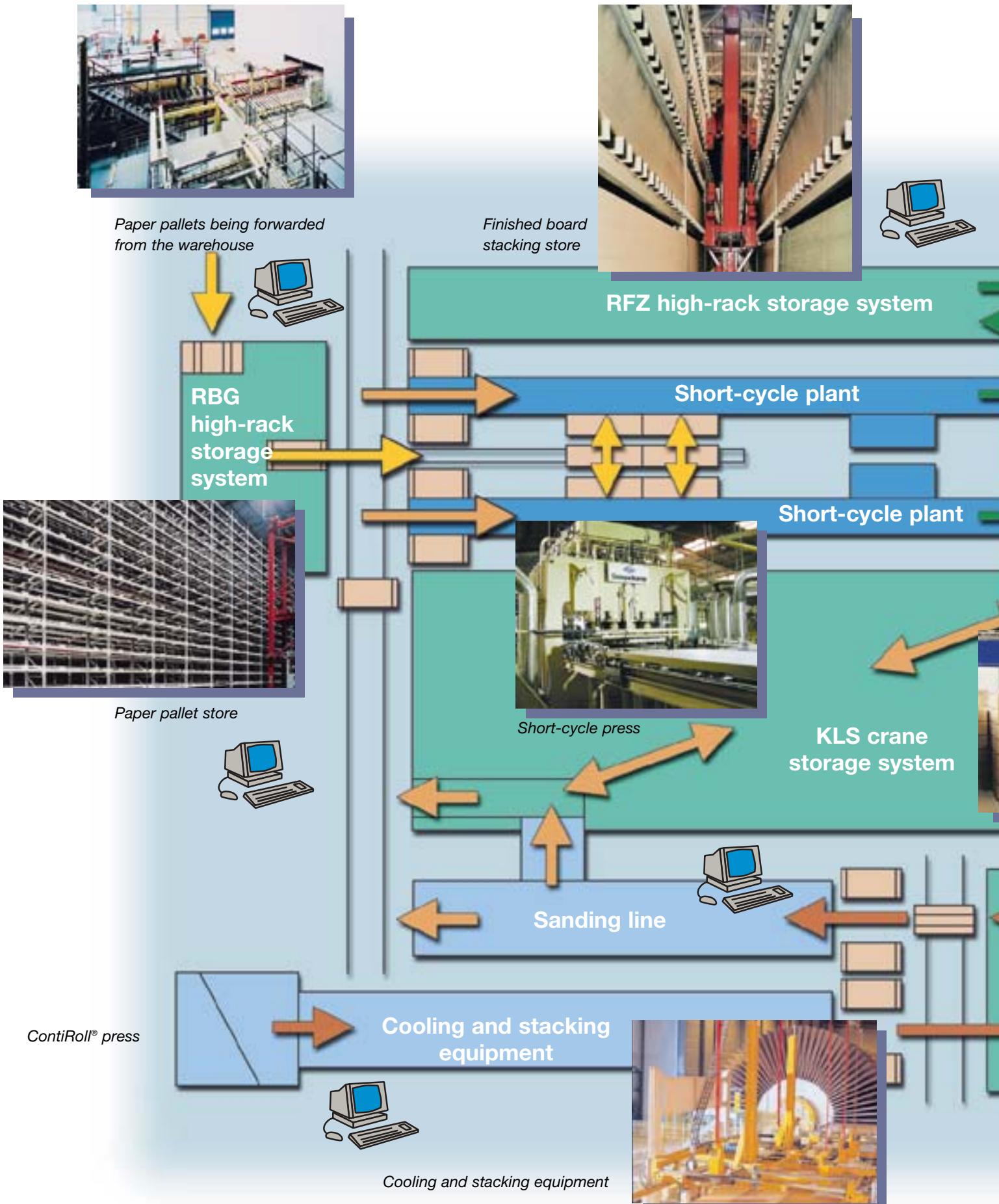


Short-cycle plant with 3 paper laying units

- 4 hydraulics and temperature control circuit
- 5 Automatic press caul change equipment
- 6 Edge trimming equipment
- 7 Cooling section with quality control
- 8 Cross-cut saw with finished
- 9 board cleaning device
- 10 Quality-based stacking
- 11 Finished board removal and pallet stacking infeed unit

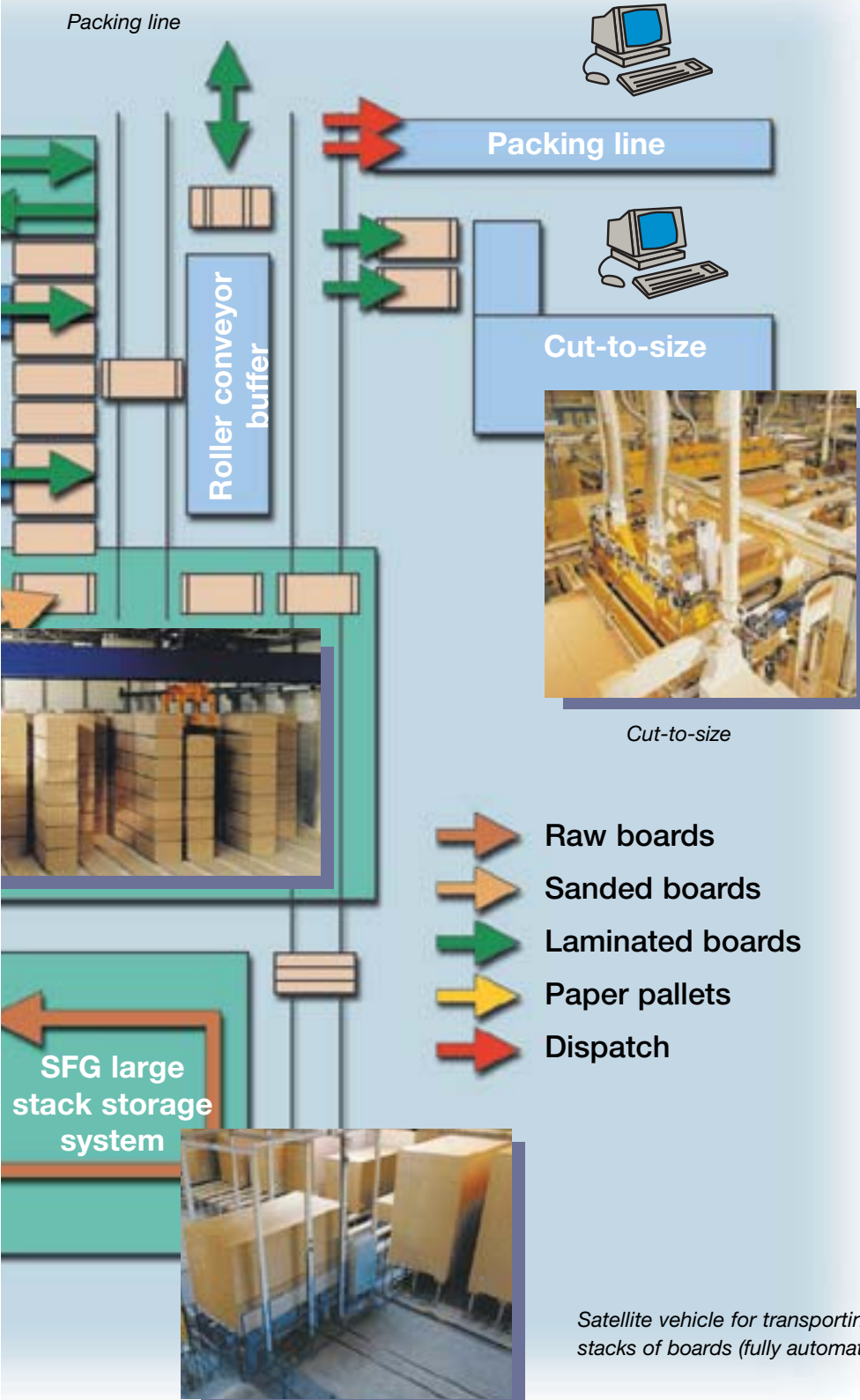


The complete laminating plant with integrated logistics





Packing line



Cut-to-size

Siempelkamp is able to supply complete innovative systems. In combination with Siempelkamp Handling Systeme (SHS), Siempelkamp is able to build complete laminating production centers.

The customer benefits from the system in many ways: optimal use of space, reliable and protective transport of materials, integrated system interfaces, and high levels of efficiency. The complete system can be networked, from the basic process level to the enterprise resource management level (ERP).

The result is the optimal integration of order, warehouse, and materials management.



Siempelkamp

G. Siempelkamp GmbH & Co. KG

Machinery and Plants



Siempelkamp

Maschinen- und Anlagenbau

Siempelkamp Maschinen- und Anlagenbau GmbH & Co. KG



Dr. E. Schnitzler

Industrieplanung

Zweigniederlassung Maschinen- und Anlagenbau GmbH & Co. KG



Siempelkamp

Handling Systeme

Siempelkamp Handling Systeme GmbH & Co. KG



ATR

ATR Industrie-Elektronik GmbH & Co. KG



Siempelkamp

Pressen Systeme

Siempelkamp Pressen Systeme GmbH & Co. KG



Siempelkamp

Siempelkamp (Wuxi) Machinery Manufacturing Ltd., China



Siempelkamp

Siempelkamp L.P., Marietta, USA



Siempelkamp

Siempelkamp Canada, Cambridge/Ont.



Sicoplan

Engineering

Sicoplan N.V.



BÜTTNER

Trocknungs- und Umwelttechnik

Büttner Gesellschaft für Trocknungs- und Umwelttechnik mbH



CMC TEXPAN *

CMC S.r.l.



PAL S.r.l.



IMAL S.r.l.

Representatives

Italy

Siempelkamp S.r.l.

France

Siempelkamp France SARL

Australia

Siempelkamp Pty Ltd.

Singapore

Siempelkamp Pte Ltd.

China

Siempelkamp (Tianjin) International Trade Ltd.

Brazil

Siempelkamp do Brasil Ltda.

Russia

Siempelkamp Moscow

* Minority Shareholding