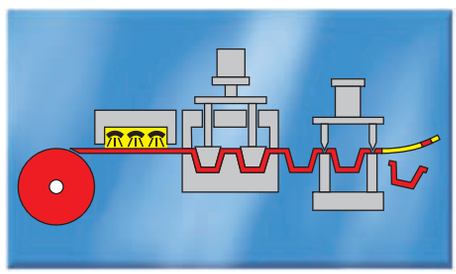
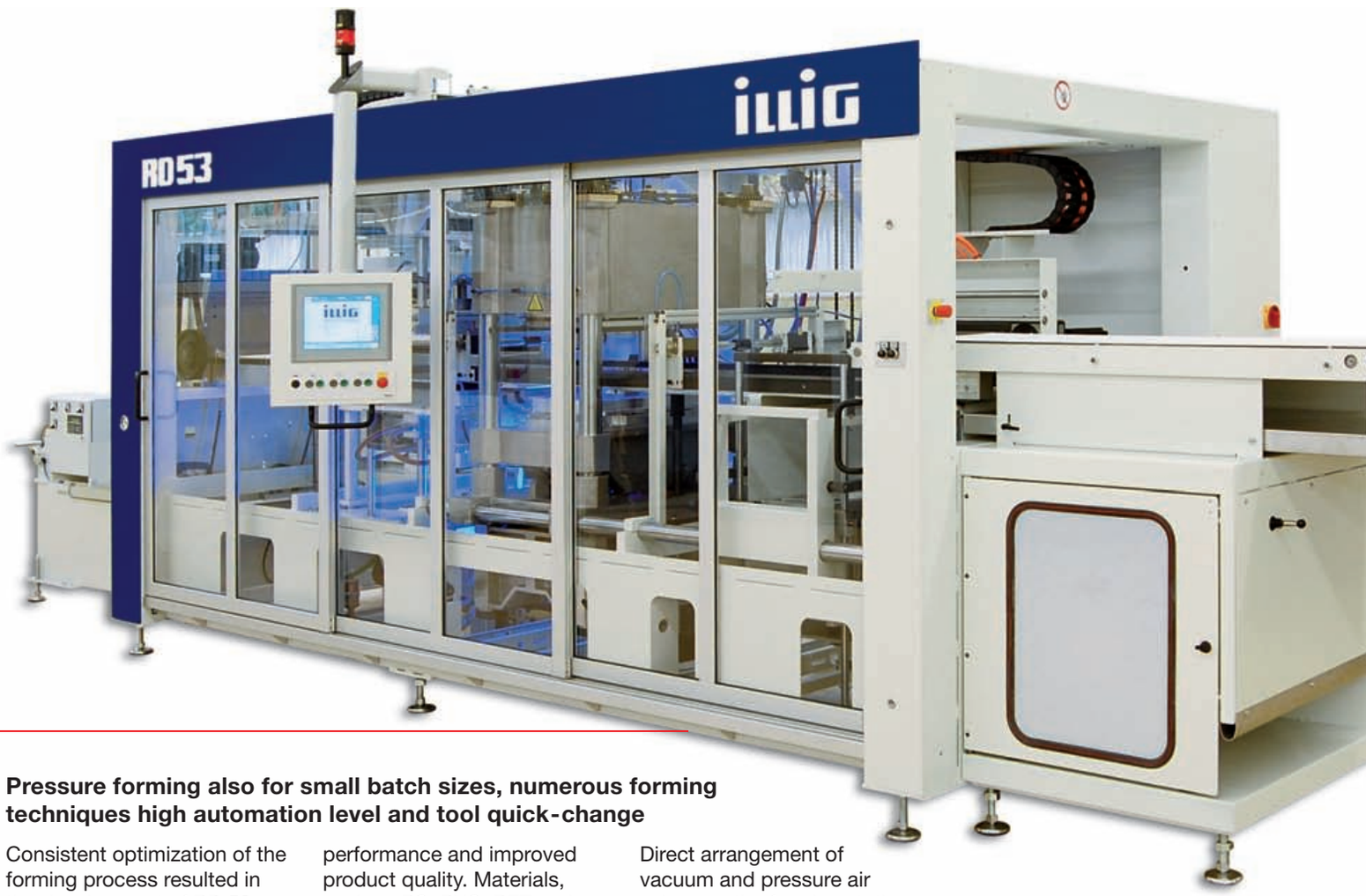


Automatic pressure forming machine RD 53c

3rd Generation
Thermoformers

ILLIG RD 53c – Innovative concept for extended pressure forming applications



Pressure forming also for small batch sizes, numerous forming techniques high automation level and tool quick-change

Consistent optimization of the forming process resulted in the development of RD 53c automatic pressure forming machine. Innovative forming programs and an optimized arrangement of all elements involved in the forming process allow for the production of sophisticated shapes up to 3 bar pressure air.

Based on newly developed standard parts inexpensive format sets are available making pressure forming economical for small batch sizes, too.

High speeds and increased automation levels of hole punch, steel rule punch and stacking units as well as a tried and tested quick-change tool technology ensure high productivity as well as reproducibility of all process parameters.

Computer-aided basic setting and optimized machine operation result in increased performance and improved product quality. Materials, such as PS, PVC, PET and PP, at a thickness of 180 µ to 1.5 mm (optionally 2 mm), can be processed on the RD 53c.

The basic machine is equipped with a heating, forming and punching station. The machine can be upgraded by an additional stacking unit.

The machine sets the standard with regard to mechanical design and ease of operation. Extensive use of servo motors and state-of-the-art control and regulation technology ensure precise setting of strokes and speeds.

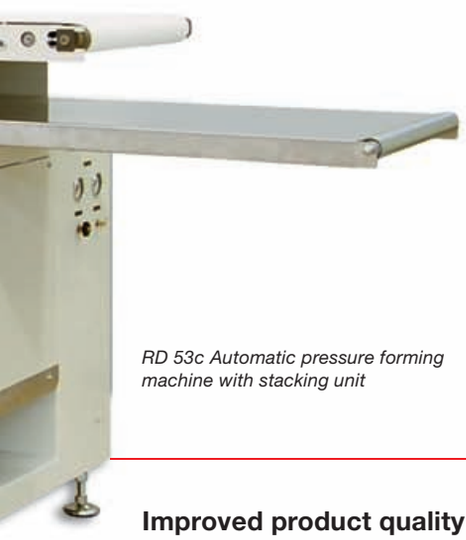
Since the forming tables are equipped with servo motor drives, table strokes and speeds in the forming station can be variably set. Different forming programs can be selected in combination with the separately driven upper and lower clamping frames.

Direct arrangement of vacuum and pressure air valves on the forming station allows for fastest filling times of the individual cavities and thus shortest cycle times.

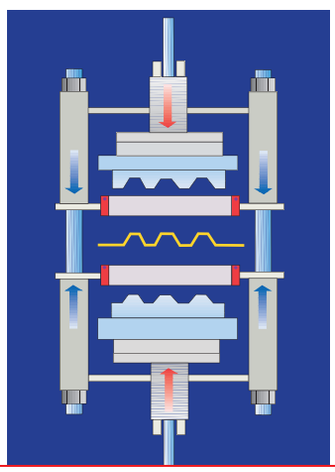
The servo motor drive of the material transport ensures even movements.

The discharge conveyor for the product stacks is synchronized with the pushing-out movements resulting in precise and vibration-free product stacking.

Formings with holes punched in the bottom require the use of a hole punch press. Retrofitting of this additional unit is not possible.



RD 53c Automatic pressure forming machine with stacking unit



Forming station with four independent tool movements. The forming tables are servo motor driven, the clamping frames are driven pneumatically.

Improved product quality and increased output due to suitable machine equipment

Forming station:

- Material roll stand with roll lift-in device and automatic unreeling device (optional extra)
- Feed for pre-heated materials
- Material transport with A.C. servo drive, hardened chain support rails and material spreading device
- Upper and lower heater with longitudinal row control, upper heater with additional individual pilot control of row of heater elements close to the tool
- Use of forming tools for positive and negative forming
- Forming station with servo motor driven upper and lower table
- Pneumatic drive for upper and lower clamping frame, strokes and speeds can be separately set, function of upper and/or lower frame selectable

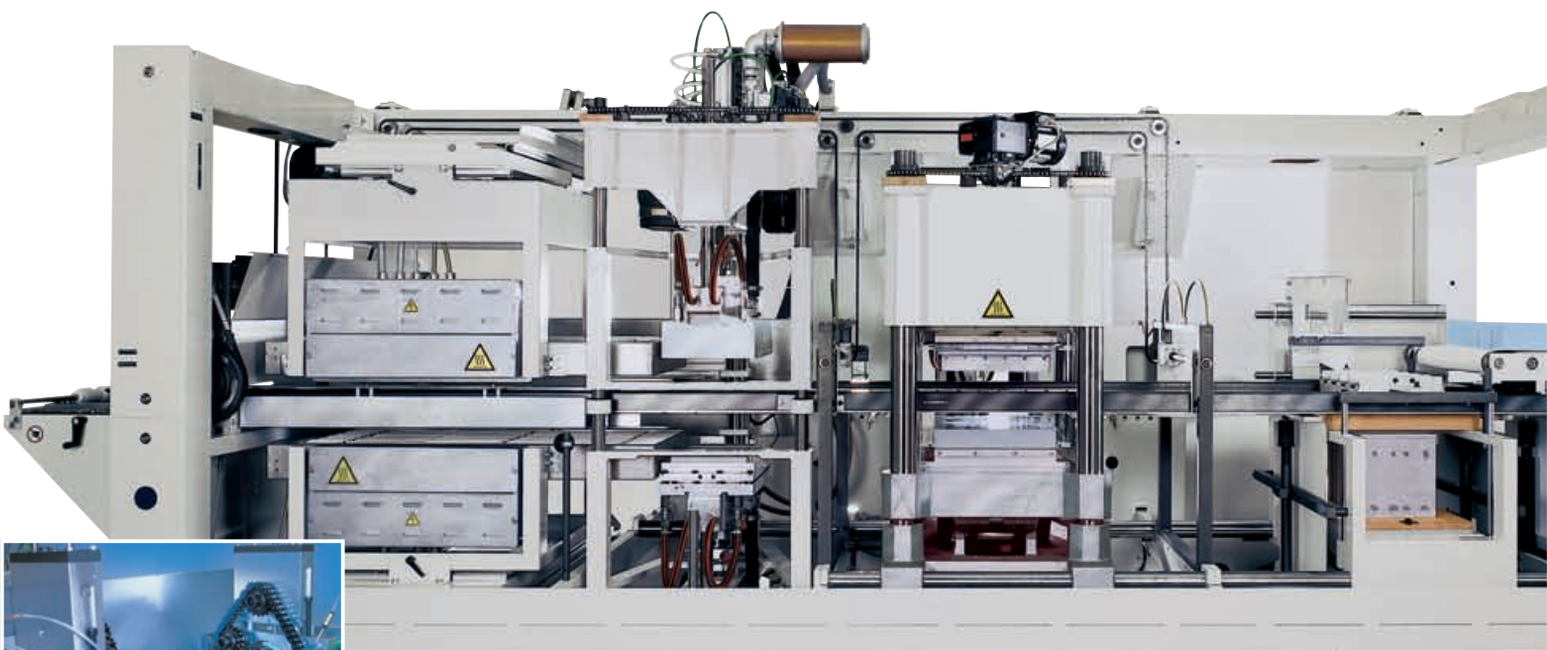
Steel rule punch press:

- Extremely resistant to bending, with servo motor driven upper and lower table
- Adjustment device (across the machine direction) for steel rule cutter during operation
- Steel rule die heating

Stacking station (optional extra):

- With counting and pushing-out device, servo-motor drive for clamping, breaking-out and pushing-out movement including discharge conveyor synchronized with pushing-out movements. The setting parameters of the servo-motor driven stacking movements can be programmed by teach-in.
- Skeletal rewinding device with pneumatic discharge device and monitoring of roll diameter

High-quality technology for excellent products



The pneumatic chain tensioning device continuously tensions the chain and thus ensures precise material transport

Servo motor driven material transport

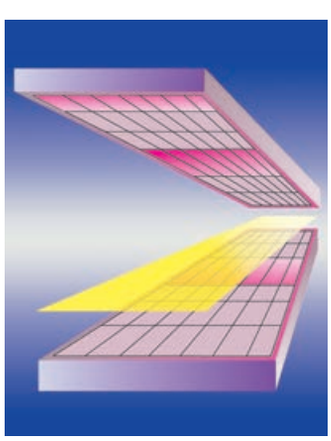
Width and index length setting of the material transport are carried out on the operating panel. The positioning drive reduces index length tolerances to +/– 0.2 mm. In the area of the forming station the material transport is moved apart pneumatically by the spreading device. The material is stretched thus preventing webbing during the forming process. This is especially beneficial for PP processing.

ILLIG heating technology, ideal conditions for thermoforming

Upper and lower heater are included as standard equipment. Each individual row of heater elements is pilot controlled. Heater element rows which are not needed are automatically switched off, subject to index length and material width. Additionally, the row of heater elements close to the tool can be regulated. This way temperature influences by forming tool and clamping frame cooling can be offset.

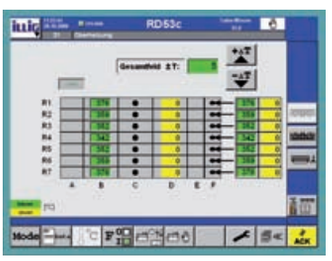
A cross heating profile is calculated by the control system with computer-aided basic setting with respect to the center row of heater elements.

All thermoforming options can be utilized with this optimized heater equipment.



Upper and lower heater are equipped with longitudinal row control. In the upper heater, the heater elements close to the tool can be additionally regulated.

Menu page forming program



Upper heater

Steel rule punch press with precision adjustment for even punching edge

The steel rule punch press is equipped with movable upper and lower table. Formings of up to 100 mm above and 40 mm below material level can be punched. Higher cycle speeds are achieved by using the servo motor drive, movements are more precise and there is no brake wear. Featuring the new drive technology, the punching tables can be moved by indexing or in various stages of creep speed. This is especially beneficial for adjustment of the steel rule cutter.

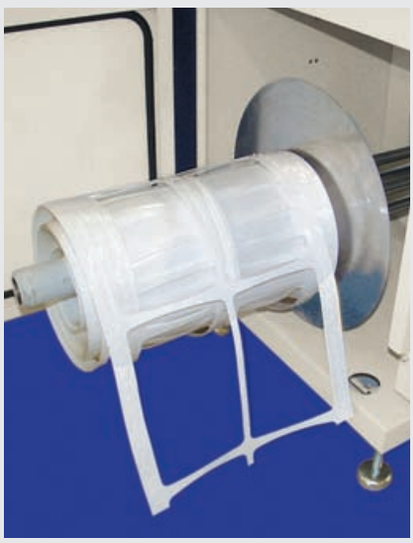
The complete station can be moved in longitudinal direction, the position is determined by the control and stored. Cross movement of the steel rule cutter is effected by an adjustment device. The positions can be altered during machine operation and saved after being optimized.

A steel rule die heating is included in the standard delivery.

Future-oriented system technology ensures shortest set-up times and flexible production

Quick-change system for forming tool

Change of steel rule cutter



Skeletal removal

Quick-change technology for complete format set makes this machine ideally suited for the production of small batch sizes

The tool change system of the RD 53c allows very rapid change times for the forming and punching tool without employing any hand tools.

The tool change is supported by the ILLIG conversion program. During the process the material transport opens automatically and subsequently adjusts to the new material width. Additionally, punching and stacking station are moved to their correct position with respect to the forming station.

All tool and format parts can be changed from the operator side. Large sliding doors facilitate operation, maintenance and conversion of the machine.

Forming station

Rapid tool change times can be achieved by using spring-mounted, pneumatically unlockable tool clamping devices in combination with the mechanic tool installation aid.

Punching station

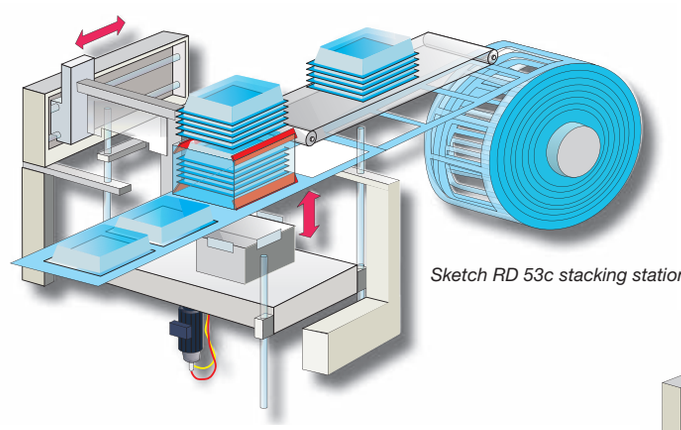
The pneumatically unlockable clamping device reduces change-over times for steel rule cutters to only a few minutes.

Change of skeletal

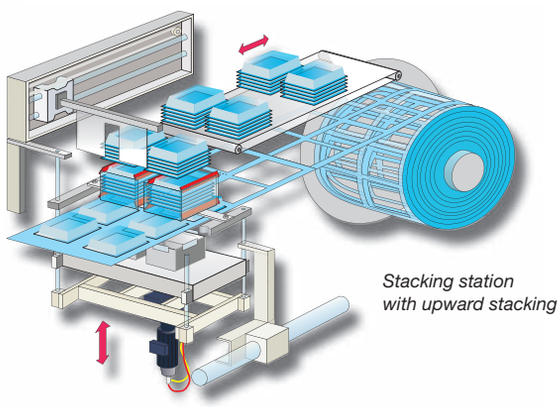
A pneumatic skeletal push-out device is available to make changes easier.

A complete change of format parts on the basic machine can be performed in approx. 15 minutes for repeat orders.

Stacking variants for all automation levels



Sketch RD 53c stacking station



Stacking station with upward stacking

Stacking system solutions adapted to customer-specific requirements

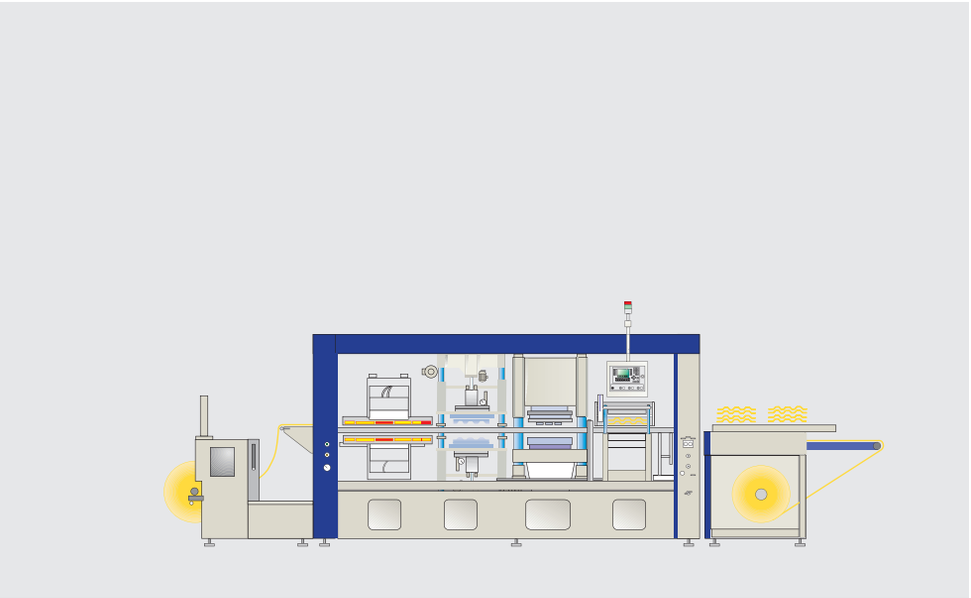
Function of stacking systems

Formed parts are stacked in upward direction into format-dependent stacking cages. The web is clamped and the formings are separated from the web by means of a break-out plug. A further movement takes the parts into the stacking cage. The respective product stacks are formed by means of a counting device. Subsequently they are moved onto a synchronized conveyor.

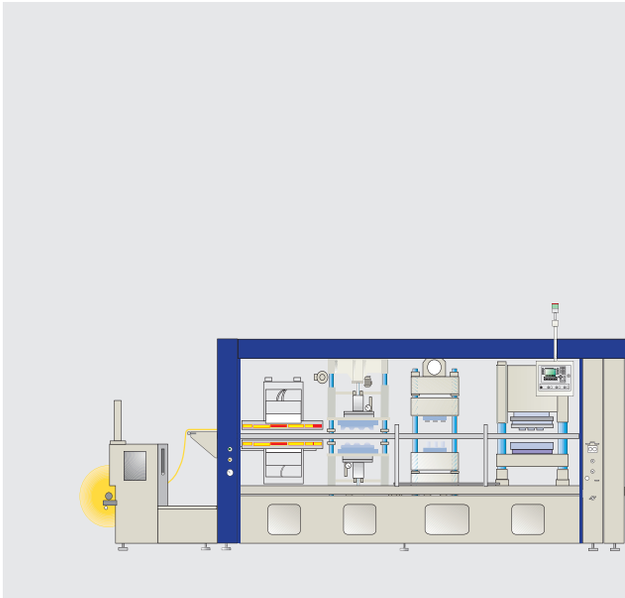
RD 53c stacking station

Higher setting and operating convenience in RD 53c due to servo drives for stacking movements. The strokes of break-out plug and push-out device can be set very easily by teach-in. The strokes entered by the operator are converted by the machine control into setting values. These values can be stored.

They reduce set-up times and result in higher efficiency with improved customer benefit at the same time.

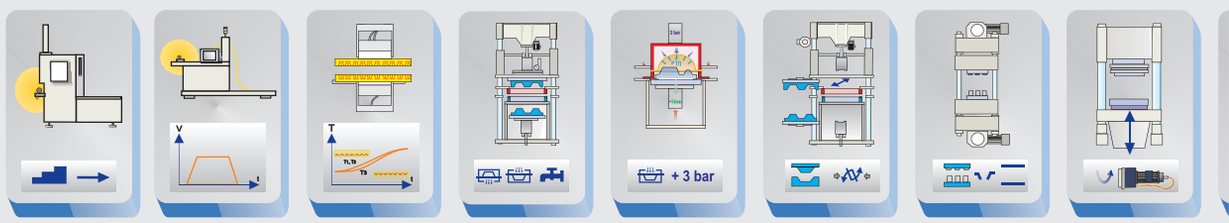


RD 53c Automatic pressure forming machine



RD 53c Automatic pressure forming machine with hole punch press

RD53c process optimized machine



Practical operating philosophy, computer-aided basic setting of machine data as well as computer-aided machine conversion thanks to digitalized machine.

Easy operation and computer-aided basic setting

Process engineering and application technology in conjunction with comprehensive material knowledge result in optimum machine programs incorporating the parameters for forming, punching and stacking.

This technology of the c-series together with servo motor drives provides calculation of optimum setting data and process times for new tools subject to material, part geometry and tool design supported by computer-aided basic setting.

The machines set the standard with respect to ease of operation.

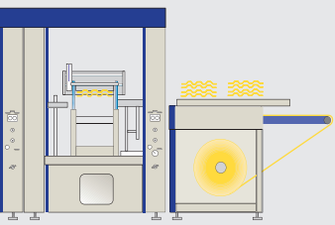
The total reproducibility of production data is a major element for maximum availability especially if automation levels and frequent product changes are concerned.

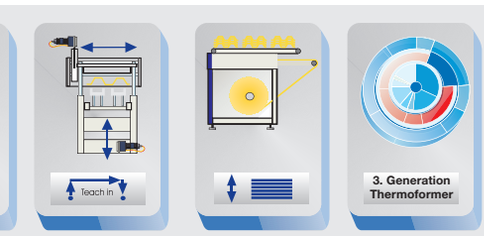
All data relevant to the production process are entered on the operating panel and displayed as set actual comparison.

The optimized data can be saved and they are available right away for repeat orders.

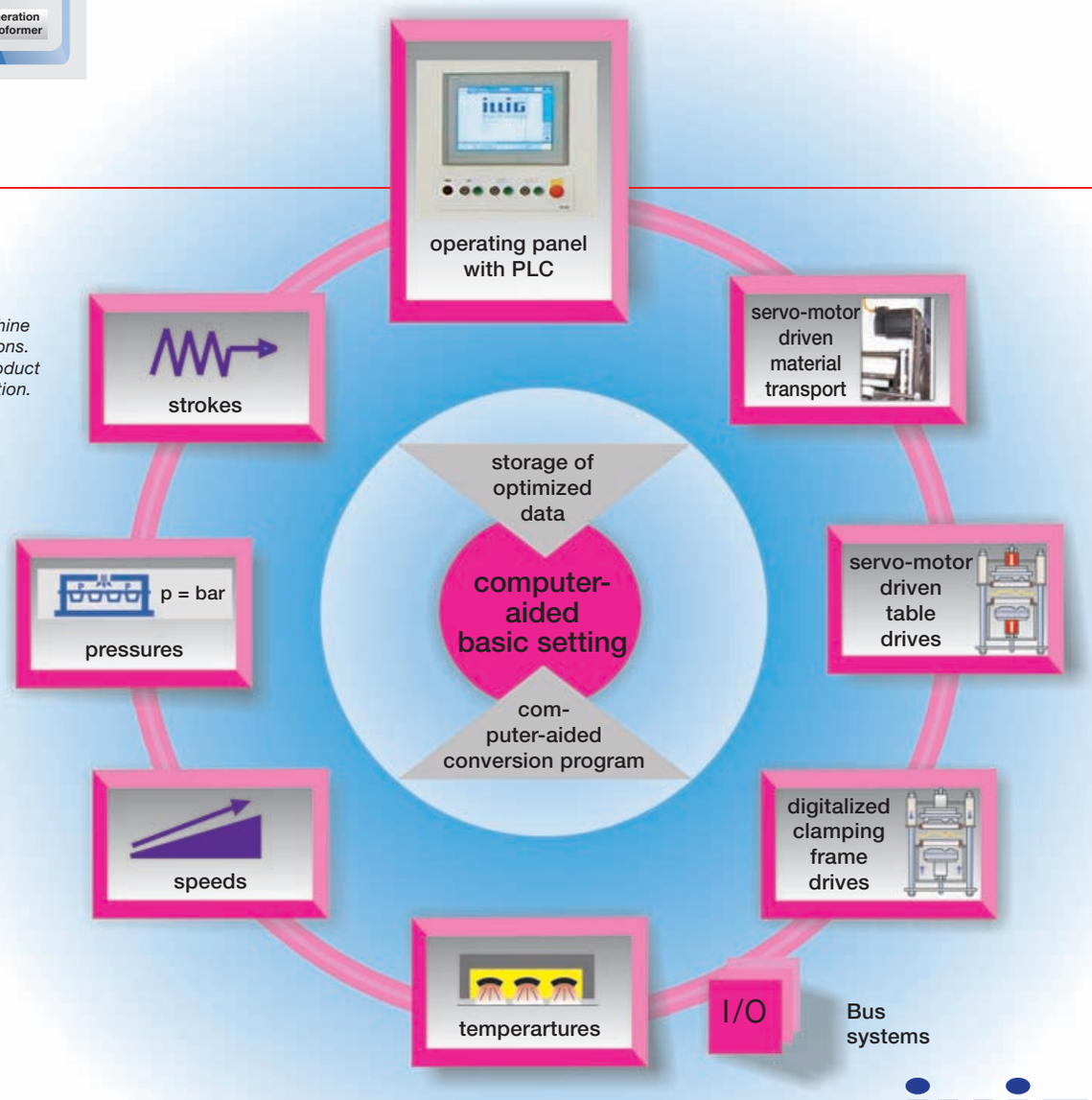
All major process parameters are permanently available to check the ongoing production.

- Siemens S7 control with screen operating panel
- Digital setting and storage of production parameters, thus reproducible thermoforming process
- Material transport with servo drive and pneumatic adjustment
- Optimum material heating
- Servo-motor table drives

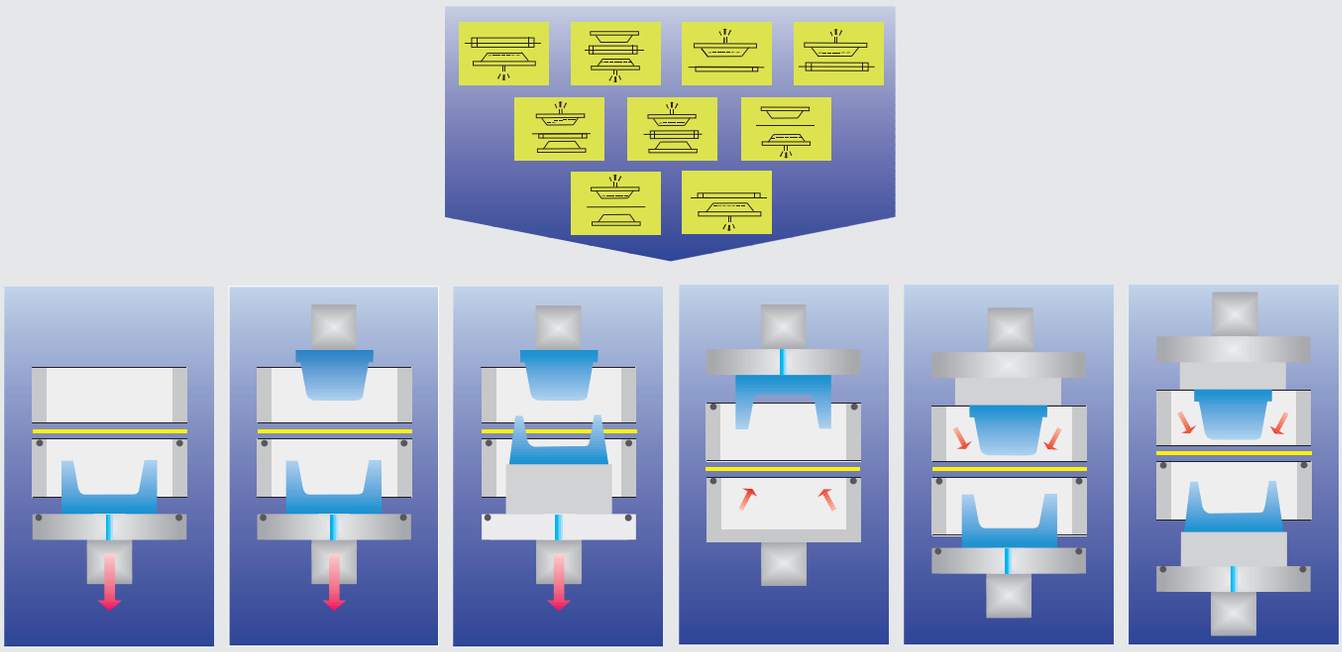




Computer-aided setting of machine data thanks to digitalized functions. Higher output and improved product quality due to process optimization.



Numerous tool design options



Examples out of 22 tool design options

Production variety by selecting from a multitude of forming programs

Flexibility due to a various tool design options

The forming station features four independent tool movements. Forming tables are moved by servo motors, clamping frames are moved pneumatically. Twenty-two tool design options result from the nine forming programs installed as well as various movement sequences.

Unique tool design

Construction parts developed with the machines are available as standard parts for forming tools, clamping frames and stacking format parts. Additionally, forming segments made of aluminium precision-casting can be used to build forming tools.

With this simple tooling system, all machine options can be used to the maximum extent result-ing in economical production even for small batch sizes.

Longer service lives of steel rule cutters by increased flexural strength of steel rule punch press

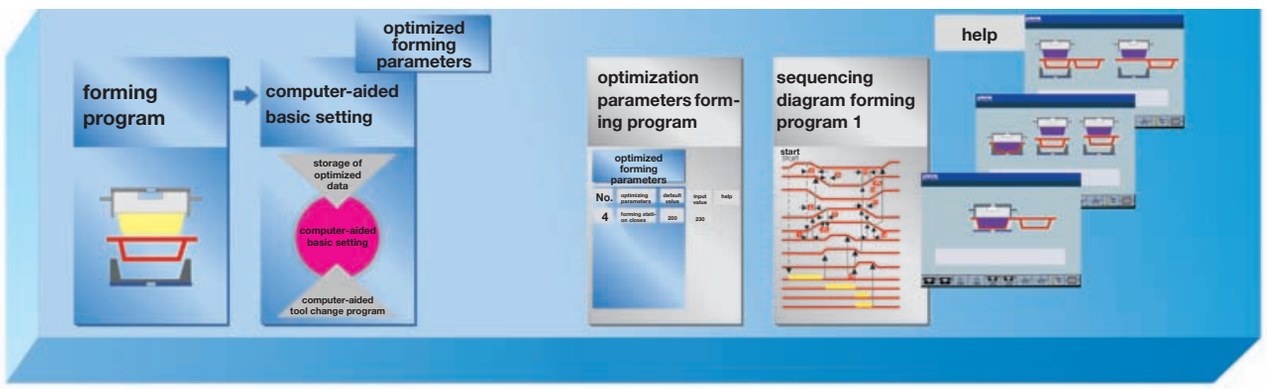
Very simple steel rule cutters are employed which are either wood-mounted, unheated and consequently very inexpensive or aluminium-mounted. Cutting forces are reduced by using heated steel rule dies.

Menu page Tool removal/tool installation

Menu page Tool removal

Menu page Tool installation

High performance, high product quality



optimization product quality → **3rd Generation optimization of sequencing and performance**

Free potentials of movement sequences are systematically converted into increased cycle speeds

Screen page "optimization parameters forming program" The operating philosophy includes a structured operator guidance on the screen through the individual menu pages.

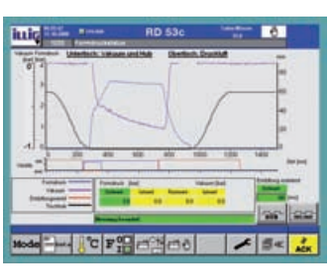
Operability is kept on a manageable level for the operator in spite of numerous and complex processes. The process parameters are automatically integrated in process sequences and flexible movement profiles and as a result we achieve a process-optimized manufacturing sequence with faster production cycles and constantly high product quality at the same time.

3rd Generation Thermoformers provide an optimization strategy thanks to the innovative functional program structure which is employed to improve performance, product quality and production reliability at the customer in a well-targeted way.

Newly developed menus provide systematic operator guidance through the individual optimization phases. Parameters relevant for performance are provided automatically to the operator in a selective way, subject to the forming program of the machine, for optimizing purposes. Consequences of the measures taken are displayed on a newly developed screen. The main benefit of this visualization is the selective display of required information and auxiliary functions based on principles of professional industrial design.

Operating mistakes are avoided thanks to a clear and simple menu structure.

Easy and comfortable navigation through individual menus can be selected on the operating panel. The dialogue system also features an electronic help function included in the operating system.



Screen page "status of forming pressure"
Display of process sequencing in tool.

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