

**Thermoforming machine
Type UAR 155g
Suitable for processing
of rolled stock**

Process controlled machine



Advantages UAR air ducts

Functionality decides

Offer better quotations with quality and high utility value. Thermoforming enables production of demanding air ducts for the automotive industry.

The air ducts produced in the twinsheet method fulfill best the requirements of the automotive industry as far as weight, low noise of air flow, thermal stability, inhibition of water condensate and complex 3D design are concerned.

The essential advantages of this procedure are:

- Production of air ducts at best quality now
- Producibility of even big (long) ducts
- Multiple layout of forming area
- Forming and punching (of weld seam contour) in the same tool
- Relatively short cycle times per drawing part

The advantages of the use of a large area thermoforming machine like the UAR 155g are:

- Production of long and/or large area parts
- (Nearly) any layout of forming area of little parts

Application of twinsheet procedures

In many vehicles air ducts are used to conduct cold and warm air. The essential requirements on these air ducts are thermal stability, weight, low noise of air flow and last but not least an often demanding 3D design. All these demands can be realized by the twinsheet procedure. After the heating up process two PE or PP foam materials are formed in two tool halves and are immediately welded with each other. Punching is effected in the same tool. This enables considerable rationalization by omission of a following processing step. Forming and punching in one tool guaran-

tee high accuracy of positioning and repeatability at minimum punching mismatch. With the UAR 155 g ILLIG includes a well-proved thermoforming machine in its range of machinery for such kind of applications. The UAR 155g works with a entirely new procedure completely without frame.

Besides the air ducts, of course, many other applications can be realized, also with other materials.



- Functionality decides
- Process controlled machine
- Forming machine and Loading device
- Forming tables and cooling
- Simple operating philosophy
- Tools and availability



images left: different twinsheet applications

Profitable production by process optimization

Repeatability

The setting data of the thermoforming machine and of the additional devices are available any time and enable quick restart after a change of finished jobs at constantly high quality.

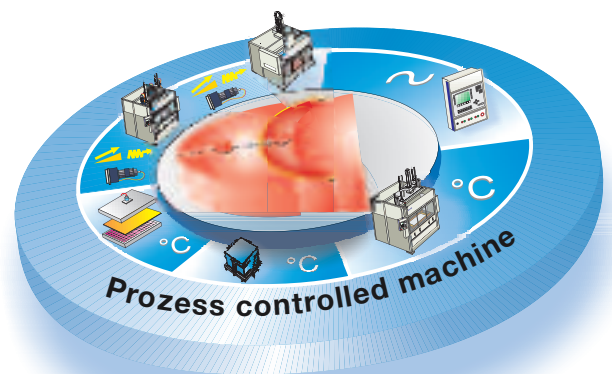
Temperature controlled heaters in working and resting position

This is backed by the ILLIG heating philosophy with a temperature control in any operating mode according to the principle: controlling instead of setting.

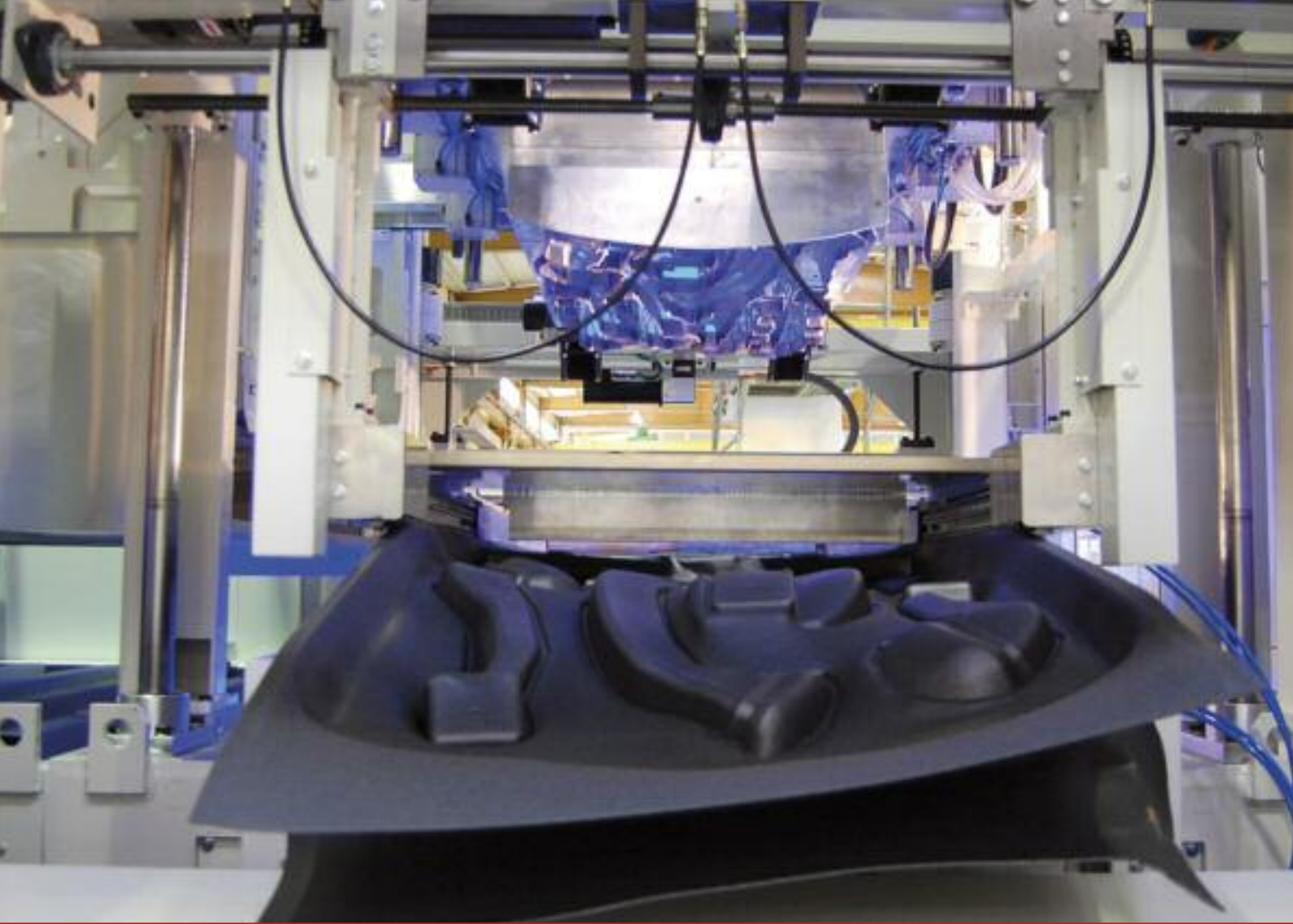
Minimizing production costs of product

Shortest conversion times by change of format parts in a package increase the productive life of the machine.

All features contribute to the fact that the required performances are fulfilled in correspondingly high quality and the profit is maximized.



**Process controlled machine –
A future technology of ILLIG**



Forming tables and loading device

The UAR 155g is a thermoforming machine suitable for forming and punching of twinsheet parts in the forming station. This machine concept works without clamping frame.

The forming machine was derived from the ILLIG UA machines proven over decades. All known advantages of this series are taken into account. For specific applications of this machine essential features were modified, so for example the drives of upper and lower table as well as the loading

device. The forming station is protected by a protective sliding door of safety glass on the operating side. This guarantees optimal protection against draft. Draft can negatively influence the quality of the formed part and is almost avoided completely.

The loading and discharge device are firmly linked with the thermoforming machine. It is provided with a servo-driven double material transport with tooth chains for two material bands, servo-driven transport width adjustment and servo-driven height

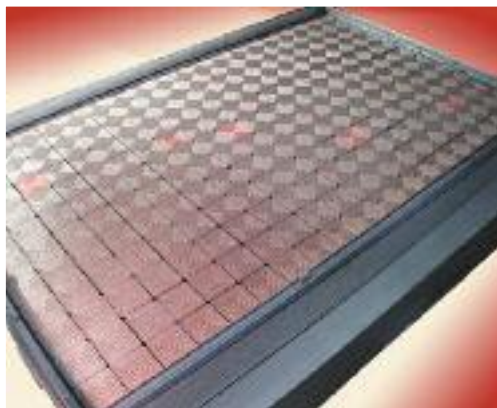
adjustment for each the upper and the lower material transport.

The rolled material is drawn off by two rolls and processed.





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High temperature ceramic heater elements (HTS)

Temperature controlled heater for optimal production parameters

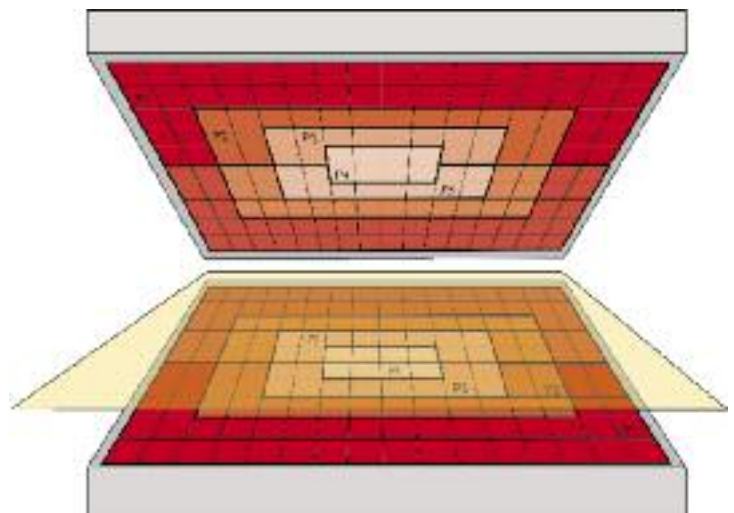
The gentle and even heating up of the material is the key for a good forming result. The heaters are equipped with high-temperature ceramic heater elements (HTS).

There are universal heater properties i. e. even pre-printed materials can be heated up evenly. The heating times necessary are independent of the color of the material.

High efficiency is achieved on account of the complete arrangement of the ceramic heater elements. This guarantees optimal heating up of the material right up to the edge area. Upper and lower heater with joystick division of heater area are part of the basic equipment.

It is most simple to change the heater layout. Furthermore the machine can be equipped with IR measuring technology (Infrared).

Thereby a heater layout is achieved which is optimal for the thermoforming process. The temperature control of the heaters is carried out by several pilot heater elements and superimposed performance set in percent.



Temperature controlled heaters with pilot heater elements for optimal production parameters.



Forming tables

Upper and lower table are equipped with servo-drives having a closing force of 120 kN.

These drives are designed for speeds of up to 500 mm/s.

The settings of the servo-drives can be stored. This enables complete repeatability of the sequences and thus influences directly the quality of the formed part.

Furthermore servo-drives are more efficient than hydraulic or pneumatic drives and thus contribute to reduce the costs.

Other advantages are for example reduction of chill marks and faster movements, which result in shorter cycle times.

The upper position of the upper table can be changed, so that travel time of upper table is reduced additionally.

Both forming tables are provided for quick tool change.

The settings of vacuum and demolding air on upper and lower table are each carried out by a servo-driven valve. Herewith the cross sections of the valves can be infinitely adjusted from 0 to 100 %.

These settings can also be stored and enable complete repeatability, which directly affect the quality of the formed part. A always optimal availability of the forming vacuum is guaranteed by two heavy-duty vacuum pumps for which monitoring system can be supplied.

Loose parts controls for both forming tables enable actuation of function units in the tool.

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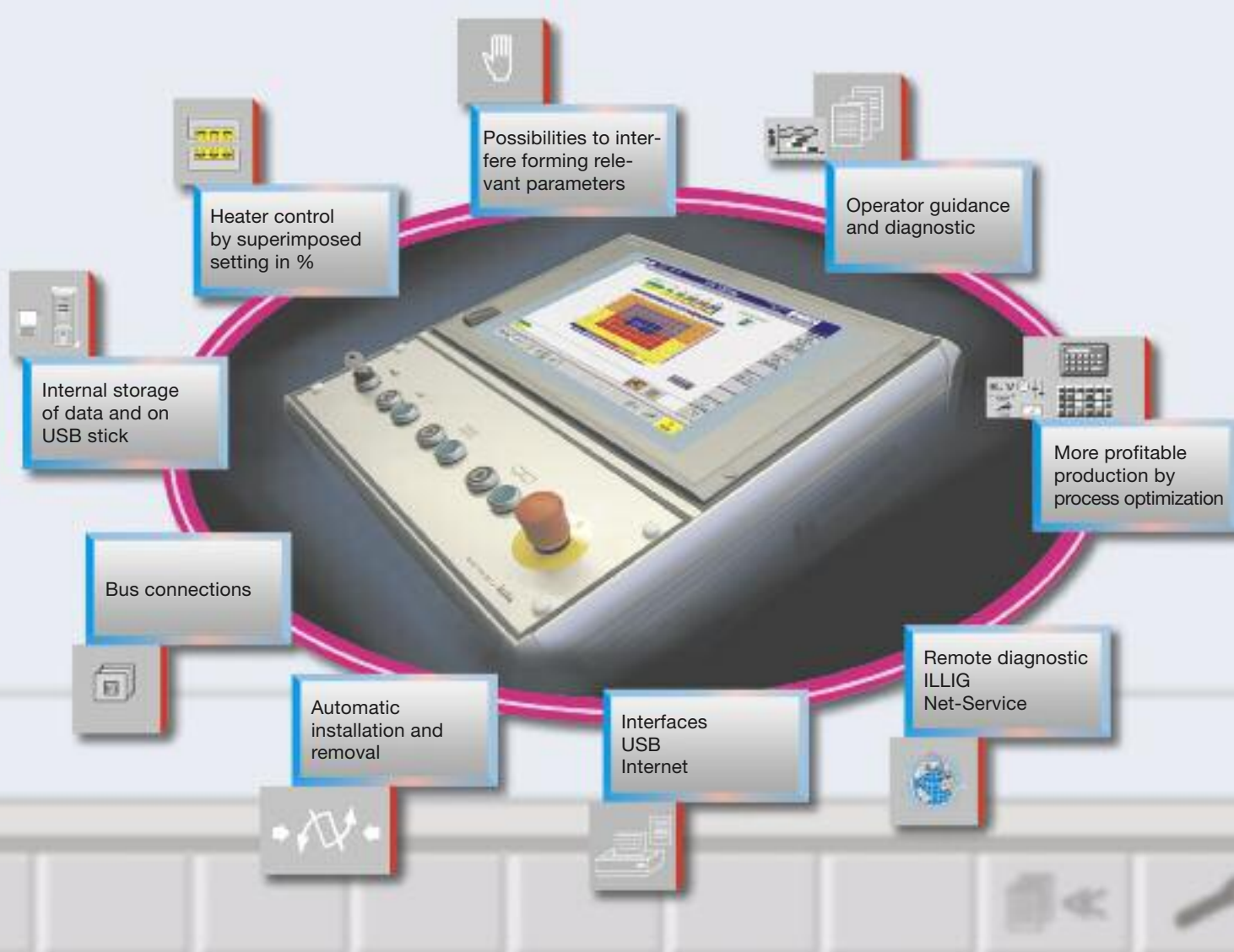
Cooling

Cooling has a direct influence on the cycle time. Since it is not possible to cool the twin-sheet parts by common fans, for both tables flushing air connections are available. Herewith the formed part is cooled from inside by compressed air.

The mostly required combinations of temperature connections can be supplied. By these temperature connections the forming tools are provided with cooling agents, they can be directly controlled by the operating panel of the machine.



Upper part twinsheet
Forming/Punching tool,
Cutting knife moved out



Simple operating philosophy

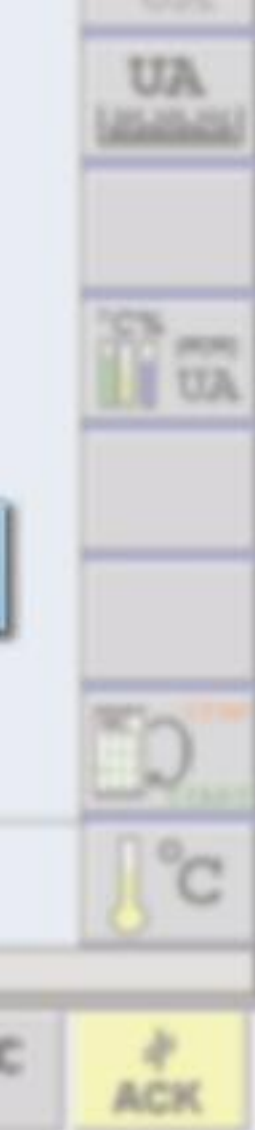
Simple machine operation

The complexity of the process during thermoforming demands a perfect control technology where the process parameters are controlled and optimized. New is a user interface, which enables specific operator guidance through the individual process phases.

The number of the adjustable parameters is reduced to a minimum. The affects of the settings are displayed on the user interface.

Advantages by Siemens Panel-PC

- Newly developed machine control with Soft-PLC based on the Windows operating system
- Screen operating panel with high-contrast, bright Touch-TFT Display for simplified operation and improved readability
- Changes in the sequences with automatic take over of the interference (Teach in) into the controls: "Heating time upper heater", "Heating time lower heater in forming station", "Full vacuum delayed off". If the operator interrupts these functions by soft keys, the machine control takes over the time as set-point value for the next cycle and stores these data in the sequence program
- Active function control of heater element
- Graphical display of heater element temperatures
- Contact free actuation of heater element
- Diagnostic support
- Visual display of forming process
- Automatic switching on of heater shields in advance as well as temperature control of forming tool
- Printer connection. Setting data and production report can be printed out
- The setting data can be stored on hard disk or USB stick



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*Operating panel UAR machines.
Digitized function sequences enable field-proven
operating philosophy of machine functions.*

Intelligence based on PC

High demands are required nowadays from production machines as far as accuracy and repeatability are concerned. This is the only way to fulfill the high quality demands on the formed parts. For the thermoforming machines this means: Show properties as are already standard on the 3rd generation machines, the process controlled machine.

The control systems and regulation strategies as developed by ILLIG, guarantee easy production sequences with high availability and operator friendliness.



*Menu pages for operation
guidance for optimization of the
process controlled machine.*



Minimal conversion times

For this machine series the ideal combination of the tool change variants proven in the field was selected.

Upper and lower tool are pushed together into the forming machine by roller conveyor. There the lower tool centers automatically and is clamped by vacuum onto the lower table. This clamping vacuum is controlled automatically. The upper tool is fixed to the upper table by automatic mechanical lock. In addition, several metal shields are fixed manually. Then the installation process is finished.





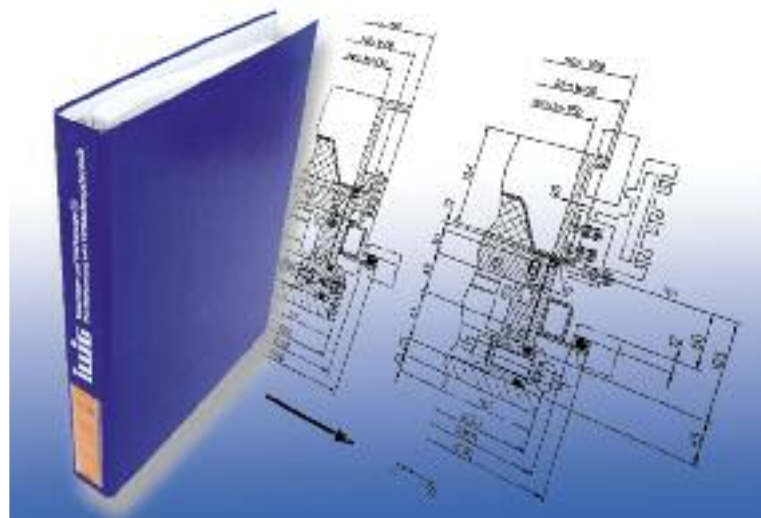
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Availability and productivity have first priority

Reduced change times for tool and format parts, simplified operation and higher availability are further advantages of the ILLIG thermoforming machines. Nonproductive times like tool change times as well as servicing and maintenance are accordingly reduced to a minimum.



A special manual for mold making of ILLIG for the construction of molds and tools enables the user to independently develop tools and tool parts.



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SYSTEMS
for Thermoforming and Packaging Technology

Sheet processing machines
Automatic roll-fed thermoformers for forming/punching tools
Automatic roll-fed thermoformers, separate forming and punching
Skin and blister packaging machines
Form, fill and seal lines
Produced Tooling