

power
in plastics processing

KIEFEL GMBH
GERMANY

A Member of Brückner Group

MACHINES FOR
PLASTIC PROCESSING FOR THE

REFRIGERATOR INDUSTRY



INLINE THERMOFORMING MACHINES FOR REFRIGERATOR INTERIOR LINERS AND DOORS

KIV/KID SERIES

TECHNOLOGY WITH **STRONG ADVANTAGES**

- **Servomotors** and **standard three-phase motors** for all process-relevant movements
- **Quartz heating elements** with CLOSED LOOP temperature control by means of pyrometer to ensure a constant sheet temperature



Quartz heating elements for fast, efficient heating of plastic sheets

- Vacuum/compressed air and mould release air regulated by **control valves and proportional valves**
- Prestretching height of the plastic sheet precisely and consistently defined by means of **laser sensor**
- **Pressure forming** controlled by special table-to-table locking mechanism (KIEFEL patented)
- **Inline perimeter trimming** for inside liners and door liners, **separation cutting** for all applications

CONCEPT **HIGHLIGHTS**

- Fast movements and optimized cooling to reduce machine time with direct impact to overall cycle time to a minimum > **high production yields**
- Low energy consumption thanks to motor drives and quartz heating elements > **low production costs**
- Minimised sheet formats and maximum waste reduction guaranteed by chain-guide conveyor and automated start sequence > **savings on raw materials**
- No need for manual finishing of cut products thanks to high cutting accuracy > **savings on labour costs and time**
- Machines can be adapted to work with existing production tools > **lower tool investment costs**
- Fast tool-change system permits rapid product changeovers > **higher productivity**
- Modern connection to KIEFEL Service Centre > **short reaction times minimise machine downtime**

THE KIEFEL KIV/KID SERIES IN **OPERATION**

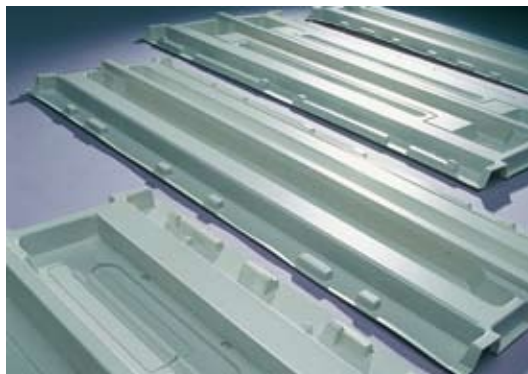
Typical applications include the manufacture of components in PS or ABS:

- Refrigerator inner liners
- Refrigerator door liners
- Refrigerator door exteriors



MORE **APPLICATIONS**

Various plastic materials, such as PVC and PET panels, can also be processed.



Housing and cover components can likewise be manufactured using the KIV/KID machine configuration



INLINE THERMOFORMING MACHINES FOR REFRIGERATOR INTERIOR LINERS

The latest generation of Inline Thermoforming Machines has been especially designed for the efficient production of refrigerator interior liners made of PS or ABS.

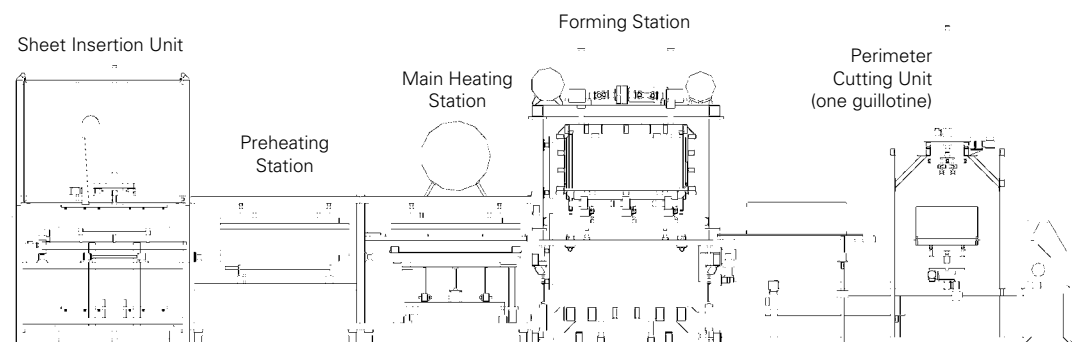
The overall production process includes the loading of the plastic sheets from the stack, and the heating, forming and trimming of the components to create the finished thermoformed product.

Servomotor table drives ensure precise, repetitive process sequence from the first cycle! The forming station can also be designed for combined pressure/vacuum forming.



MACHINE CONFIGURATION

- Vacuum-forming or combined pressure/vacuum forming
- Pre-blow or pre-suction technique used for pre-stretching of plastic sheet
- Production process only for "forming", or including items ranging from the integrated perimeter cutting station to additional cutting stations for separating and/or alternative finishing purposes

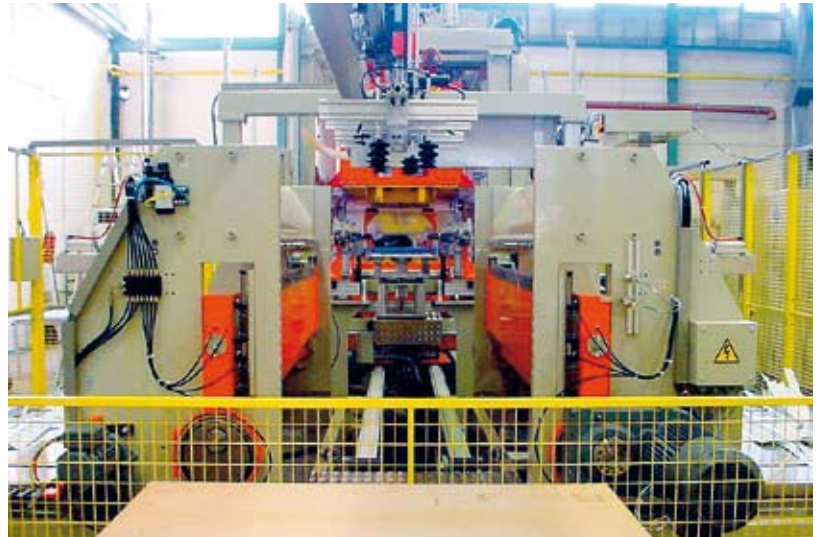


INLINE THERMOFORMING MACHINES FOR REFRIGERATOR DOOR LINERS

The units designed for the production of refrigerator-door liners are based on the innovative machine modules used in the manufacture of refrigerator interior liners.

The addition of special items of equipment permits the processing of door liners in PS or ABS.

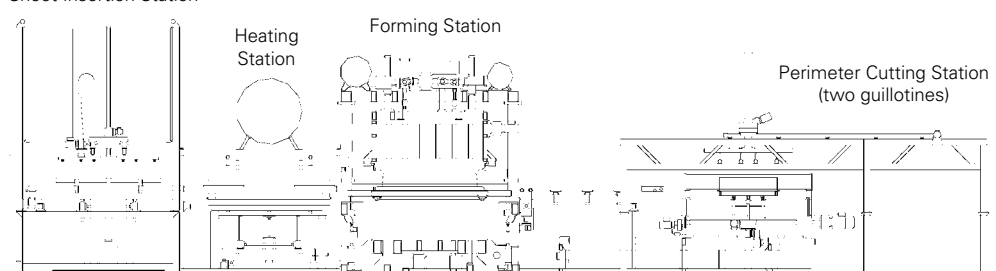
Two motor-actuated guillotines ensure fast cycle times with consistently high cutting quality



MACHINE CONFIGURATION

- Main heating station with quartz heating elements: The highly efficient heating process means that various applications can be handled using a single heating unit, without any extension of the cycle time. A pre-heating unit with quartz heating elements can be used as required.
- The forming station unit with pre-suction/pressure bell can be configured with a motor-actuated upper plug for auxiliary forming aids in the bell.
- Perimeter cutting station with two guillotines

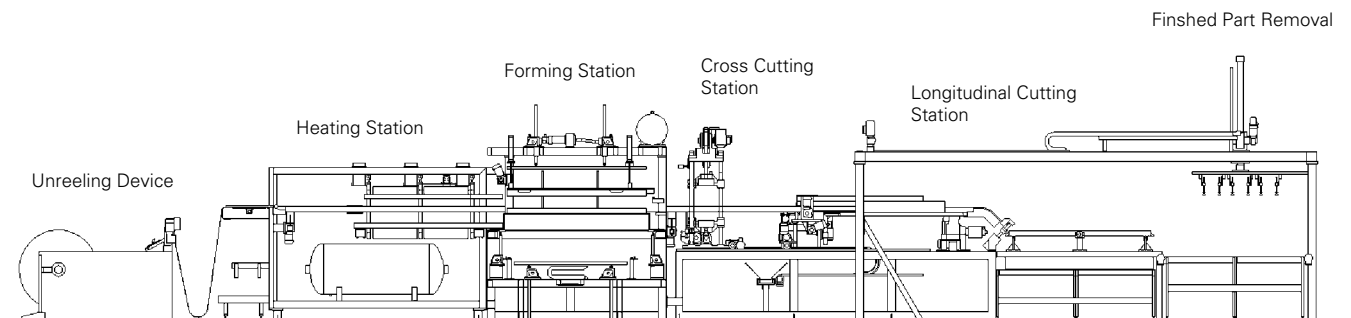
Sheet Insertion Station



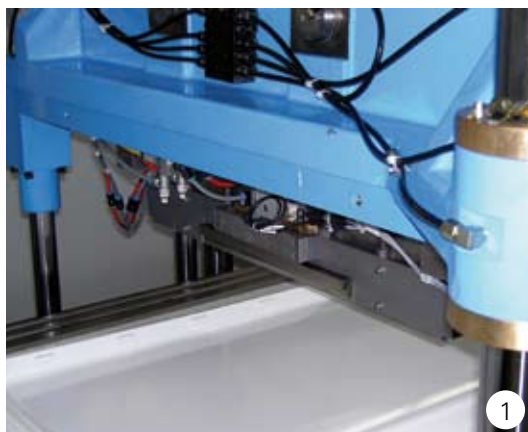
ALTERNATIVE SOLUTIONS FOR DOOR LINER

The Door Liner parts are due to design and lack of rigidity a challenge to trim.
 In addition to the Guillotine system concepts with potential to improve cutting performance, but not limited to that.

REFERENCING THE FORMED PART



Working from coil is possible with common door liner thickness.
 Sheet separation – a potential downtime source – not an issue.



The part length will be trimmed with a die only after laser has detected the exact position (1)

The width of the door liner is done with roller knives with permanent guidance on the formed contour. (2)

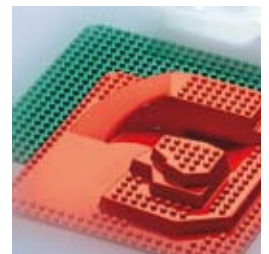
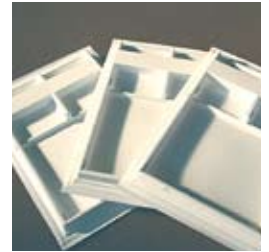
Double or even triple cavity mould layout can be handled.
 Final perimeter trim, parts ready to fit into metal housing.

MAXIMUM PRECISION WITH COST-EFFICIENT TECHNOLOGY

THE KIEFEL BFS SYSTEM

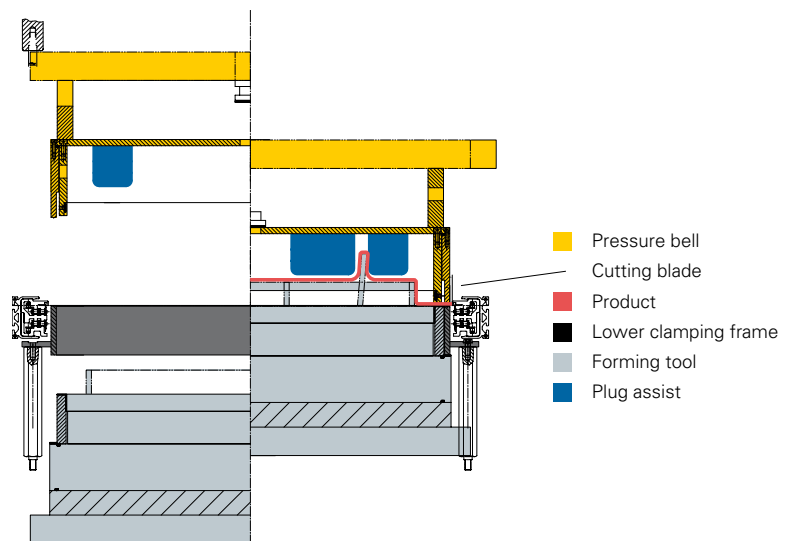
This forming and cutting technology has been applied for more than 15 years to the manufacture of high-quality technical parts and packaging articles. It has now become possible to apply the technique successfully to the precision-cutting and manufacture of refrigerator-door linings.

The automatic pressure forming machines of the KMD range are your guarantee of maximum precision and optimum processing speed. Outstanding quality and output rates can also be achieved in the production of refrigerator interior components.



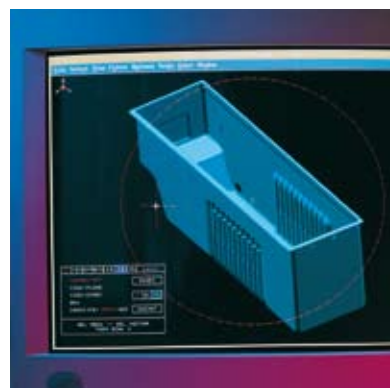
FUNCTIONING PRINCIPLE

Combined vacuum/pressure forming with connected steel-strip punching, mould-release movement in the tool and plug assist can all be carried out without problem.



KIEFEL KNOW HOW

- Mechanical and electrical design, plus high in-house manufacturing capacity
- Machines and tools are put into service by process technicians with ample experience in the implementing of turnkey projects
- Tools produced in-house by our own team of toolmakers
- Specialists in after-sales service and the supply of spare parts



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With the power it takes

KIEFEL is a producer of series and special-purpose machines for processing plastic materials, specialized in the forming and joining technologies. The perfected technology, the high economic efficiency and reliability of our machines are highly appreciated by our customers in the most varied industries all over the world.

KIEFEL is a partner of the automotive industry, the stationery industry, the medical technology, the refrigerator and the packaging industries.

The headquarters of KIEFEL is in Freilassing/Germany, and the firm runs subsidiaries in the United States, France, Austria, the Netherlands, Czech Republic, China and Brasil.

KIEFEL is certified to DIN EN ISO 9001:2000 standards.

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