DIVERSE APPLICATIONS
EFFICIENT SOLUTIONS.
Over the past few years, we’ve produced over 125 MACHINES and 500 TOOLS. We have been forming reliable production solutions for many years. Our thermoforming technologies offer a variety of options to help increase efficiency. Both rolled foils and sheet materials can be used to produce decorative trim parts.

During deep drawing, thermoplastic materials are warmed and contour formed. Vacuum laminating, on the other hand, involves heating a TPO or PVC foil and vacuuming it to the substrate, where it is then glued. IMG (in-mold graining) is possible with both processes, meaning the desired grain of the decor is incorporated into the tool shell and imprinted on the surface during the forming process. Most FRIMO machines are capable of having one or more of these processes integrated.

Starting in the development phase, we use 3D simulations and visualization technologies to optimize your series process parameters and shorten start-up times. A variety of patented FRIMO concepts help with energy and material savings. Our extensive standard thermoforming machines can also be equipped with many additional features. It is important to us that your equipment offers the highest possible operational availability and is ergonomically optimized for your operators, regardless of whether they’re producing small or large quantities. You can only satisfy your customers’ requirements in the long run with well-engineered processes that are specifically developed to suit your needs.

The FRIMO Augmented Reality App allows you to gain exciting 3D insights into our technologies. Simply download the app and scan the images labeled with the app icon!

Why FRIMO? Your advantages:
- Custom machine concepts
- High-quality, extensive standard equipment
- Numerous expansion options
- Mature, field-proven technology
- Patented FRIMO concept for material and energy savings
- Quick return on investment
- Highly productive and reliable
- Smart Service
WHY IS THERMOFORMING A GOOD CHOICE?
REACH OPTIMAL PRODUCTIVITY AND AVAILABILITY WITH FRIMO MACHINE AND TOOLING TECHNOLOGY.

A machine for every process

Thermoforming is an attractive option for producing premium surfaces. This proven and robust technology and its many possibilities are more relevant than ever. Innovation topics, such as autonomous vehicles, will have a lasting influence on future automotive interior designs. At the same time, the number of vehicles with individualized model and interior variations continues to rise, and with it the demand for flexible, all-purpose production processes. Our deep drawing and vacuum laminating machines position you perfectly to fulfill these requirements.

Our machine concepts stem from decades of continuous development and offer technical solutions that allow them to be highly productive and efficient.

FRIMO Machine Portfolio
- EcoForm single-station machines
- EcoVarioForm in-line machines
- VarioForm in-line machines
- IMG deep drawing/laminating machines
- FullFlex machines
- SheetFed machines
- Combined IMG-capable thermoforming and vacuum laminating machines
- In-line machines
- Multipurpose Machines (MPMs)
- Rotatory machines
- Specialty machines
- Tool change systems

FRIMO Tooling Portfolio
- Deep drawing tools
- Vacuum laminating tools
- Vacuum laminating with integrated edge folding (i.e. snap stroke)
- IMG deep drawing tools
- IMG vacuum laminating tools
Application
- Used for low and medium production volumes
- Flexible, economic, competitive solution
- IR emitters heat materials quickly
- Intelligent heat controls TSHC (Time Shifted Heat Control)
- Pre-blowing/pre-suction/air support
- Electric controls for upper and lower platens
- Choice of one or two upper platens
- Various clamp frame designs (rack, 3D, electrically adjustable)
- Variety of material feed options
- Numerous expansion options

Why FRIMO? Your advantages:
- Compact, modular construction
- High-quality, extensive standard equipment
- Energy-efficient heating system (TSHC)
- Capable of processing diverse rolled foils and sheet materials
- Ergonomically optimized handling
- Quick, easy tool change
- Can be moved with a forklift

ARE YOU USING SHEET MATERIALS OR ROLLED FOILS? BOTH OPTIONS ARE POSSIBLE WITH THE FRIMO ECOFORM THERMOFORMING MACHINE.

We recommend our FRIMO EcoForm machines for efficient low to medium-volume production. With this standardized single-station machine, you can deep draw and vacuum laminates both rolled foils and sheet materials, and even incorporate in-mold graining (IMG).
FRIMO VarioForm in-line machines are a perfect fit for economically deep drawing or vacuum laminating. No matter which model you choose, cycle times for producing premium decorative trim parts for automotive interiors can be greatly reduced.

EcoVarioForm with swivel-shift platens
- High-quality extensive standard equipment
- Economically optimized solution
- Compact in-line machine for cycle times of 60 - 80 seconds
- Ergonomic part handling with swivelling platens
- Pre-suction cavities and closed machine construction create a shielded process
- Easy to relocate
- Low space requirement

VarioForm in-line machines with sliding or turn table
- Flexible production system
- Suitable for a large spectrum of parts
- Cycle times from 40 seconds
- Up to four upper platens for production (turn table concept)

WHICH WOULD YOU LIKE? MAINTAIN HIGH PRODUCTIVITY WITH FRIMO VARIOFORM THERMOFORMING MACHINES.

Why FRIMO? Your advantages:
- Numerous expansion options:
  - FRIMO Advanced Cooling System (FACS)
  - IMG-capable
  - Precise heating system - Time Shifted Heat Control (TSHC)
  - Demand-oriented tool change system
  - Substrate pre-heating
  - Production and processing of blanks
  - Automatic part handling
- Patented process-optimizing chain rail for maximum material savings
- Process tracking/control through control panel
- Specialty solutions (3D motion chains, gripper systems, etc.)
- Smart Service
WANT A PERFECT GRAIN WITHOUT HAVING TO COMPROMISE? FRIMO IMG TECHNOLOGY WILL HELP YOU ACHIEVE IT EFFICIENTLY.

A high-quality look and feel, along with innovative technology, play a big role in today’s automotive interior design. It can be challenging to use traditional thermoforming processes when trying to minimize grain stretch, maintain grain harmony between parts, and incorporate airbag logos and different grain areas on a single part.

During in-mold graining (IMG), the grain is first created on the foil during the deep drawing or vacuum laminating process. The ungrained and warmed foil is suctioned directly during the forming/laminating process into a contoured, grained shell. The grained surface of the shell is then imprinted on the warmed foil (TPO foam/compact sheet).

The IMG process combines the economic aspects of classic thermoforming technologies with the quality advantages of modern skin forming processes. It makes it possible to produce surfaces without visible grain stretch and manufacture parts with impressive grain quality.

Over the past few years, we’ve produced over

50 MACHINES

150 TOOLS

Why IMG? Your advantages:

- No visible grain stretch
- Various grain areas, technical surfaces, and patterns such as logos can be incorporated
- Decorative embossing (e.g., airbag logo, decorative stitching) can be produced during forming process without additional tooling components
- Shorter cycle times and fewer tools compared to pour and spray skins
- Processing of TPO foam/compact sheet
- Small undercuts possible
- Multiple applications and modifications possible for existing machines
- IMG shells made of various materials can be used:
  - Nickel
  - Steel
  - Epoxy (prototypes)
  - Aluminum (prototypes)
  - Ceramic (prototypes)
A VERSATILE MACHINE WITH AUTOMATIC TOOL CHANGE? THE COMBINED DEEP DRAWING AND VACUUM LAMINATING MACHINE FROM FRIMO.

Our “combi” machine is an IMG-capable in-line machine that combines deep drawing of foils for back foaming and vacuum laminating of substrates. Rolled materials can be processed with or without producing blanks. Switching between processes is made easy by a tool staging depot with a fully-automated tool change system. Both a pre-heating station for the tools and a substrate pre-heater are integrated. The loading and unloading station is optimized for ergonomic part handling.

Why the “combi” machine? Your advantages:

- Universal machine for multiple thermoforming technologies including IMG
- Material savings through process-optimizing chain rail system and blank production
- Fully-automated, quick tool change

PRODUCE PERFECT LARGE COMPONENTS TWO AT A TIME? THE FRIMO SHEETFED MACHINE MAKES IT POSSIBLE.

The SheetFed concept is especially well-suited for large parts that need to be produced two at a time. Instrument panels are a typical example. Cycle times of 55 - 95 seconds can be achieved.

The machine can deep draw and vacuum laminate, even with IMG. Foil blanks can be produced in the machine and optimally processed with the integrated gripper feeder. It is also possible to add a lengthwise and diagonal foil stretching capability.

Why SheetFed? Your advantages:

- Optimal foil positioning through gripper controls
- Material-saving concept
- Process-supporting compressed air forming
- Air support boxes for foil sag control
- Lower platen has pivot function for ergonomic unloading
- Largest possible tool formats can be used from 600 x 500 to 1,200 x 2,250 mm
- Can also be used for press laminating - clamp force 60 kN

FOUR TECHNOLOGIES IN ONE MACHINE? NOT A PROBLEM WITH THE FRIMO MULTIPURPOSE MACHINE (MPM).

Our multi-talented machine for vacuum laminating, edge folding, press laminating, and groove laminating is an ideal solution for flexible small series production. An IMG expansion can also be added. This concept is a particularly interesting option for medium-sized parts, such as armrests or pillar trims.

This single machine can smoothly switch between the four technologies. With just one upper platen, two tool uppers can be used cyclically. Switching between products and processes is made fast by the robotic tool change system.

Why the MPM? Your advantages:

- One investment for four technologies
- Short cycle times
- Fully-automated, quick tool change through robot
- Smooth technology change
- High process reliability

SAVE AS MUCH SPACE AS POSSIBLE AND STILL BE FAST? THE FRIMO COMPACT IN-LINE MACHINE IS THE SOLUTION FOR SMALL PRODUCTION SPACES.

If you have limited production space, yet need to produce high volumes, our compact in-line laminating machine is a great solution for smaller parts.

With substrate pre-heating and two upper platens for forming and punching, you won’t be giving anything up to save space.

Why the compact in-line machine? Your advantages:

- Customer and product-specific machine design
- Minimal space requirements at just 12 m²
- Cycle times of 60 seconds can be achieved
- Machine’s outer measurements allow container shipment
- Production-capable within just one day
- Energy-efficient heat emitter system TSHC
MULTIPLE TOOL SETS IN ONE MACHINE?
YOU ARE COMPLETELY FLEXIBLE WITH THE FRIMO FULLFLEX MACHINE.

It doesn’t get more flexible than this: cycle times of 40 – 60 seconds in the smallest area.

With the compact FullFlex concept, up to three complete tool sets can remain in the machine. That means 6 lower and 12 upper tools are always available. Tool changes are fully-automated, and tool pre-heating is integrated.

Why FullFlex? Your advantages:
- Flexible production with high operational availability
- No tool handling necessary
- Quick tool change (<5 minutes)
- Uses process-optimizing chain rail system
- Cost savings from lower material and energy use
- Optional lower platen with height adjustment
FAST, EFFICIENT HEATING?
WITH THE INNOVATIVE FRIMO TIME SHIFTED HEAT CONTROL.

- Foil temperature calculations take emitter layouts into account
- Automatic calculation of clamp frame geometry’s influence
- Automatic calibration cycle to identify foil’s thermal properties
- Absolute temperature values entered in the display
- Heating picture can be changed for each cycle

Why TSHC? Your advantages:
- Energy savings and reduced heating times
- Heat emitters run with optimal efficiency
- No heating period for emitters/no warm-up time/no waiting
- Easy maintenance (plug-in emitters)
- Floorspace savings
- Highest part quality upon start-up

WHAT CAN WE DO FOR YOU? WITH FRIMO THERMOFORMING TECHNOLOGY,
ALMOST ANYTHING IS POSSIBLE!

WANT TO PLAY IT SAFE BUT STILL SAVE MONEY? USE 3D THERMOFORMING SIMULATION TO CALCULATE FOR OPTIMAL PRODUCTION.

- Numerical calculation and optimization of stretch rate, foil thickness, material usage
- Simulation of various foil materials and part geometries
- Representation of various thermoforming materials including all tool functions
- Prototype manufacturing possible in TechCenter

Why use 3D simulation?
Your advantages:
- Foundation for series part production
- Access to data bank of numerous foil parameters
- First results presented within 2 weeks
- Possible reduction of series start-up times by up to 50 %

NUMEROUS APPLICATIONS IN MANY INDUSTRIES!
FRIMO. HIGH TECH AND HIGH PASSION.

FULL DEDICATION FOR YOUR SUCCESS.

LOCAL COMPETENCE WITH THE GLOBAL FRIMO NETWORK

Since FRIMO was founded in 1962, our corporate group has grown to become one of the leading technology suppliers for production solutions. Today, the FRIMO network consists of international locations in Europe, America, and Asia with a total of 1,500 employees and numerous international representatives.

Locations
- FRIMO Group
- FRIMO Lotte
- FRIMO Sontra
- FRIMO Freilassing
- FRIMO Hamburg
- FRIMO Control Systems
- FRIMO China
- FRIMO Hungary
- FRIMO USA
- FRIMO Mexico
- FRIMO Poland
- bo parts Germany
- bo parts USA
- B+R Elektro-Streuungstechnik

Representatives
- Brazil
- Czech Republic
- France
- Great Britain
- India
- Italy
- Korea
- Portugal
- Russia
- Scandinavia
- Slovakia
- Spain
- Turkey

ONE STOP. ALL SERVICES.
An unparalleled range of technologies

We provide technology-neutral advice:
- PU PROCESSING
- FLEXIBLE TRIMMING
- PUNCHING
- PRESSING/FORMING
- THERMOFORMING
- PRESS LAMINATING
- EDGE FOLDING
- JOINING/GLUING

We support in every step of the process:
- ENGINEERING
- PROJECT MANAGEMENT
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