TOOLS FACTORY

TOOLS FACTORY

MACHINERY FOR THE PLASTICS INDUSTRY

www.toolsfactory.pl

INTRODUCING THE COMPANY

TOOLS FACTORY Sp. J. is the Polish, family owned company specialized in designing and manufacturing the machines for plastic processing. We have over 25 years of experience on the market and become one of the leaders in Europe. Our machines are delivered to satisfied customers in many countries: Germany, Spain, Italy, Czech Republic, Croatia, Romania, Sweden, Switzerland, Bulgaria, Hungary, Kazakhstan, Lithuania, Latvia and others.

Vacuum **thermoforming machines** are our primary products, and the full range of our products includes:

- **Vacuum thermoforming machines in 5 series:**
  SMARTLINE, QUICKLINE, ENERGYLINE, SPALINE and TWINLINE
- Machines for **rotation moulding**
- 3-axis and 4-axis **CNC milling machines**
- 5-axis **CNC machining centres**
- Horizontal **band saws**
- **Heating stoves**
- Other machines

Our MOTTO is:

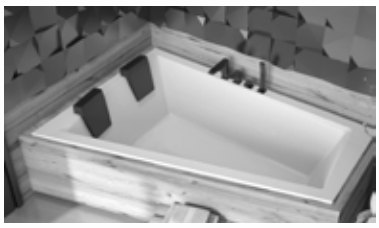
We deliver customized, modern and proved solutions

CEO
Mr. **Robert Popławski**

President
Ms. **Agnieszka Popławska**

Founders and owners of the company TOOLS FACTORY Sp. J.

sanitary




automotive – vehicles

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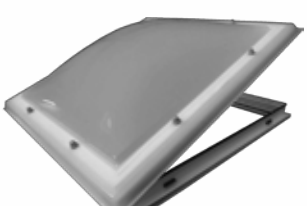


APPLICATIONS

SMARTLINE

thermoforming machines **SMARTLINE** series

SMARTLINE thermoforming and **vacuum forming machines** are basic, single station units with many advantages. Designed for high productivity, reliability and durability, produced with excellent quality and supplied with innovative devices and solutions, which helps to control precisely the process:

- **Automatic diagnostics**.
- Built-in **EWON module** with VPN protocol enabling online access and service.
- **Motion Controller driver** using ultrafast EtherCat network for real-time control of all devices.
- Automatic size adjustment of working area.
- Automatic dimensions adjustment of forming window and universal clamping frame.
- **Modern** quartz **heating elements** or ceramic.
- Precise power regulation of each heating element or group of them.
- **Automatic control** of heating and cooling process
- Thermoregulation of bottom frame (option)
- Heating of universal clamping frame (option)
- Automatic Feeding System (AFS) for sheet or roll material (option)

thermoforming machine **QUICKLINE** series

QUICKLINE

QUICKLINE machines are up-graded units with innovative design and solutions, which makes them fast, energy saving and more sustainable.

They are supplied with:

- **Halogen lamps** of latest generation, saving up to 30% of energy and decreasing heating time up to 40% (process acceleration)
- **Electric servo drives** for all moving elements allow to accelerate the process and precisely program and control all movements
- **Central cooling system** with central ventilation unit
- **Automatic diagnostic system** for all machine components and all heating elements
- **Automatic Feeding System (AFS)** usually combined with machine to supply raw material (sheets or roll)

ENERGYLINE

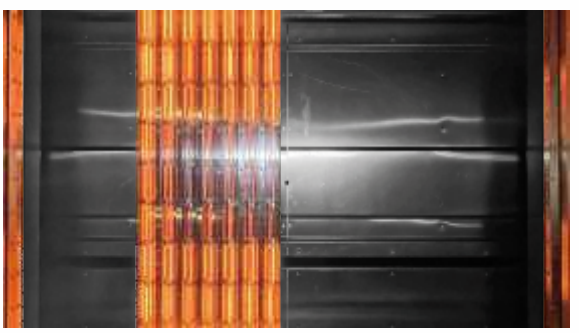
thermoforming machine **ENERGYLINE** series

ENERGYLINE machines are the best solution for those who value measurable savings. They are designed to save energy needed for production and resources needed to construct machines. Their most important distinguishing feature are specially constructed heaters equipped with a movable, wandering panels with halogen emitters (lamps). The panels in the lower heater and the upper heater move in counter-rotation, which allows for even temperature distribution during the forming process. The speed and range of movement, as well as the heater power assigned to the position, are controlled in the control program. This "dynamic" method of heating the material ensures better heat distribution, more uniform energy distribution, no overheating of the surface and, as a result, large heating energy savings of 40 – 50%. An additional benefit is the very low power installed and required in ENERGYLINE machines – from 22 to 60 kW.

ENERGYLINE machines are equipped with the following solutions, unique and specific to this group:

- **Wandering heating panels** in the upper and lower heaters, equipped with halogen heating lamps.
- A special **steering program** controlling the power of the heaters, the range and speed of panel movement.
- The mould table driven by **servo drives**
- **Pneumatically locked** and opened machine door
- Electricity consumption **meter and analyser**
- **Automatic diagnostics** of the most important machine components before startup and during operation
- Possibility to connect **an IP camera**

INNOVATIVE ENERGY – SAVING PATENTED HEATING SYSTEM



NEW DYNAMIC HEATING SOLUTION WANDERING HEATING PANELS

thermoforming machine **SPALINE** series

SPALINE is the family of machines specially designed and produced for deep forming of hot tubs or baths mouldings. As other machines from TOOLS FACTORY they are supplied with modern and unique solutions:

- Specific adjustable **clamping frame** with grippers for material.
- Electric **servo drives**.
- Quartz **heating lamps**, with power regulation and program controlled.
- Special **electro-driven, sliding table** for sheet loading, moulding take-off or mould exchange
- **Laser control system** of material sag
- Fully automatic mode of process or hand controlled

TWINLINE

thermoforming machine **TWINLINE** series

TWINLINE series machines are designed to work in the "Twin-Sheet" technology. They contain a number of unique solutions that allow for the simultaneous heating and forming of two sheets of plastic material and the final combining them into one product. The combination of precise heating of the plastic sheets and appropriate pressure allows the connection of vacuum formed pieces in one process, without using any adhesives nor solvents. This enables the efficient production of spatial, hollow elements with shapes impossible to obtain on a typical thermoforming machine.
The same types of thermoplastic materials as in the normal process can be used for production.
The boards to be connected can have different thickness and colour. Production can be manual or automatic with a material feeder.

TWINLINE machines are supplied with the following specific solutions:
- possibility of mounting **two moulds** (upper and lower)
- possibility of **simultaneous heating** of two sheets on different levels
- halogen or quartz heating elements
- **regulation and precise control** of the heating process
- a special, **double clamping frame** with electric servo drives
- automatic sheet feeder
- automatic collection of products

TWINLINE machines can also be used as conventional thermoforming machines, working with one mould and one sheet of plastic material.

ASFS
– Automatic Sheet Feeding System

Thermoforming machine with sheet loader and receiver.

ASFS is a station for automatic loading of raw material and unloading of finished products. It can be easily combined with thermoforming machine and controlled by its program and panel. The main features of ASFS are:

- **Modular design** with complete safety protection and door in the front.
- Table for loading at the same time one or two pallets with sheets of plastic.
- Two-steps **automatic process of positioning** of pallet and sheets.
- **Four servo motors** for precise lifting up the table with sheets to the level required by suction cups of the loading frame
- Pneumatic sheet separator to secure loading of thin sheets from the stack.
- Adjustable sensor of sheet thickness
- Ionizing device to neutralize electrostatic charges
- Loading frame with suction cups to lift a sheet and deliver it into working area, and to remove finished elements from machine into unloading zone.
- Automated pusher for shifting finished elements off the loading frame. Shift direction – on request of customer.
- Special grippers attached to the clamping frame, which are used to capture, lift up and drop finished elements on the loading frame.

Thermoforming machines can be supplied with devices and functions enabling to produce skylights without using moulds, such as:

- **Ultrasonic sensor** for precise control of dome height during blowing.
- **Proportional valve or side-channel blower** for perfect control of dome blowing.
- Special design **clamping frame:** electric heated bars of frame, one or two working windows for single or double thermoforming
- **Special design working window:** window plates with thermoregulation, one or two working windows for single or double thermoforming
- Fans divided into sections with **ability to program** blowing parameters (flow, speed, time)
- **Special design ASFS:** loading and positioning on the table one or two pallets at the same time, precise automatic loading of one or two sheets simultaneously for single or double thermoforming.

ARFS
– Automatic Roll Feeding System

Thermoforming machine with roll feeder.

SMARTLINE or QUICKLINE thermoforming machines can be supplied with **automatic roll feeding system (ARFS)** and combined into one working station performing automatic loading of material from the roll, cutting off the material to required size and unloading finished products. The process is **fully automated** and simply controlled from one panel. This solution is used to obtain the highest efficiency of production process.

The advantages of thermoforming with ARFS are as follows:

- **High efficiency** of production
- **Easy loading** of material rolls
- Cutting off the material with **pneumatic knife**
- **Knifes with double blades** for trimming formed elements
- Function of the **finished products unloading**
- **Control of material traction** (leading, stretching)
- **Safety protection system** (optical sensors)
- Function of **lamination**
- **Easy exchange** of moulds
- **Easy adjustment** of the working area

Halogen lamps

— the fastest and most effective heating elements

All QUICKLINE thermoforming machines are supplied with the latest generation halogen radiators, installed in the both heaters (top and bottom).
The modern and sophisticated technology makes infrared halogen lamps the most efficient, reliable and safe source of heat.

Their advantages are:

- **Fast reaction**. 90% of the heat is available within one second (no pre-heating)
- Heat can be directed using reflectors. It means, that even small partial areas can be heated also effectively.
- Heat intensity is continuously variable from 0 to 100%.
- More than 90% of energy used is converted into IR radiation
- 5 000 hours lifetime — **reduced maintenance cost**
- **No harmful emission**, no oxygen consumption, no pollution of air, less stench
- **Special shock resistant** quartz tubes ensure high efficiency during whole lifetime
- **Save up to 30%** of energy and up to 40% of heating time (comparing to ceramic)

Types of heating elements

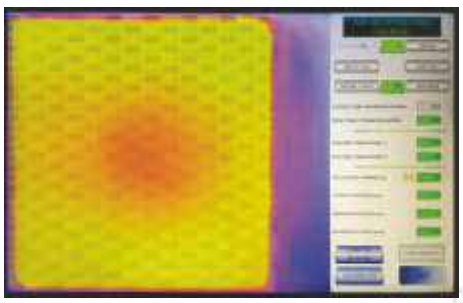
QUARTZ HEATERS

HALOGEN LAMPS

Vacuum thermoforming machines produced by TOOLS FACTORY can use different types of infrared heating elements: quartz or halogen. Each of the type has own, strong features and advantages. For example, standard quartz heaters are economic and durable, whereas innovative halogen lamps are fast and efficient, which allows to reduce significantly the cycle time and reduce energy consumption.

Real time thermal analysis — RTTA

The modern thermal imaging cameras allow to view the actual temperature distribution live. The captured temperature image gives you the possibility to evaluate heating conditions and make necessary corrections automatically.



OUR STRENGTHS

Central **cooling system**

Central cooling system is intended for faster and more effective cooling of formed products. It consists of central ventilation unit, filters, air ducts and nozzles. Air inlet is placed at floor level, using much cooler air then the one above the machine. System is supplied with devices measuring and indicating the purity of filters.

The advantages of central cooling system are:

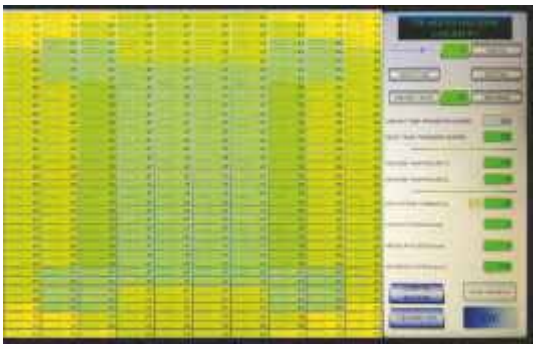
- More effective cooling due to cooler air and bigger power of ventilation unit
- Reduction of cooling time and whole working cycle
- Higher efficiency of the machine
- Less noise then standard fans
- Higher precision and adjustability due to directional nozzles with automatic adjustment

Electric motors and servo drives
for all moving parts of the machine

Electric motors and servo drives allow to get dynamic movement with fast and precise positioning. This increases work efficiency and allows to achieve higher performance of the machine.
All moving parts of the machine, like clamping frame, heaters and table, can be upgraded from pneumatic drives to servo drives.

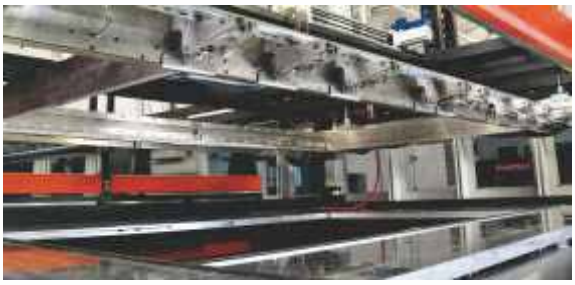
Precise **regulation** of each **heating element**

The machine offers the precise power regulation of each heating element of top and bottom heaters by LCD touch panel. You can set the power percentage of each radiator to obtain homogenous or different required temperature distribution, or you can influence the heating speed. You can adjust precisely the heating process to the kind of plastic material. All values can be programmed and stored in the controller memory while saving programs.



Adjustable **clamping frame**

Universal clamping frame made of **stainless steel** with automatic adjustment of the size. The operator can move the bars and change the working area within few seconds using program controlling electric motors and servo drives. All parameters of movements and positions on X and Y axis can be stored in the controller memory.



System of **quick change** of moulds and reducing frames

The system is built on the basis of additional aluminium moving table, special supports for the table outside of the machine and pneumatic locks. It allows for quick and comfortable replacement of reducing frame and/or mould outside the machine in few steps.

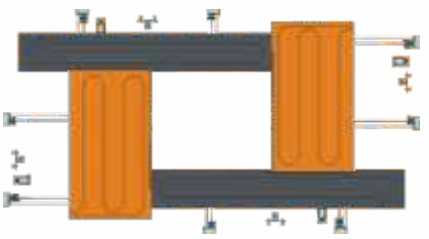
OUR STRENGTHS

Adjustable **Window Frame**

Adjustable window frame system consists of four movable, aluminium plates with temperature control. Stepless motorized window size adjustment is possible in both axis by touch panel.
The adjustment is carried out by 4 electric motors and 4 servo drives. This solution is particularly useful for wide production range with frequent need to change moulds of different sizes.

The advantages are:

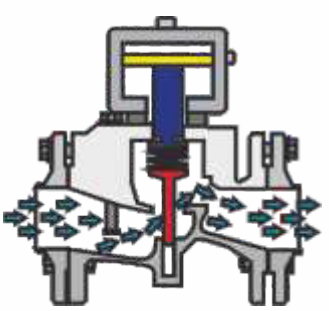
- Cost reduction (less reduction frames)
- Reduction of time for replacement
- Working environment improvement
- Safety improvement, no hand operations



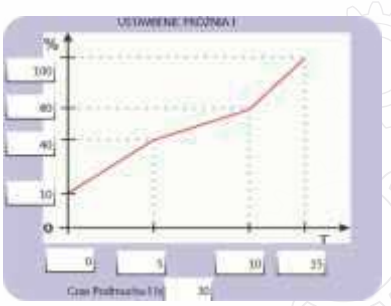
Plug assist

Plug assist is **used in the thermoforming process** if necessary **to stretch** the plasticised material mechanically by means of stamp (negative mould). The device is a rigid steel structure. The vertical movement of plug assist is carried out by electric motor and servo drive.

Industrial infrared pyrometers



Proportional valves



Rotomoulding machines

The **ROTOMOULDING** machines are designed for production of spatial and hollow elements, usually big size, like tanks, containers, boats, kayaks, etc. The products are formed by heating and melting the plastic combined with the simultaneous rotation of the moulds around two perpendicular axes.

We offer two types (series) of machines:
1. **SHUTTLE** - basic series of machines with a central furnace and two independent forming stations located in one line. This type of machinery ensures efficiency and the ability to produce two different products at the same time. It is especially suitable for the production of large-size products.
2. **CAROUSEL** - is a series of machines with a central vertical axis and several workstations (charging, heating, cooling, etc.), to which the moulds move successively. This type of machines ensures the highest efficiency and the possibility of producing many products at the same time.

Both types of machines can be supplied with different types of working (clamping) arms: straight, L-shaped and U-shaped.

Advantages of our machines:

- short time of heating the chamber
- the possibility of extending the machine
- customized solutions
- remote on-line service
- commissioning and on-site training
- LCD touch panel to operate the machine
- Components from renewed companies (OMRON, WEISHAUPT...)

5-axis
CNC machining centres

SMARTCUT series 5-axis CNC milling machines have 5 interpolated axes. These machines are designed for processing of elements made of wood, wood-based materials (chipboard, MDF, plywood, etc.), plastics, composite materials based on plastics and aluminium.
SMARTCUT machines use numerical controllers – the most advanced control system, working perfectly in the best machines all over the world. It offers the fastest digital communication between motion controller and machine axes and guarantees high dynamics and precision of the process.

Probes

Tool probe allows to measure and correct automatically the length and diameter of the cutter. It offers damage control, as well. The probe is mounted in a safe, covered position, which ensures the repeatability of the measurement..

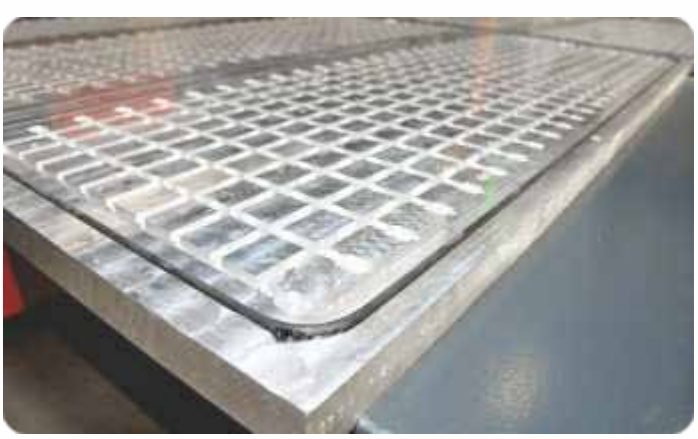
Shape probe is used to measure dimensions and position of the workpiece mounted on the table. It is used often in reverse engineering process.

Rotary interpolated axes

Transmission of servo motors motion to rotary interpolated axes is accomplished by special, cycloidal rotary gears. This ensures very high positioning precision and reliability of the rotary axes in the machine.

Working table

Working table: milled aluminium plate with parallel grooves (inverted T section), or a grid of perpendicular grooves for the use of vacuum clamping system, or a surface with hybrid structure. Option: two shuttle tables, driven by electric motors and servo drives.



Tool changer

Automatic linear tool changer with a capacity of 8 – 15 tools. Optional revolver magazine for 16 – 24 tools.

Controlling system

Controlling system of machine with a friendly touch screen panel or hand control unit.

3 and 4-axis

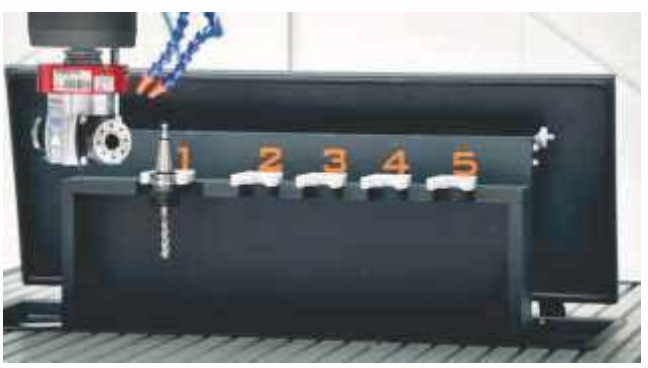
CNC milling machines

MASTERCUT

MASTERCUT series 3 and 4-axis milling machines are designed for processing various materials, such as plastics, wood and wood-based materials or non-ferrous metals. These machines are widely used in production of 3D moulds and processing of thermoformed elements. They can be delivered with various working table sizes, various Z axis clearances and with many additional options.

Angular aggregate

Angular aggregate with active C axis (additional 4th axis) installed on the basic milling spindle enables standard milling machine to be transformed into a multifunction CNC milling machine. Angular aggregates allow to cut material with vertical saws, mill the holes and drill the holes in planes perpendicular to the table.



Horizontal **band saws**

The **horizontal bend saw** is used to trim the edges of a thermoformed product. The machine is equipped with special wheels to clamp the moulding to moving belt and secure even cutting. You can adjust the speed of belt traction, cutting height and rotation speed of the saw blade.

Heating stoves for sheets

The device used for heating and plasticization of the sheets in production of sanitary products.

TOOLS FACTORY

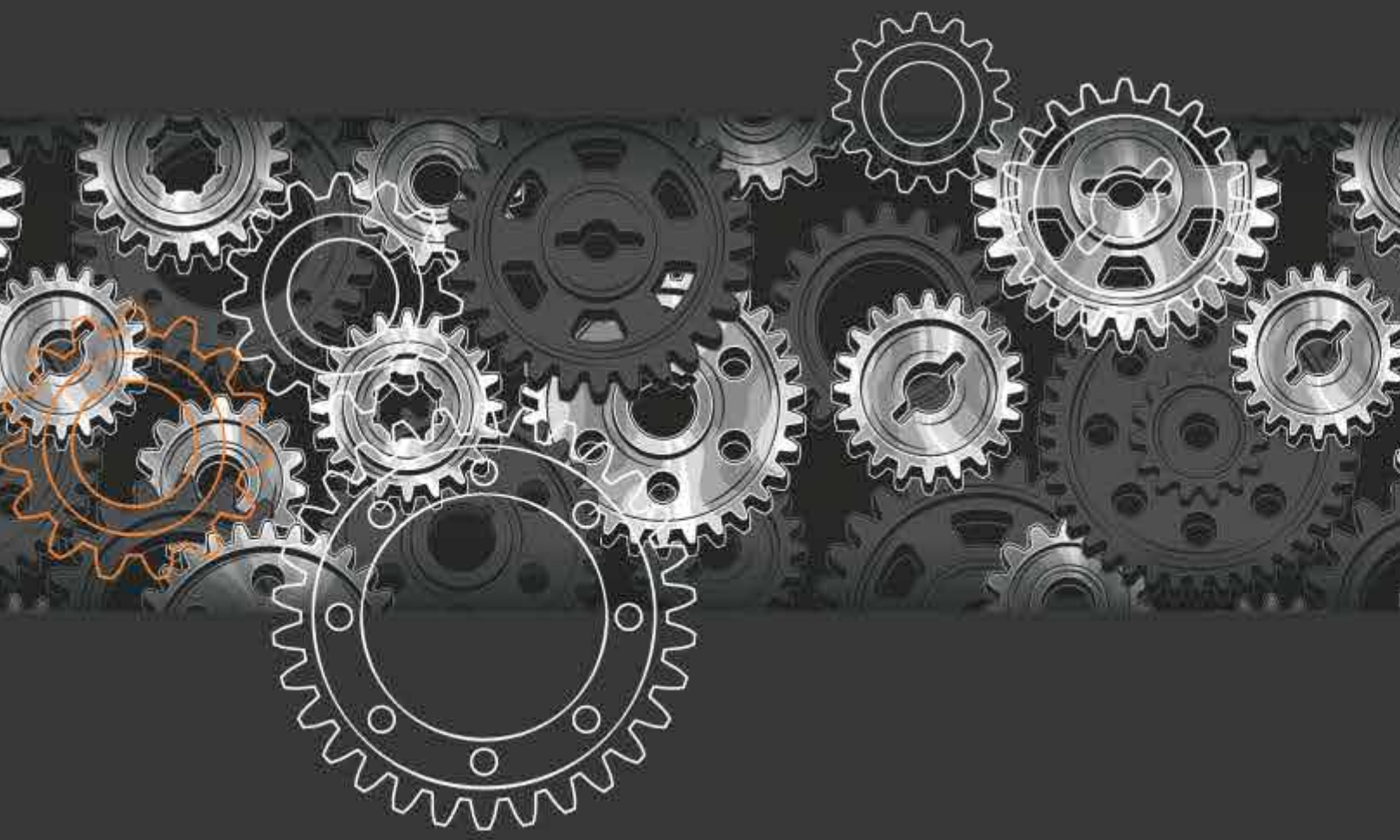
MACHINERY FOR THE PLASTICS INDUSTRY

news

ENERGYLINE Machines

Thermoforming machines with a dynamic heating process of plastic, guaranteeing maximum savings in electricity consumption.

SAVE YOUR ENERGY AND COSTS!
ASK FOR DETAILS!



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