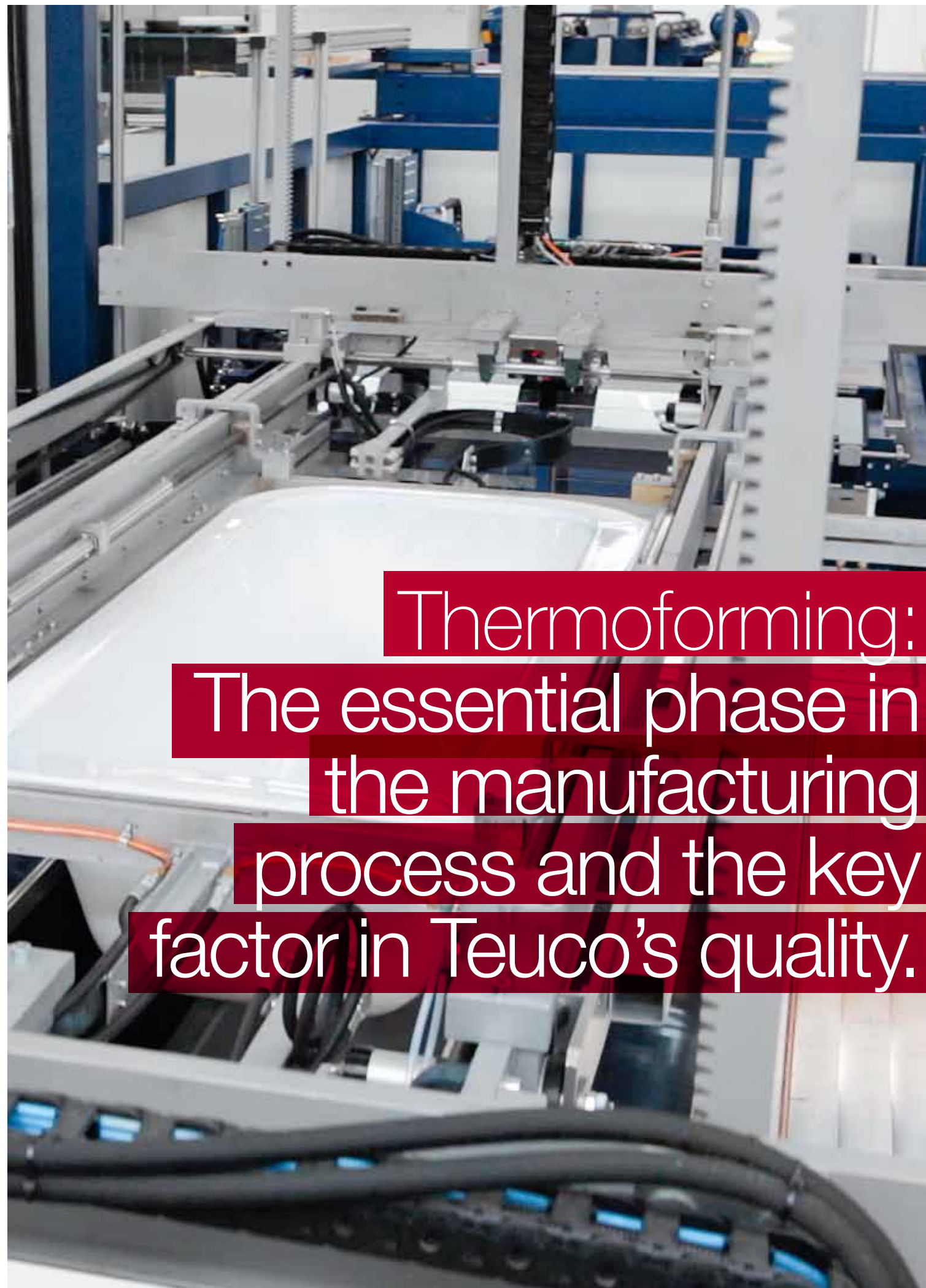


BR5S: the sheet thermoforming machine with fully automatic loading/unloading system

Case History Teuco





Thermoforming:
The essential phase in
the manufacturing
process and the key
factor in Teuco's quality.

Following the technological evolution of thermoforming machines, Teuco aims at improving energy efficiency, reducing consumptions and acquiring the ability of tuning to contemporary design trends.

Teuco bathtubs and showers have become benchmarks for the aesthetical culture of interior design, where bathroom environments have steadily grown in importance.



teuco

Teuco-Guzzini Industrial Group has been active since 1972 successfully and has never relocated its manufacturing sites from the area of Montelupone-Recanati, in the province of Macerata, to a different place. Here is where Virgilio Guzzini revolutionized the concept of bathroom environments by manufacturing acrylic tubs, an absolutely innovative material for the sector and instrumental for bringing the company to the leadership in the field of whirlpool baths. Thanks to its policy of constant investments, Teuco continues to lead in the development and evolution of bathroom environments, by transforming them into open spaces to be lived and exhibited unreservedly. Owing to the unique features of Teuco production, characterised by the use of thermoplastic materials for the manufacture of tubs and showers, as ideally suitable for meeting any requirements of design projects flexibly and competitively, thermoforming machines are of great importance in the company's production cycle. So far traditional vacuum thermoforming techniques have been employed in Teuco's factories, based on the use of diathermal oil, where it is necessary to bring oil to the right temperature and maintain it in operating conditions, therefore wasting

energy beyond any actual production needs. From a mechanical viewpoint Teuco also felt the urgency of using innovative machinery, in order to comply with the contemporary design requirements, above all in connection with the thermoforming results obtained with bathtub and shower tray edges, but also with the aim at optimizing production times by speeding up loading and unloading rates.





BR5S: An innovatory system for automatic thermoforming.



The BR/5 series - sheet thermoforming machine equipped with a manual or automatic loading system - is a reference point for the market and benefits from over 30 years' technical development. Utmost attention has been given to mould changing readiness, in order to curb production change times into few minutes. Another sought for and attained target is programming and diagnostic user-friendliness: this machine can even be operated by unskilled workers. Brushless motors governed by digitally controlled motion dynamics drive the machine.

Formed workpiece support and automatic unloading

Formed workpieces are ejected from the front loader carriage through a motorized vertical unloading system. For negative workpieces a special width-adjustable support is provided.

Quick machine setup change

The dimensions of the clamping frame and the reduction plate are entrusted to the full digital control of servomotor electric motion for quick and accurate machine setup change.

Sheet centering

The loading station is equipped with single sheet aligning and centering devices in order to ensure correct positioning in the thermoforming area.

Quick mould change

An extractable mould carrier plate and an automatic plate coupling system enable tooling the machine for a new production cycle quickly, safely and handily.

An integrated control system that speeds up production times and trims costs.

BR5S press moulding technology avails itself of a special software developed by CMS Plastic Technology directly, an extremely rational, versatile and user-friendly application for the machine operator indeed.

This software package enables setting the machining parameters, monitors the machine working and the process operating phases in real time, generates a "history file" where all operations are stored and, according to any specific and contingent needs, sets up a dialogue with the on-line computing devices and networks within the production sites and product engineering departments. This Windows -

only 1 operator is necessary for full process control.

based software supervises the BR5S technology and is the result of CMS Plastic Technology's long-term experience in the vacuum thermoforming field. It is characterized by a rational and user-oriented interface, directly

visible from the machine control panel, where it generates a display diagram showing all useful operator parameters for full manufacturing cycle control.

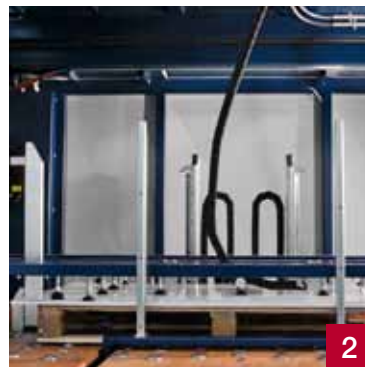
The sheet vacuum thermoforming process ensures excellent aesthetical performance without complementary machining being necessary. Via the control panel it is possible to vary the work-piece intervention modes, among which temperature, air/vacuum flows and axis speed.

A BR5S machine by CMS Plastic Technology enables obtaining different types of peculiar and customized technical products. The sheets can be made of various materials, among which PC/Polycarbonate, ABS, PE/Polyethylene, PP/Polypropylene, etc.





Mould loading
The adoption of special expedients makes mould loading or replacing operations so easy that they can be carried out by just one operator.



Sheet pick-up
The automatic suction cup system picks up a sheet from the pallet, which can be easily positioned in the special magazine.



Sheet loading
After being centered in both directions, the sheet is loaded by means of special suction cups on the positioning carriage.



Sheet clamping
The sheet is positioned on the automatic reduction plate and then blocked by the automatic clamping frame.



Heating
The correct operating temperature is achieved very quickly owing to halogen technology.



Thermoforming
The transformation of the material is fully governed by the system.



Cooling
The thermoformed workpiece is submitted to an air flow generated by fans that are fully automated and machine-controlled.



Product unloading
The workpiece unloading is always operated in full automatic mode by means of a carriage system that moves according to scheduled dynamics.



New sheet loading
While the thermoformed workpiece is being unloaded, the cycle has already restarted in order to make the most of operating time.



The production process:
efficiency, safety and
performance quality.



Teuco products, appreciated all over the world for their first-rate design and stylistic research, are strictly manufactured in Italy at the Montelupone (Macerata) production sites, where they are also tested and IMQ and ISO 9001 certified, according to their top technological and manufacturing quality. Teuco's designing skills are substantiated by 60 international patents. Nowadays Teuco has become a universally renowned brand for bathroom fittings and boasts complete and multipurpose design collections made up of washbasins, sanitary fixtures, taps and fittings, bathtubs and shower cubicles, cabins, combi units, steam rooms and mini swimming pools. Besides, Teuco has always represented the state of the art in the use of plastic materials by gearing them to design requirements. Thanks to Teuco, whirlpool baths have now become an aesthetical choice without neglecting massage efficacy. The manifold international awards point out the project skills that have guided Teuco in the development of bathroom environments for over 40 years, owing to a cultural attitude, rather than entrepreneurial, that turns technology to the complete service of wellbeing. The adoption of the innovative vacuum thermoforming BR5S machine by CMS Plastic Technology falls within their constant and deep rooted care for manufacturing and design quality: their market interlocutors are offered the most suitable creative opportunities, in a rational and competitive way.

BR5 for Teuco: high added value evolution

High performance

The fruits of
prototyping
dialogue with
the Customer



CMS tests

The pictures on display in these pages show some technical testing phases regarding the BR5S machine, as set up according to Teuco-specific parameters, before hauling the machine to Montelupone (Macerata) factories and installing it.

Eng. Giuseppe Villa, technical director of CMS Plastic Technology, assists Teuco's staff in testing the machine potential by checking its thermoforming performance on purpose-selected "test pieces" with respect to their form complexity and specific aesthetical-functional typology.





Trust
Responsibility
Esteem

Advantages

Reduction in energy consumption

BR5S technology has enabled Teuco to give up using machines based on diathermal oil pre-heating and heating, thus saving about 50% on the energy bill.

Reduction in processing times

The simultaneous loading and unloading system which distinguishes a BR5S machine enables Teuco to curb the working hours that are necessary for the production of one single workpiece by about 30%.

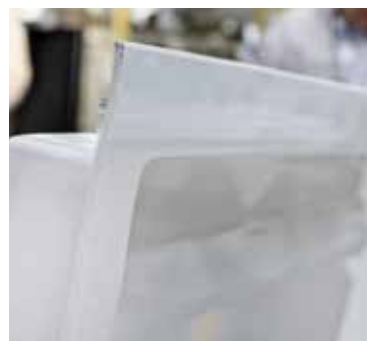
Design forms

The special techno-applicative expedients worked out by CMS engineering department enable the machining of sharp-edged workpieces, as it is typical of contemporary design trends.

Higher product reliability

The thermoformed material appears homogeneous in quantity and thickness of all the workpiece parts, thus offering a solid guarantee against cracks and splitting.

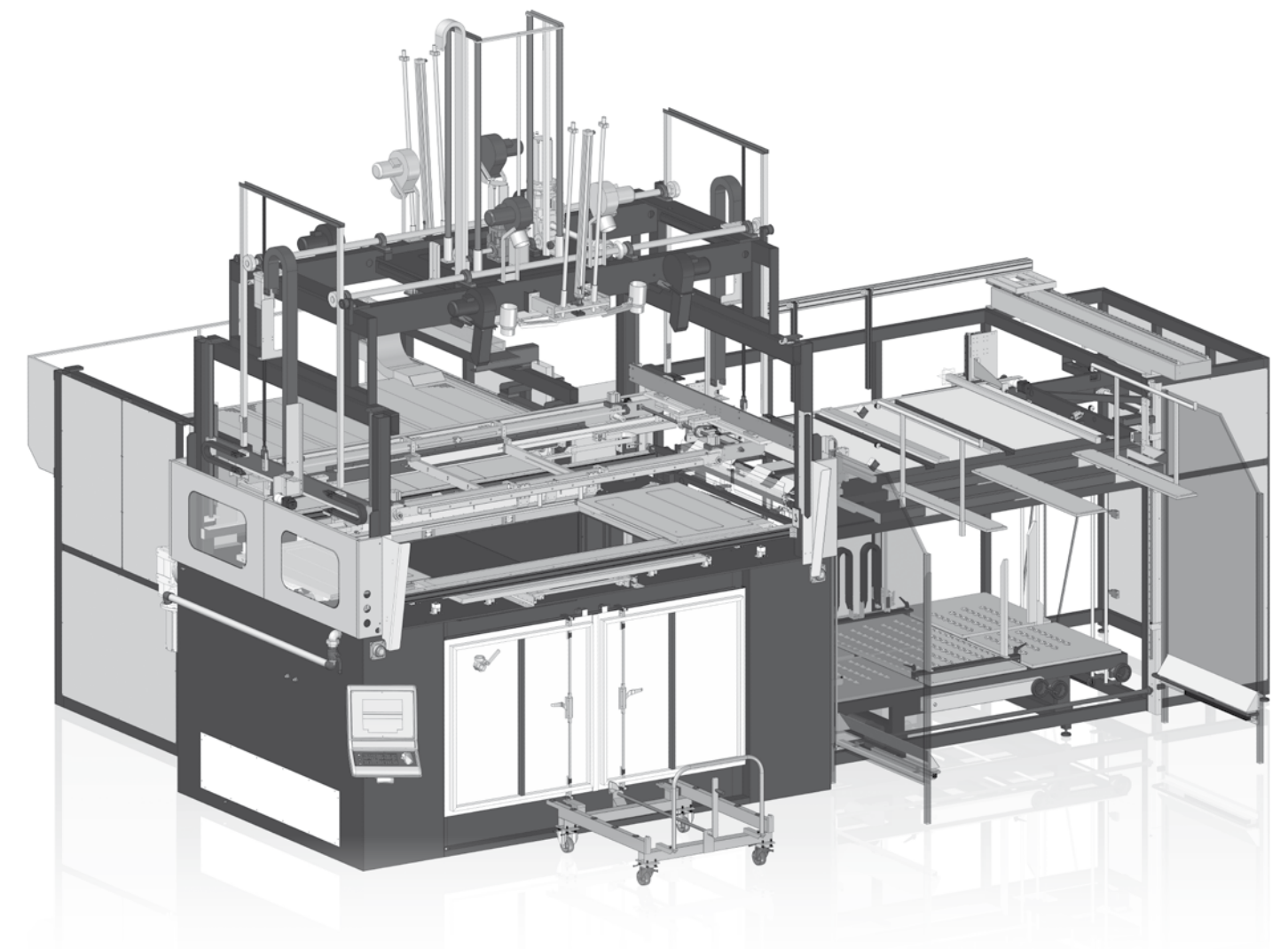
The trials and tests carried out at CMS Plastic Technology plants in Levate (Bergamo) have fully confirmed the validity of the principles that inspired the project that was especially worked out for Teuco: obtaining higher quality parts, perfectly formed even in those areas that are “critical” for this system type, working faster and curbing energy consumption. Owing to this BR5S machine Teuco production lines can rely on a cutting-edge technology that changes the thermoforming cycle radically, fully meeting all energy saving needs, both as regards constant tuning to the market positioning, based on the offer of advanced-design and trendy products, and in an attempt to forestall the stylistic canons of bathroom fittings. Thanks to BR5S process automation, Teuco plants are now witnessing a remarkable increase in production rates and a substantial reduction in costs, above all as regards energy bills and the total working hours of thermoforming operators. After adopting its first BR5S machine, Teuco’s management intends to renovate the thermoforming lines completely by installing CMS Plastic Technology’s latest generation machinery.





Technical data

Description	Measuring unit	Value
Overall dimensions: width-depth-height	mm	9500 x 6500 x 6300
Size of clamping frame	mm	2.250 x 1.200
Thrust of clamping frame	DaN	2500
Maximum sheet size	mm	2.300 x 1.250
Minimum size of automatic reduction plate	mm	850 X 400
Maximum mould height	mm	1200
Thrust of mould plate	DaN	6000
Thrust of plug assist	DaN	1500
Quartz elements upper heater power	KW	75,6
Quartz elements lower heater power	KW	49,5
Vacuum pump capacity	mc/h	2 X 165
Formed workpiece cooling fan power	KW	8 x 0.37
Total installed power	KW	150





www.cmsindustries.it

CMS SpA has been active as an engineering company since 1969. It is now operating in various industrial automation fields (CNC multi-axis machining centres, thermoformers, water jet cutting systems, etc) under the brand of CMS Industries that includes all the Company divisions and is backed by a sales and customer service network that spreads all over the world. The wide range of products combined with the well-deserved renown for quality and accuracy enables CMS SpA to offer flexible, innovative and effective solutions for meeting the various production process phases and the customers' specific needs. Since 2002 CMS SpA has been part of SCM GROUP, global leader in the production of woodworking machining centres, with over 3500 employees, an annual turnover of 650 million Euro and a worldwide presence in 120 countries of all continents.

CMS Plastic Technology is a brand belonging to CMS SpA, an engineering company specialized in the construction of special machinery, machining centres and integrated systems for the most diversified industrial sectors. On the strength of its know-how and constant commitment to research, CMS Plastic Technology offers its services as a privileged partner for the whole process: from thermoforming to trimming, from models to moulds. CMS Plastic Technology's broad range of machinery and machining centres enables optimizing the process phases, curbing operating times and boosting productivity. The essential element of their performance advantage is that each machine is tailored to each customer's specific needs.

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