



The Combi,

**Improving hygiene and cutting costs
to package your product**



THE COMBI CONCEPT, WHICH INTEGRATES THREE ESSENTIAL PACKAGING FUNCTIONS - BOTTLE BLOW MOLDING, FILLING AND CAPPING - IS A SIDEL INNOVATION. SUITABLE FOR ALL LIQUIDS PACKAGED IN PET, THE COMBI IS THE IDEAL WAY TO ADD VALUE TO COMPLETE PACKAGING LINES.

Ushering in a technological revolution

Since launching the Combi in 1997, Sidel has been an innovative pioneer in the field of integrated systems for packaging liquid products in plastic bottles. This integrated blow molding, filling, capping solution eliminates conveying, empty bottle handling, accumulation and storage, which reduces the number of machines and improves production reliability.

After its initial success for still water applications in 1998, the Combi quickly began making its mark in other sectors including CSDs, sensitive products, food products and detergents. Today the Combi can be found in all corners of the world and offers a competitive alternative to traditional packaging lines, regardless of a manufacturer's annual production volume.



FULL ARSENAL OF SIDEL SAVOIR-FAIRE AT YOUR SERVICE

The Sidel Combi has literally changed the rules of packaging. The equipment's unrivaled technological superiority guarantees first-class performance of your production line. The equipment features the latest Sidel Group advances in blow molding and filling, and

Combi machines are configured to suit your particular packaging requirements based on your product's specific needs. The integrated Combi raises the bar on hygiene while simultaneously cutting costs: a recipe for success.



The answer to your product's specific needs

	Your product	Special requirements and/or challenges
Still drinks	Still water	Food safety, bottle design, use of sport caps, line flexibility
	Flavored still water	Preserving taste, bacteriological stability
Carbonated beverages	Sparkling water	Food safety, concentration of CO ₂ , CO ₂ barrier, easy open
	Soft drinks	Foam, filling temperature, CO ₂ barrier, limited oxidation, filling precision, variety of bottles
	Beer, cider	Limited oxygen absorption by product, guaranteed volume
Juice, tea, isotonic drinks	Drinks with preservatives	Food safety, line flexibility allowing for package diversity
	Fresh juice	Product with pulp, guaranteed volume, bacteriological stability, O ₂ barrier, vitamin protection, color preservation
	Tea	Foam, bacteriological stability, preserving taste and aroma, flexibility
	Isotonic and energy drinks	Foam, guaranteed volume, food safety, bottle shape, use of sport caps
Milk and dairy products	Pasteurized/ESL milk	Easy open, expiration date, food safety, taste protection
	UHT milk	Easy open, aseptic guarantee, light barrier, capping safety, taste protection
	Drinkable yogurt	Food safety (hygiene), fruit or food particles or inclusions, bottle shape
Other products	Edible oils and dressings	Filling temperature, sensitivity to oxygen, variation in density, filling accuracy
	Sauces, soups, jams and jellies	Variety of containers and caps, thick products, inclusions, filling accuracy
	Detergents	Foam, filling accuracy, variety of containers and caps



YOUR PRODUCT IS UNIQUE

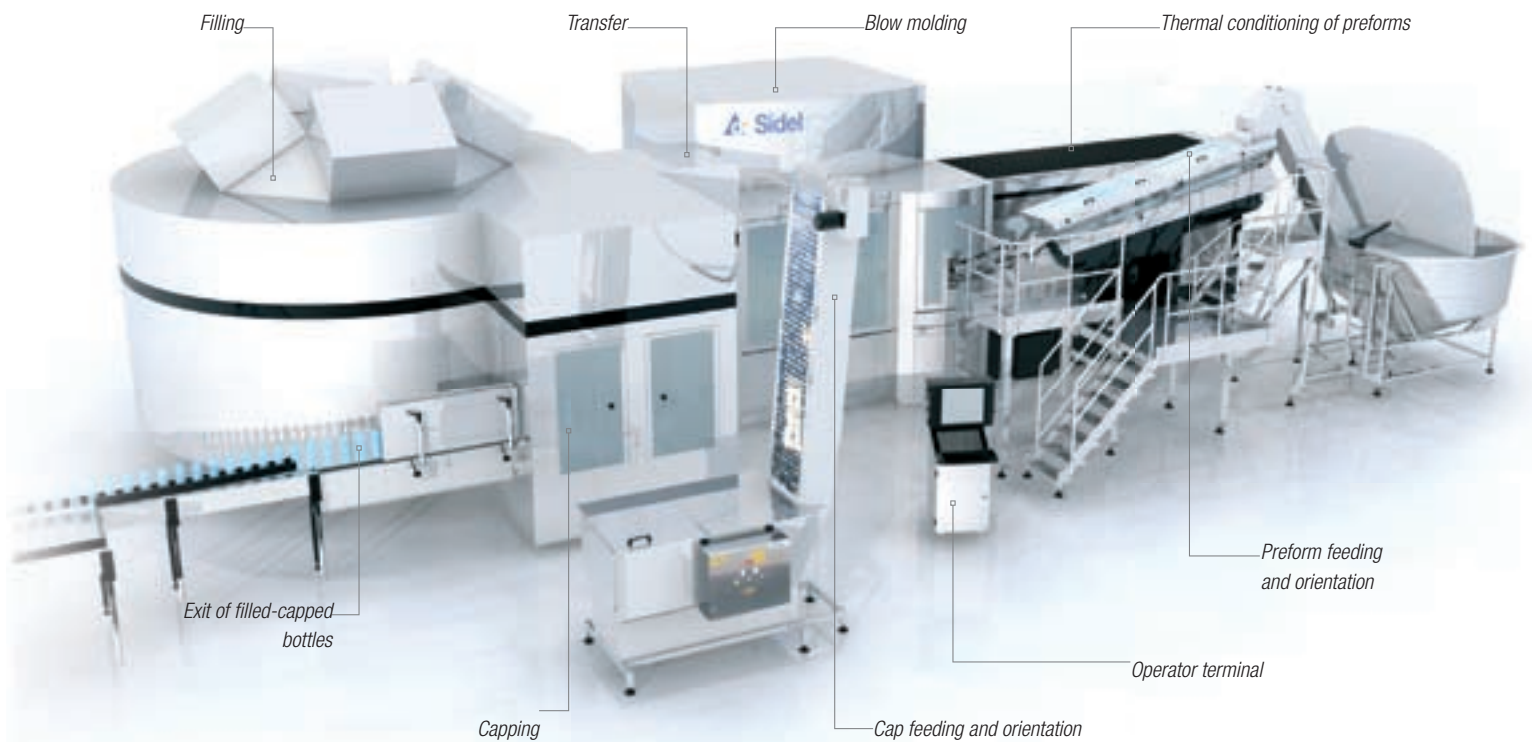
Whether it's still or sparkling water, soft drinks or sensitive drinks, sauces or detergents, the Sidel Combi can easily adapt to a broad range of product applications and the specifications of your particular packaging line.

HYGIENE AND COST REDUCTION

The Combi is the marriage of blow molding and filling synergies developed at Sidel. The equipment also benefits from the Group's constant technological innovations. The Sidel Combi has a single enclosure and requires no intermediate equipment for greater package hygiene that is better targeted to your product's needs. The Combi's overall efficiency,

its compact size, ergonomic design, easy maintenance and lower energy consumption all contribute to real cost reductions for the manufacturer.

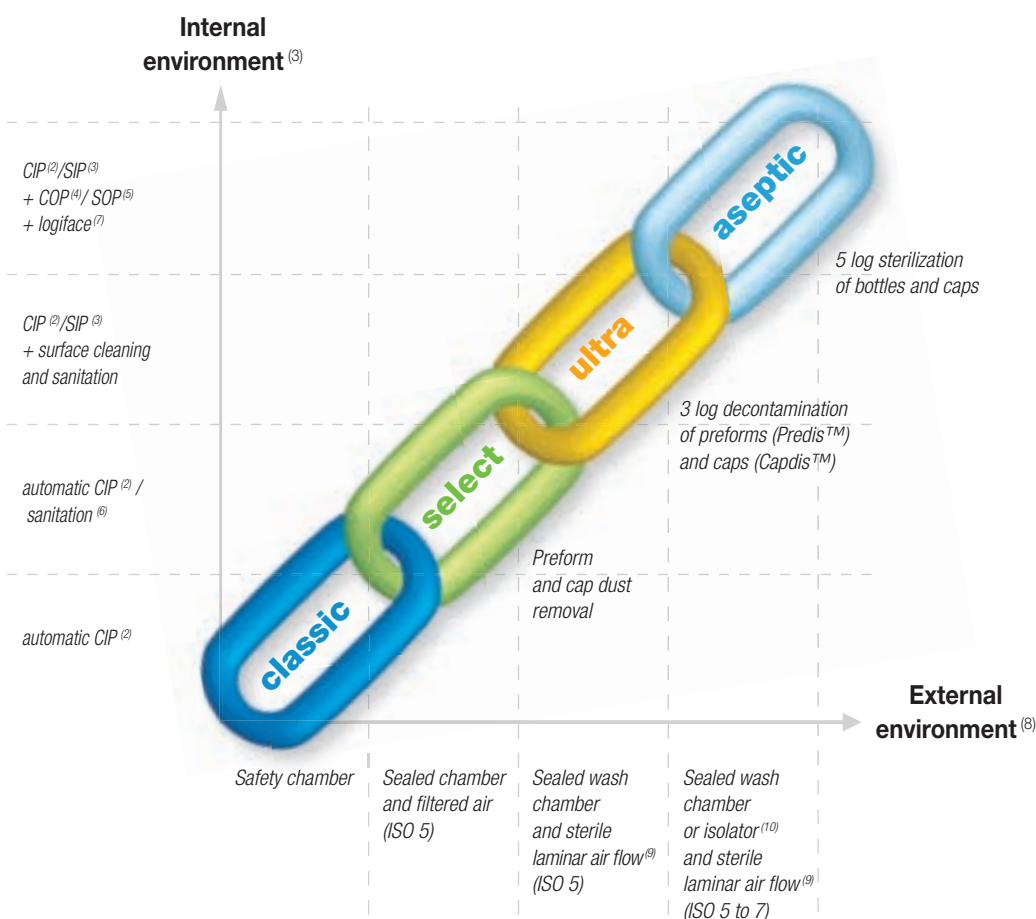
INTEGRATED PET PACKAGE PRODUCTION IN A SINGLE MACHINE



Filling environment, under control

A CUSTOMIZED, CONTROLLED ENVIRONMENT FOR YOUR PRODUCT

Sidel has developed an approach based on four filling environments: Classic, Select, Ultra and Aseptic. These four categories enable the Combi to guarantee a controlled environment before, during and after production to satisfy your hygiene requirements. Each environment represents a different level of cleaning and sanitation of product circuits and machine surfaces and a specific level of controlled air flow protection of the filling-capping circuit.



⁽¹⁾ Internal environment: This encompasses all parts of the filler that come in direct contact with the product such as product filling tubes, the tank and filling valves. These internal circuits are cleaned, sanitized and sterilized to varying degrees depending on your product's requirements and in order to be consistent with any heat processing involved in production.

⁽²⁾ CIP : "Cleaning In Place": Internal cleaning of the machine's product circuits, without dismantling equipment, using caustic and/or acid wash as needed.

⁽³⁾ SIP: "Sterilization In Place": Internal sterilization of the machine's product circuits, without dismantling equipment, using water under pressure control and heated to 140° C.

⁽⁴⁾ COP: "Cleaning Outside in Place": Internal cleaning of the chamber and external cleaning of product circuits.

⁽⁵⁾ SOP: "Sterilization Outside in Place": Internal sterilization of the chamber and external sterilization of product circuits.

⁽⁶⁾ Sanitation: Phase in addition to CIP that reduces the microbiological load using 95° water and/or fluent steam depending on the equipment used.

⁽⁷⁾ Logiface: A platform that ensures sterile feeding of products, includes CIP/SIP and COP/SOP functions, and controls production of sterile water for sterile barriers.

⁽⁸⁾ External environment: Consists of the space between the filling/capping carousel and the walls of the chamber. This space is protected from the environment in the filling hall. Protection levels in the enclosure vary depending on the needs of the product being filled.

⁽⁹⁾ Laminar flow: Machine is protected by filtered laminar air that flows at uniform speed of 0.45 m/sec. in the protected enclosure.

⁽¹⁰⁾ Isolator: This design provides protection using a hermetically sealed rigid chamber under sterilized air pressure.



The Combi can be equipped with glove boxes to service the machine without opening it.



Predis™ 3 log dry decontamination of preforms guarantees your product's food safety.

YOUR PRODUCT'S FOOD SAFETY

Sidel Combi equipment offers a choice of configurations for specific hygiene requirements to ensure your product's food safety.

	Classic	Select	Ultra	Aseptic
Treatment of items in production				
UV/preform infeed rail		○	✗	✗
Preform dust removal	○	✗	✗	✗
Dry decontamination of preforms: Predis™			✗	
Bottle sterilization				✗
Cap dust removal with ionized air	○	✗		
Cap sanitation/sterilization: Capdis™		○	✗	✗
Environmental control				
Closed preform hopper (with cover)	○	✗	✗	✗
Pressurized preform hopper		○	✗	✗
Filtered oven air			✗	
40 bar filtration/0.01 microns	✗	✗	✗	✗
40 bar filtration/0.01 microns with active carbon		○	○	○
Controlled air flow protection at transfer (ISO 5)		✗	✗	✗
Pressurization of filling part with smaller enclosure possible		✗		
Isolator				✗
Capping turret with stainless steel components		○	✗	✗
Cleaning				
CIP / Sanitation	○	✗	✗	✗
SIP			✗	✗
COP		○	✗	✗
SOP			✗	✗

○ option ✗ Included Partial list of options

Cutting bottle costs, at the heart of the Combi

CUTTING OPERATING COSTS BY 8 TO 12%*

A Combi can reduce operating costs by 8 to 12% depending on the product being packaged, the package itself and production output. Consider these advantages:

- Fewer machines and less floor space reduce investment and facilitate plant layout.
- The Combi's high overall efficiency and increased production time (due to faster format changeovers and maintenance procedures) improve return on investment.
- Savings in labor, raw materials, spare parts, and energy consumption reduce production costs.

OVERALL EFFICIENCY UP 2 TO 4%

Traditional production lines require accumulation and an air conveyor or mechanical storage between the blow molding machine and filler in order to smooth out any mini-shutdowns. But the Combi relies on perfectly synchronized, high-performance blow molding and filling functions and positive bottle transfers that are 100% reliable. Combining several functions on the same piece of equipment reduces interface problems and improves overall efficiency. In fact, our customers have confirmed that the Combi regularly improves their overall output by 2 to 4%.

Cost center	Savings
Investment in equipment and structures	5%
Floor space (in m ²)	15 to 30%
Operation of blow molding, filling and capping	Up to 1 station
Energy and fluids	5%
Overall efficiency	2 to 4%
Maintenance (labor)	About 10 hours/month
Parts	5%
Bottle weight	5 to 10%

* Savings on Combi compared to traditional line (blow molding machine, air conveyor, rinser, filler-capper) at 36,000 bph, machines of same generation. These figures don't take into account inherent savings from Sidel's latest technological developments in blowing and filling.





The Combi concept is built on highly reliable rotary kinematics and perfectly synchronized blow molding and filling.



The Combi is especially well-suited to high speed applications; its overall efficiency is unrivaled.



The Combi's design ensures very efficient format changeover times.

REDUCED ENERGY CONSUMPTION

AIR

- «Low pressure» bottle bases
- Lighter bottles
- Blow molding air recycling (optional)

ELECTRICITY

- Less heating for lighter bottles
- Filling enclosure 80% smaller (optional)
- No air conveyors

WATER

- No rinser
- Air rinsing of preforms
- Base cooling water recycled for carbonated beverage applications (optional)
- 65% of sterile rinsing water recycled (aseptic applications)

FORMAT CHANGEOVER TIMES 20% FASTER

Any reduction in format changeover time increases a machine's availability. Advances in blow molding stations, the use of grippers for transfers and the elimination of air conveyors and rinsing machines all help reduce service times on the Combi.

In addition, recipes on the operator interface all automatically handle settings for preform infeed, oven, blow molding process and filling volume. This eliminates the need for much manual servicing on the Combi and guarantees far greater production flexibility.

For example, to switch from a 1.5-liter bottle to a 0.5-liter bottle on a Combi running at 36,000-bph, a format changeover takes two operators just one hour.

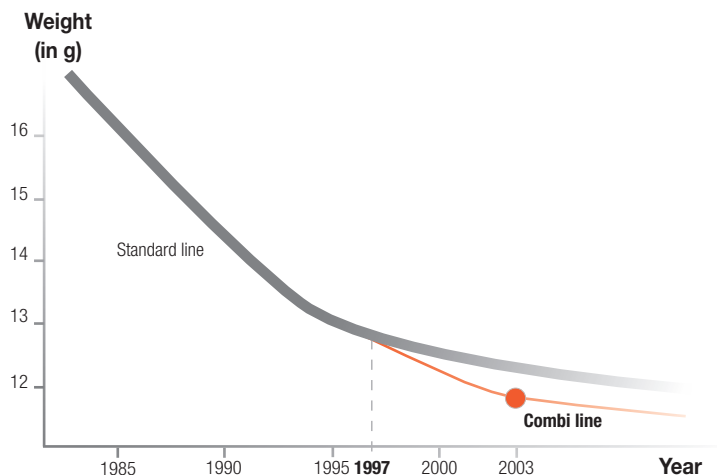
BOTTLE LIGHTWEIGHTING

Because of the neck-handling and positive transfer of bottles between blow molding and filling, the Combi is not bound by the limitations imposed by air conveyors. This expands the possibilities for bottle shapes and lightweighting. Only the mechanical properties of the full bottle, like top load and sidewall strength, need to be taken into consideration, and Sidel warrants the performance of the finished product - a filled, capped bottle.

In this way, the Combi truly offers greater shape design freedom and the ability to package lightweight

bottles at very high speeds. Sidel's knowledge in preform and shape design have made it possible to make lighter bottles, which is key to reducing bottle costs since raw materials represent 65 to 80% of the total cost of an empty package. In addition, thinner preform walls combined with total process control result in significant savings because blow molding pressure is reduced, and less energy is used for thermal preform conditioning.

Weight of 0.5-liter bottle of still water (neck 30/25)



A Combi technology for every product

The Combi incorporates Sidel's extensive blow molding and filling expertise along with advances specifically developed for this particular equipment range.

SECURE INFEEED OF ITEMS ENTERING MACHINES

- Preform infeed with a built-in recycling conveyor and nested preform ejection system guarantee consistent, continuous infeed on the Combi.

- Cap infeed ensures every preform that is blown and filled is also capped thanks to upstream accumulation before the capping turret.

RELIABILITY: POSITIVE TRANSFER AND SYNCHRONIZATION

Positive neck transfer by wheels, which eliminate any chain or belt transfer, ensure that bottles are continuously grasped underneath the neck between the various functions without any drift in performance over time. Two separate asynchronous motors drive the Combi's two main functions: blow molding and filling. A motion card automatically synchronizes both functions. This simple, reliable solution eliminates the need for special and costly drives.

ERGONOMICS: A SINGLE CONTROL TERMINAL

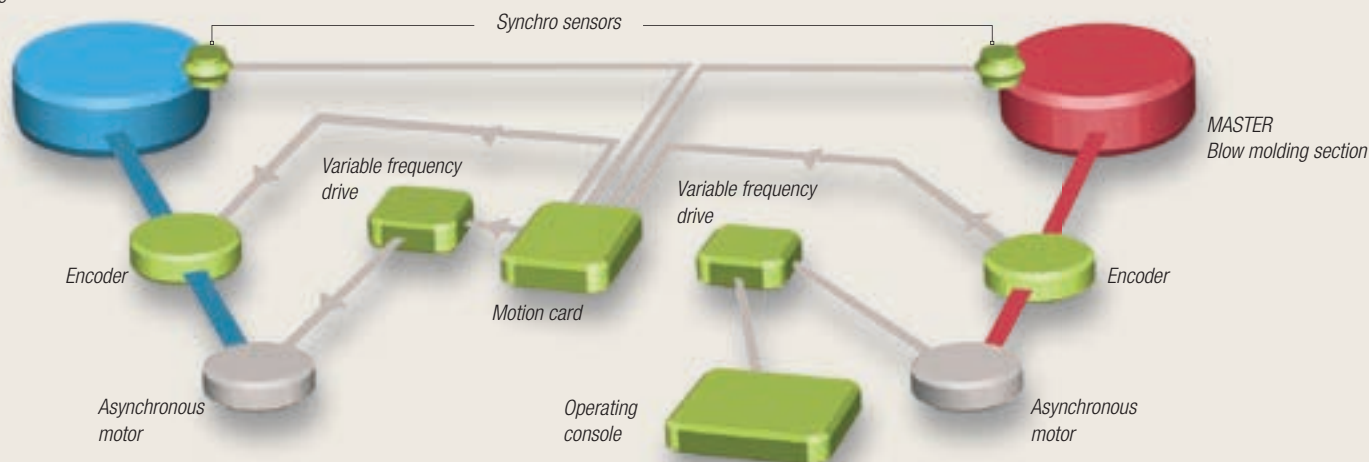
Start-up and operation of the Combi are handled from a single operator terminal equipped with color touch screen and intuitive menus. At this terminal, all information and alarms for production tracking, from preform infeed to bottle capping, are located together. When not in production, the blow molding and filling parts of the equipment are readily and independently accessible for quick and easy maintenance. For example, technicians can perform a mold changeover during CIP or COP.

COOLING PETALOID BASES WITHOUT RINSER FOR CSD APPLICATIONS

During CSD filling, pressurization must not alter the bottle base, an amorphous zone that is still hot after the blow molding phase. The Combi has an adjustable, oriented cold water spray that stabilizes the base while bottles are on the transfer table. This quenches the base, setting the material and improving stress crack resistance. The cooling water can be recycled.

BLOW MOLDING AND FILLING: ASYNCHRONOUS MOTOR DRIVE

SLAVE
Filling section



FILLING TECHNOLOGIES ADAPTED TO THE DEMANDS OF YOUR PRODUCT



Flow meter filling
A flow meter measures volume and controls filling valve closing (electro-pneumatic or electromagnetic control).



Level gravity filling
The filling level is reached when the liquid reaches the vent tube. The volume is defined by the bottle.



Level filling with probe
An electronic probe measures the level and controls filling valve closing.



Isobarometric volumetric filling
Filling with counter pressure for carbonated liquids; filling by gravity or still beverages. The volume is defined by a pre-set enclosure.



Gravimetric filling
Gravity liquid filling by weight control. Weight of liquid filled is measured by an electronic scale, which controls the opening and closing of the filling valve.



Mechanical volumetric filling
The volume of liquid is defined by a cylinder and one moving piston controlled by a cam follower.



Electronic volumetric filling
The volume of liquid is defined by a cylinder and one moving piston each actuated by a brushless motor drive controlled by an electronic interface.



Hot filling*
Gravity filling of liquid to filling level with product recirculation.

** Coming soon*

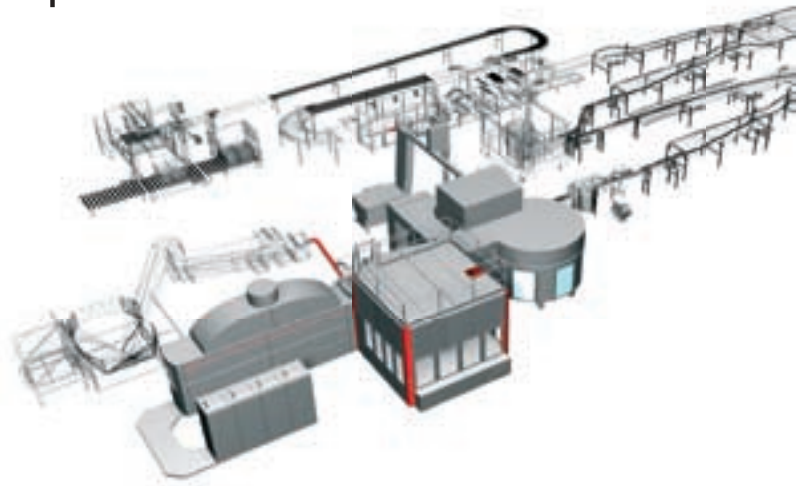
- Still beverages
- Sparkling beverages
- Juice, tea, isotonic drinks
- Milk and dairy products
- Other products

A winning strategy for top-notch line performance

COMBI OFFERS COMPETITIVE ALTERNATIVE TO TRADITIONAL LINES

The Combi improves line layout and ergonomics. It reduces a line's overall footprint and cuts investment costs. When paired with the Sidel accumulation table-combiner, a Combi can save 30 to 40% on floor space compared to conventional lines. Since the Combi is located across from the labeler, one person can operate both machines, with the second operator handling end of line operations. The proximity of the operators to key equipment is vital to guaranteeing final production yield.

Traditional lines must be designed to accommodate «overspeed» and «accumulation time» to guarantee the line's optimum yield. In other words, the filler and peripheral equipment (pasteurizer, carbonator, and mixer) must be oversized. However, on a Combi, blow molding and filling are synchronized to produce at the same speed. Consequently, yield on the Combi surpasses that of traditional lines; filler-related processes are stabilized, and there is no need for overspeed.



Grouping functions together means that just two operators can run a high-speed line.

COMBI OFFERS COMPETITIVE ALTERNATIVE TO TRADITIONAL LINES

	Traditional solution	Combi
Number of machines needed to blow mold, fill and cap	3 for in-line solution 5 for solution with storage silos	A single machine
Labor needed for start-up and operation	Usually 2 operators	A single operator, simpler start-up, visibility of entire process
Footprint	More surface area required, layout more complex	Compact design
Items in production	Number depends on accumulation necessary	Fewer items in machine
Hygiene of machine environment	Controlled environment needed after rinsing	Controlled environment starting from preform infeed
Bottle quality and material loss	Contact between empty bottles: scratches and crushing possible, bottle lightweighting limited	100% positive neck transfer, total bottle protection, possibility for complex shapes and bottle lightweighting
Format changeover time	Complete format changeover on each machine	Limited to mold and capper starwheel changeover (with grippers optional)
Maintenance time	Multiple machines = more maintenance	Single machine = less maintenance
Spare parts	Consumption depends on number of machines, heavy inventory requirements	Consumption and inventories reduced
Energy	More equipment = more consumption, rinser water consumption	Less equipment = less consumption



BROAD RANGE OF EQUIPMENT HANDLES OVER 60,000 BOTTLES/HOUR

Sidel offers a broad range of Combi equipment to produce bottles in a wide variety of shapes at speeds ranging from 10,000 to over 60,000 bottles/hour for all kinds of liquids.



From 18 to 160 filling nozzles depending on output and filling technology

A CHOICE OF CONFIGURATIONS ADAPTED TO YOUR PRODUCTION OBJECTIVES

	Classic	Select	Ultra	Aseptic
Process and quality				
Oven air recycling for heat stabilization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vision control system for preforms, bottles and caps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High efficiency and cost reduction				
Blow molding air recovery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Automatic dummy bottle insertion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large capacity cap hopper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance				
Automatic lubrication of blow molding and filling systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Centralized manual lubrication of capping part	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility				
Customization parts for different bottle capacities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Modification for sport caps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

optional

Partial list of options

For the success of your project

AN ARRAY OF SERVICES

As with all Sidel Group equipment, customers purchasing Combi equipment receive Sidel support throughout the useful life of their product:

- Professional project management,
- Expert package design,
- Hundreds of technicians around the world specialized in installation, start-up and maintenance,
- 30 OEM training and professional instructors to help you better operate and maintain your equipment,
- Twenty parts supply locations worldwide.

SIDEL'S DEDICATED COMBI TEAM

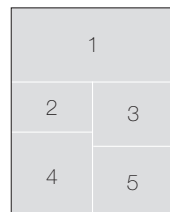
Sidel's Combi team is focused on developing a complete range of machines suited to your needs. From an initial offer to equipment start-up, the team coordinates everyone involved in a project giving customers the advantage of a single contact for the oversight of their job. This project management approach is one of the reasons why Sidel has been so successful in the integrated equipment business. In fact, three out of four integrated machines are Sidel Combis.

A COMPLETE RANGE OF PERIPHERAL EQUIPMENT

A full range of peripheral equipment supports the complete Combi offering:

- 40 and 7 bar compressors for compressed air supply,
- Chiller for water for oven ramps, molds and petaloid base stabilization system,
- Camera monitoring system for caps, preforms, empty and full bottles,
- Cleaning foam generating system,
- PAA and sterile water system,
- Diverse range of CIP units,
- Logiface for sterile feeding of products and grouping of CIP/SIP and COP/SOP functions,

- Tankless ICS (integrated CIP system) reduces the amount of solution used for the still water Combi. Located with the machine infeed valve skid, the system takes up very little space.
- Carbonation machine and mixer for CSD preparation.



- 1 - Thirteen instructors help you operate and maintain your packaging lines at peak performance.
- 2 - Six hundreds technicians specialize in equipment installation, start-up and maintenance.
- 3 - Five centers of expertise manage customized production line projects.
- 4 - The logiface ensures sterile feeding of products and grouping of CIP/SIP and COP/SOP functions.
- 5 - Fifteen draftsmen design packages to your product's specifications.





www.sidel.com

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