



Sensitive products

Customized solutions

The processing of sensitive beverages requires a high degree of technical competence and an in-depth knowledge of the product. To offer you high-quality ultra clean, hot fill and aseptic solutions, Sidel has a range of experts who can work alongside you in all stages from packaging development, through filling right up to distribution, thereby ensuring that the product

is produced in complete safety. Sensitive products include a broad range of beverages: from fruit juices and dairy products, to isotonic drinks, tea and flavored water. Moreover, the demand for new beverages continues to grow.

Sidel provides solutions for all customers, no matter what packaging or format they may require.

OUR VIEW OF THE SENSITIVE PRODUCTS RANGE

Each product has specific needs in terms of processing, filling and shelf life, because each has its own organoleptic and microbiological profile. We can subdivide products into different categories according to their sensitivity. See the figure on your right.



Pasteurized milk



Fresh juice & smoothies



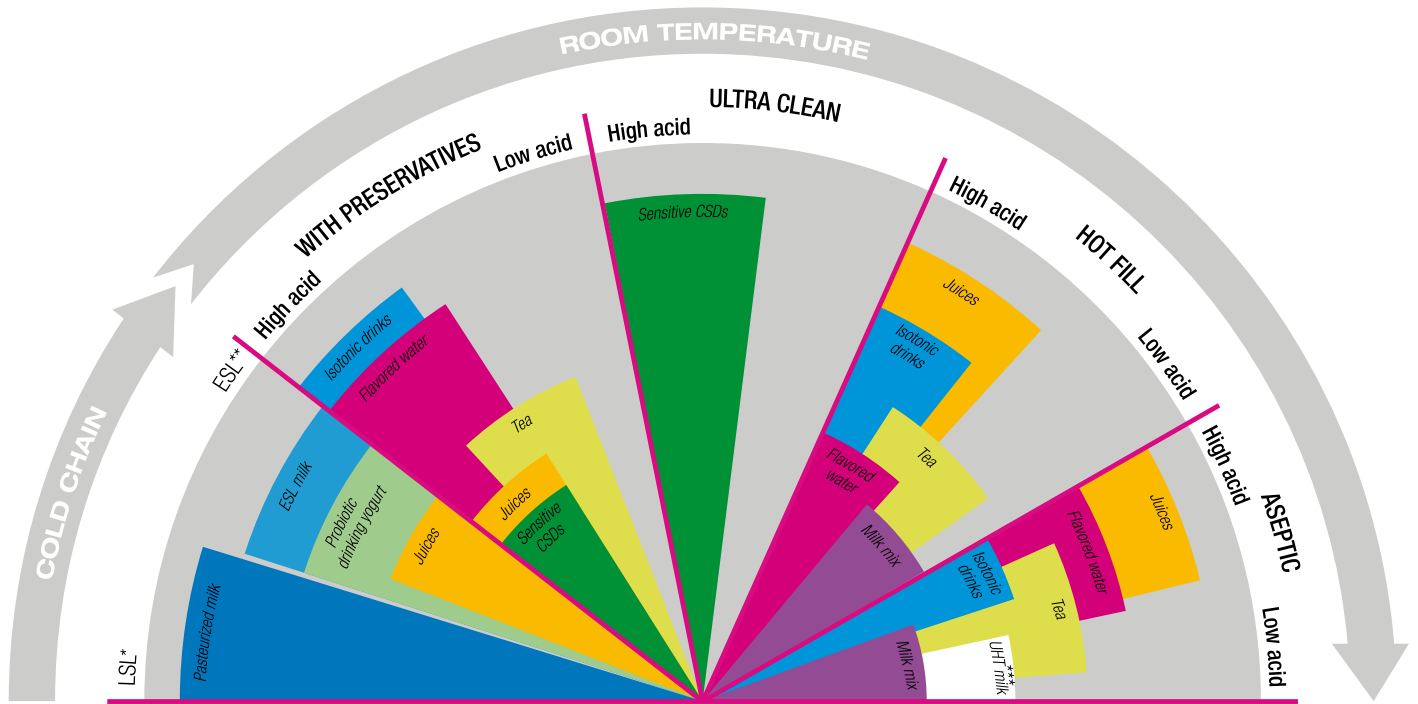
Drinking yogurt



Fruit juice



Carbonated fruit juice



* Limited Shelf Life ** Extended Shelf Life *** Ultra High Temperature



Isotonics



Flavored water



Tea



Milk mix



UHT milk

Product shelf life

Sidel is keenly aware of the importance of shelf life for your products. Consequently, we have developed in-depth expertise of this vital subject.

Shelf life is the period of time a product can be stored before its quality falls below a minimum threshold. A product whose shelf life has expired can, however, still be considered safe from a microbiological point of view, despite having lost its organoleptic properties. Changes in these characteristics can be recognized via various criteria such as appearance, taste, smell, consistency, viscosity, sedimentation and the separation of fats.

Our expertise enables us to predict the product's behavior during the bottle/product shelf life.

Several key factors may cause deterioration of a sensitive product: light, oxygen, microorganisms, filling conditions and storage temperatures. Sidel has developed various solutions for all these issues.

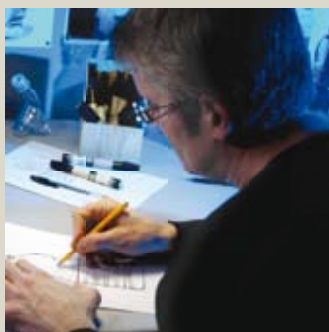


Our solutions to tackle the main issues that can affect sensitive products

Light	Oxygen	Microorganisms
<p>PERCEPTIBLE CHANGES</p> <ul style="list-style-type: none"> - vitamin deterioration - change of color (browning) - change of taste - change of consistency <p>CRITICAL AREAS</p> <ul style="list-style-type: none"> - bottle - cap 	<p>OXIDATION</p> <ul style="list-style-type: none"> - breaks down vitamin C - changes color <p>CRITICAL AREAS</p> <ul style="list-style-type: none"> - surface of the bottle - closure - head space - O₂ level in the product 	<p>PROLIFERATION OF GERMS</p> <ul style="list-style-type: none"> - alters taste - changes appearance - changes smell - changes color <p>CRITICAL AREAS</p> <ul style="list-style-type: none"> - product quality - product processing - hygiene - clean bottle and cap
Solutions	Solutions	Solutions
<p>PACKAGING</p> <ul style="list-style-type: none"> - multi-layered PET with an "opaque" layer - SiO₂ barrier - sleeve barrier - closure with light barrier 	<p>PACKAGING</p> <ul style="list-style-type: none"> - multi-layered PET - coated bottles (Actis™) - oxygen scavenger for bottle and cap <p>FILLING SYSTEMS</p> <ul style="list-style-type: none"> - nitrogen gas flush - liquid nitrogen injection - double flow valve to minimizes foaming 	<p>PRODUCT</p> <ul style="list-style-type: none"> - heat treatment - cold storage - addition of preservatives - microfiltration <p>PACKAGING</p> <ul style="list-style-type: none"> - decontamination of preform - decontamination of container and cap <p>FILLING ENVIRONMENT</p> <ul style="list-style-type: none"> - ultra clean, aseptic, hot fill



The best PET materials and packaging solutions for your beverages



CHOOSING THE MOST SUITABLE MATERIAL AND PACKAGING SOLUTION

Sidel is able to evaluate and identify the most suitable materials, bottle shapes and closures for your beverages by analyzing their interactions over time, in a given environment. For this purpose, we have 10 experts in the fields of chemistry, microbiology, food science, filling processes and packaging materials.

Thanks to a pilot line for aseptic production, we can reproduce on a reduced scale the industrial steps involved in packaging your products, from processing to filling. This offers the possibility of trying out different PET bottles and then testing them under conditions similar to plant conditions, in accordance with pre-set criteria: shelf life, storage conditions (variation in temperature and light) and distribution mode (room temperature or cold chain). Physical, chemical and sensory analyses are used to observe how the product behaves in the package and to study different indicators: barrier properties of the package, vitamins (A, B2, C, etc), beverage color, dissolved oxygen in the product, etc. Beverage sterility is also checked in the microbiology lab.



A UNIQUE COMPREHENSIVE OFFER

From bottle design to package/product shelf-life evaluation, Sidel helps you launch your sensitive products in PET bottles, handling everything from graphic design to organoleptic assessment of your product and the release of new beverages, new recipes or new bottle design.

DIFFERENTIATED PACKAGING

Thanks to its great design potential and mechanical performance, PET is a perfect alternative for juice, milk or other dairy products, which are currently mainly packaged in HDPE, cardboard or glass. Sidel also works in partnership with resin and closure suppliers in order to develop new solutions (single- or multi-layer PET, recycled PET, PET with additives or colorants) that will help better preserve your sensitive products

GUARANTEEING THE MECHANICAL PERFORMANCE OF YOUR PACKAGING

Sidel manages the compatibility of the packaging with your bottling equipment, by means of feasibility tests for blow molding, filling and conveying.

Filling technologies

LSL (LIMITED SHELF LIFE)

ESL (EXTENDED SHELF LIFE)

STANDARD WITH PRESERVATIVES

ULTRA CLEAN CARBONATED

5-15 days

< 90 days

Shelf stable with preservatives

Shelf stable with no or low preservatives

Low & high acid dairy

Low acid, liquid dairy products, fresh juices, ESL milk.

JNSDIT (juices, nectars, still drinks, isotonics, teas)

Sensitive CSDs (Schorle, spritzers)

Open chamber

Clean chamber

Hygiene chamber

Isolator

Gravimetric: by weight or flow-meter

Gravimetric: by weight or flow-meter

Volumetric or level

Flow-meter

4-8°C

2-6°C

Ambient

Up to 20°C

Stand alone or Combi

Combi Predis™

Stand alone

Combi Predis™

Dedusting for preform and cap

H₂O₂ vapor for preform and cap

H₂O rinsing or none

H₂O₂ vapor for preform and cap



Sensofill™ FMm



GWm in Combi with Predis™



Eurotronica FM-S



GWm



Combi Predis™ FMm



Selecta S



Combi Predis™ Eurotronica FM-C Ultra Clean

HOT FILL

**HOT FILL
ULTRA CLEAN**

ASEPTIC (WET)

ASEPTIC (DRY)

Shelf stable

Shelf stable

Shelf stable

Shelf stable

Low & high acid still drinks

Low and high acid still drinks

High acid & low acid JNSDIT
& UHT milk

High acid JNSDIT

Open chamber

Isolator

Isolator

Isolator

Mechanical or flow-meter

Flow-meter

Flow-meter

Flow-meter

85°C (PET); ≥ 90°C (glass)

≥ 85°C (PET only)

Ambient

Ambient

Stand alone

Stand alone

Stand alone or Combi

Combi Predis™

Water or purified water
(chlorinated or ionized)

Peracetic acid (PAA)

Peracetic acid (PAA)

H₂O₂ vapor



Veloce/Veloce FM



Sensofill™ FMa



Europa HF



Veloce FM Ultra Clean



Combi Sensofill™ FMa



Combi Predis™ FMa

How to choose the best technology for your needs

Sidel has a broad range of technologies for packaging sensitive products. On the strength of our expertise, we can support you right from the outset in choosing the most suitable solutions for your requirements.

Each type of technology is designed

for different product treatments, which can be more or less intense according to product sensitivity, shelf life and distribution chain.

The table below shows the impact of different processes on the various technologies.

▲ = low impact
▲▲ = medium impact
▲▲▲ = high impact

HOW EACH PROCESS IMPACTS ON VARIOUS TECHNOLOGIES

Technologies	Product processing	Control of product temperature	Control of filling environment	COP/CIP	Sanitation of bottle and closure
LSL (Limited Shelf Life)	▲	▲▲	▲	▲▲	▲
ESL (Extended Shelf Life)	▲▲▲	▲▲▲	▲▲▲	▲▲▲	▲▲▲
Regular with preservatives	▲	▲	▲	▲▲	▲▲
Ultra clean (sensitive CSDs)	▲▲▲	▲	▲▲▲	▲▲▲	▲▲▲
Hot fill	▲▲	▲▲▲	▲	▲▲	▲
Hot fill ultra clean	▲▲▲	▲▲▲	▲▲	▲▲▲	▲▲
Aseptic (wet)	▲▲▲	▲	▲▲▲	▲▲▲	▲▲▲
Aseptic (dry)	▲▲▲	▲	▲▲▲	▲▲▲	▲▲▲







































The solutions shown in the table below are only some examples from the whole Sidel range described on pages 6 and 7. The table indicates the three main advantages associated with each machine to help you choose the solution best suited to your requirements.

Moreover, Sidel's extensive worldwide commercial network enables you to be in direct contact with our experts, who will supply you with further detailed technical information and support at all times during the period of collaboration.

 = good for
 = very good for
 = best for

THREE MAIN ADVANTAGES ASSOCIATED WITH EACH MACHINE

Advantages	Comparison of aseptic solutions			Comparison of hot fill solutions		
	Sensofill™ FMa	Combi Sensofill™ FMa	Combi Predis™ FMa	Mechanical filler	FM filler	Ultra clean filler
 Productivity						
€ TCO						
★ Food quality						
 Sanitation performance						
 Flexibility						
 Maintenance cost						
 Easy to use						
 Easy to implant						
 Sustainability						

Customer support

Our know-how at your disposal

The Sidel Group relies on a team of experts in the field of aseptic packaging to guarantee that your equipment performs optimally.

Sensitive products are by definition the most vulnerable to external factors such as bacteria, temperature and light. They are thus the most

exacting of all when it comes to packaging and that is why Sidel provides assistance throughout the life cycle of your line.



FOR OPTIMAL PERFORMANCE

For developing new sterilization technologies, we do aseptic laboratory tests. Moreover, to support you during the whole life cycle of your machines, we analyze the most sensitive processes in order to identify the areas that

can be improved to optimize results. All of this is done on the basis of certified, repeatable working methods which guarantee objective evaluations. In collaboration with universities, we also study how the sterilizing agent interacts with microorganisms, organic substances and packaging.

Artificial contamination of bottles and closures for challenge tests



SIDEL CARES ABOUT QUALITY

To guarantee infallible results, we carry out filling, closure and process tests to check the feasibility and attainment of all the rating specifications you request (such as filling times or the absence of

foam), using your end products. Sidel supports you throughout the whole line life cycle, also providing advice on bottling new products.

Filling test on sensitive products



CUSTOMIZED SOLUTIONS

We bring our experience to bear directly on proven and new equipment by working in your plant, providing you with assistance as regards microbiological and chemical aspects, process, engineering and automation, always with a view to

optimizing quality, efficiency and safety.

Field support

Life Cycle Management

An approach focused on value creation

The Sidel Group has a comprehensive, simple and efficient solution for optimizing the return on your investment: Life Cycle

Management This approach is based on the implementation of a close collaboration, with a view to accompanying you in maintaining

and improving the performance of the machine for its entire life cycle. This partnership will provide you with a customized offer, with

foresight and innovation at the core of this long-term service solution.

WORKING TOWARDS PERFECT HYGIENE

Options & Upgrades respond to all of your requirements when tackling a new market or benefiting from the best technological innovations. We even provide ultra clean solutions

for existing plants in order to ensure perfect production hygiene and high-quality sensitive products.



Predis installation on an existing machine

CUSTOM MAINTENANCE

Sidel's maintenance solutions form the ideal support for the optimum management of your line. Training ensures quality transfer of both skills and knowledge. Our field experts are a guarantee of rapid response to your support needs.

Original spare parts, handled by our specialists, will be provided in the fastest possible time.



Sidel coaching and know-how

MAXIMIZED PRODUCTIVITY

With our expertise and high-precision instruments, the return on your investment will be maximized. Our team of experts analyzes your line's potential and corrects all the weak points in its operation via the Line

Audit. Our data acquisition system, EIT™, was designed entirely for improving productivity. Coaching provides an opportunity to train your staff in performance management.



Servicing performance

