



# HARD SWEET BISCUIT & CRACKERS





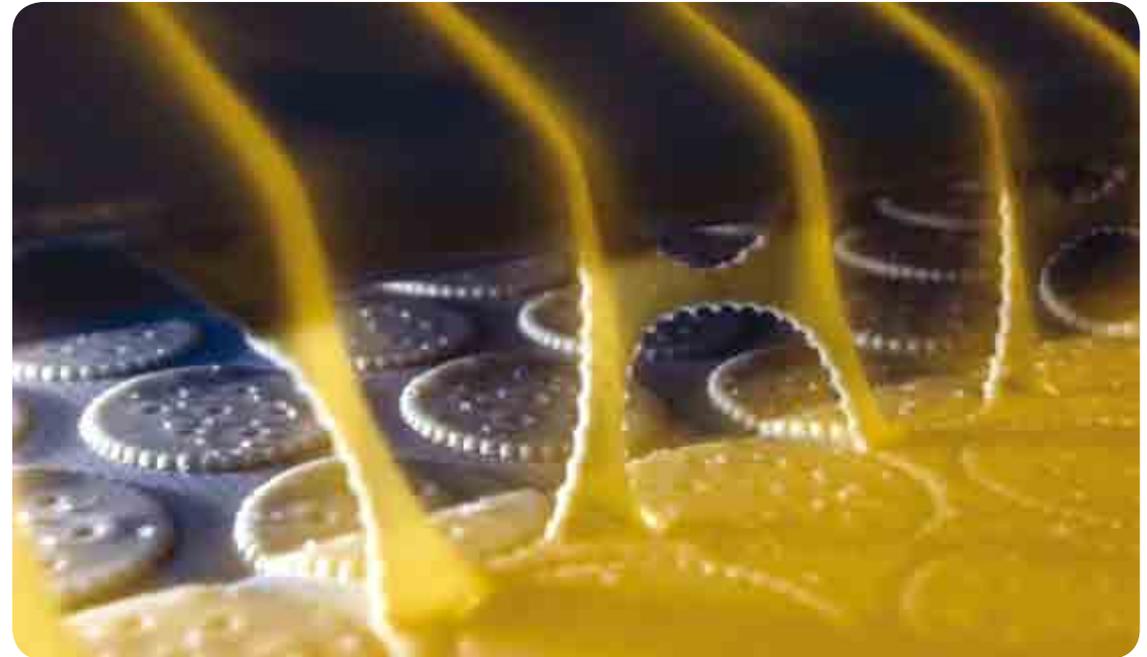
## The basic ingredient. We know how.

Ever since we first started, in 1962, we have always felt ourselves to be part of our customers' recipes. This is why we have always given them our technology, passion, reliability and quality.

Being “**the basic ingredient**” is not just a motto for us but a real, constant commitment. We have put innovation at the heart of our business, always pushing the boundaries of our experience. We never take it for granted, always making it available to our customers around the world.

Expanding out expertise, broadening our scope, always driven by passion and daring: what we call **Know-how** is a goal that we shift forward by one step every day. This is positive energy and one that we want to share with all our partners.

# The process



**Hard sweet biscuits and crackers** are manufactured on forming lines which consist of a sheeter and a set of gauge rolls plus a lamination stage in the case of soda and cream cracker productions. Our **experience** states that a more regular final biscuit and less production problems are obtained by gently processing the dough sheet. The dough mass formulation and the way it is handled throughout the gauging process are the key factors to avoid stress to the dough sheet.

The line is completed with **the rotary cutter** - one or two roll type - the scrap pick up and return conveyor. Devices like sugar/salt sprinkler, egg wash, glazer or ink printer can be fitted on the sheeting line to increase the variety of products. In order to avoid the “checking” to the products, it is essential to give a long, natural but hygienic cooling to the baked biscuits.

Product stacking is a critical stage where expertise is essential in order to have high efficiency production.

These sheeting lines can be supplied up to **2.000 mm in width**.

# Mixing

**Different types of dough** require **different mixing** processes.

Imafori has developed long term and tight technical liaison with the most prestigious companies of the sector with the scope to offer the most suitable and optimum incorporation of the ingredients into the dough.

Our engineering staff ensures that the **mixers would perfectly integrate** with our machineries in terms of specifications and performances, as well as that all safety standards and rule in force in the country of final destination are fully respected.



**Vertical planetary mixer** suitable for soft dough such as wire-cut or deposited as well as for rotary moulded dough.



**Horizontal mixer** suitable for biscuit, cracker or fermented dough in general. The shaftless mixing arm can be single or of a double "sigma" shape.

The main ingredients are usually fed automatically from the top, while small ingredients can be added manually.

**Vertical spindle mixer** normally used for crackers. It can be made with two or three vertical arms depending on the production capacity required.

The loading station for the main ingredients can be seen on the side.



# Dough feeding system

Different solutions can be offered depending on the type of dough being used, on the space available and on the layout of the building. Our engineering staff can provide **tailor-made solutions** ensuring that all safety standards and rules in force in the country of final destination are fully respected.



Tub-lifting and tilting system  
from ground floor with operator  
**safety ensured by openable gates.**



Tub tilting system  
from ground floor.



Stainless steel dough feeding by means  
of hopper and pneumatic guillotine  
system, suitable for handling  
**hard sweet-biscuit or cracker**  
dough as well as soft dough.

Note the presence of a metal  
detector on the outfeed conveyor.



Details of the **pocket rollers** on the dough feed system.



Picture illustrating the principle of operation of the dough portioning system by means of **"pocket rolls"**. The use of a cutter on the next conveyor can be avoided.



Small footprint dough feeding system suitable for soft and rotary moulded process.



# Forming equipment

During the sheeting process, the dough is gradually reduced in thickness from the first sheeter to the final gauge roll.

Depending on the type and texture of the dough to be processed and on the space available, different solutions can be offered:

at the head of the line either a **Three Rolls Sheeter**

or a **Four Rolls Sheeter** can be installed.



## Four Rolls Sheeter.

The unit includes a **pressure gauge** in the compression chamber, which automatically adjusts the speed of the feeding rollers in order to give consistent density to the dough sheet.

Note the free space of 400 mm underneath the machine to ensure **accessibility** during cleaning operations.



## Sheeting system on vertical configuration.

The unit consists of a four-roll sheeter, one set of gauge rolls and a cut & sheet lamination system.

The machine can be configured with **an extra** gauge roll upon request.



Details of the precise and consistent overlapping of dough sheets just out of the Cut & Sheet Laminator.



**Automatic dough-sheet loop control system.**

It is utilized in order to give a constant tension to the dough sheet when entering the nip of the rolls of the final gauge roll. The quality and consistency of the final products are **greatly improved**. No more operator actions are required.



## Sheeting system consisting of 4 gauge rolls.

The final one usually has bigger diameter rolls.  
An operator HMI is installed on each unit, for fine tuning adjustments.



Relaxation web before the cutting stage.



**Two rolls rotary cutter** unit (one for embossing, the other for cutting). Note the clearance underneath the unit which ensures accessibility for cleaning.



Details of scrap pick-up conveyor and the main **control panel** of the whole sheeting line.



# Auxiliary equipment



Fat & Flour are deposited between two sheets of dough through this specially designed distributor.



Sugar/salt sprinkler fitted directly on a wire-mesh recovery system. Different recovery systems can be supplied upon request.



Soda bath unit utilized in the production of snack and pretzel-like products. Two systems can be provided: top sprinkling or full bath.



Ink printer installed between the rotary cutter and the scrap pick-up conveyor.



Idle wheels for softly engraving the dough sheet in cracker production.

# Space saving solution

We can provide flexibility of production in a limited amount of space. We have developed a solution that makes it possible to have a rotary cutter & rotary moulder forming line in a **small footprint**.

**The space is optimized** by realizing a four roll sheeter and two set of gauge rolls in a vertical configuration, followed by a rotary cutter/rotary moulder combined in the same unit. The smart design of the machine makes it possible to switch from soft to hard dough production and vice versa, easily and quickly: an operation that can be done directly by the line operator.



Sheeter and gauge rolls in vertical configuration, followed by rotary cutter/rotary moulder, scraps pick up conveyor and salt/sugar sprinkler unit.

# Flexibility

The modular design of our forming units allows the realization of **different make up configurations** suitable to bakeries' needs or space available.

Even within the small footprint of this type of forming line, the usual unique features of a standard sheeting line are provided, i.e. accurate speed cascade system and uniform product weight control.



Rotary cutter/rotary moulder machine equipped with a washover device.



# Control system

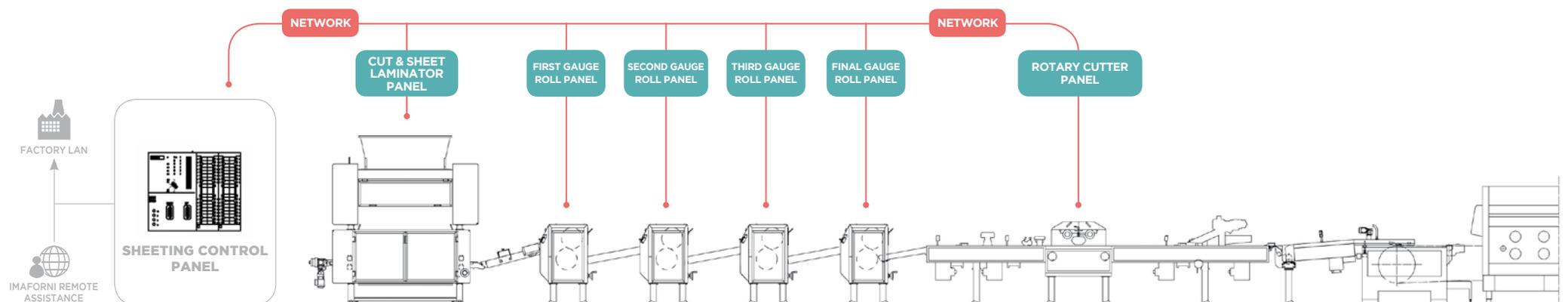


Screenshot of the operator interface which shows the phase-matching between embossing and cutting rolls of the rotary cutter.

The control system of the sheeting line is fundamental for **high and efficient production** standards.

An efficient and reliable cascade control system of all the motors ensures the creation of a **uniform and stress-free dough sheet** which produces final products of consistent thickness and dimensions. The dough-sheet loop control system, consisting of a sensor which detects the loop created by the dough sheet while entering the nip of the final gauge roll, automatically controls the speeds of the upstream equipment in order to make sure that the mass of dough fed to the nip of the final gauge roll remains constant.

The device, introduced several years ago by Imaforni, means that **the operator does not need to intervene personally**. The signals and all the information between the various units are exchanged through a network very similar to that of an office desktop computer system. The main control panel and all the electrical cables are made in compliance with current regulations.



# Post oven equipment

After the oven Imaforni can provide the most suitable equipment for **oil spraying, cooling conveyors** and **curves** to suit the layout of the building, as well as the suitable **stacking system** in order to ensure that, the biscuits or crackers, are nicely regimented on edge on the **packing table**, ready for the subsequent packaging process.

A wire mesh conveyor is usually placed after the oven, to transfer the baked biscuits to the cooling conveyors.





Disk type oil spray machine.



Out of the oven, 1500 mm wide.



Different layouts  
of cooling system.



## Before packing.

Depending on the type, the products are handled differently after cooling in order to be presented **in the most suitable way** at the next packaging stage.

The strips of crackers are aligned and then, by going through a set of top rollers, they are **gently separated** and single portions are created. In the case of biscuits, they are diverted both longitudinally and transversally to be forwarded to the next stacking stage.

There are two stacking systems:  
the **penny stacker** and the **star-wheel**.

The handling of the products after cooling is a very delicate stage of the whole production process, and experience and know-how are fundamental to guarantee a high level of efficiency for the whole line.

Soda cracker strips are laterally aligned before being fully stacked and separated.



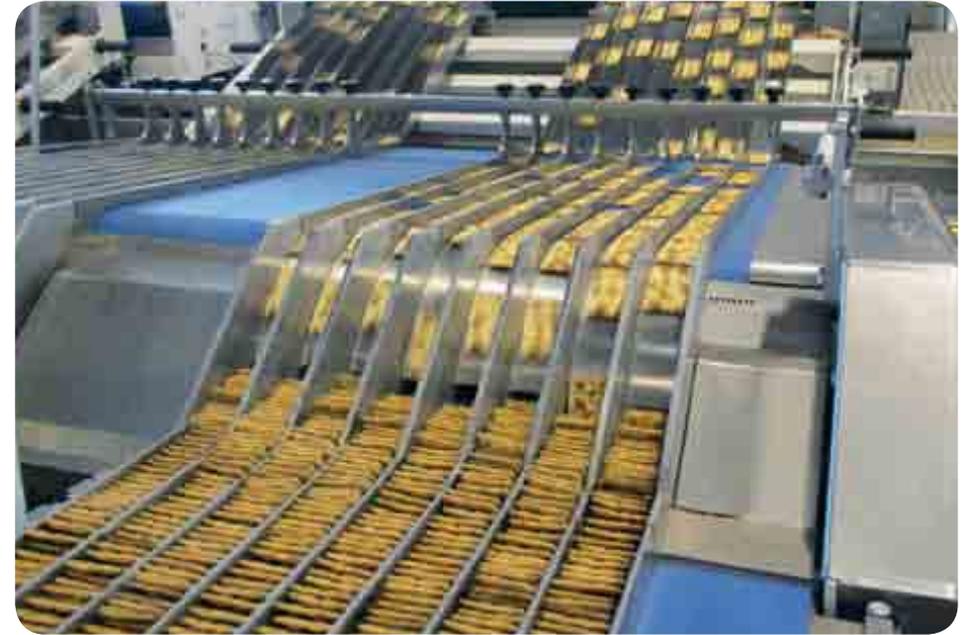
Top rollers gently break the strip of soda crackers to create single portions.







Biscuit stacking system  
star-wheel type.



Stainless steel inclined chute to put the crackers between  
guides, followed by a star-wheel type stacking system.

Channeling board and penny stacker.



Oscillating guides for stacked soda cracker.



Biscuits on edge are automatically  
fed to the wrapping machines.



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