Gémina©

CITRUS EXTRACTOR



Gémina©
Procesos Alimentarios, S.L.

APPLICATIONS

EXTRACTED JUICE QUALITY

The quality of the juice produced by the GÉMINA FOMEX extractor is based on the immediate separation of the fruit fractions during extraction. Its design isolates the juice from the peel, seeds and other components whose prolonged contact could affect the characteristics of the final product.

EXTRACTION YIELD

The GÉMINA FOMEX system is designed to achieve a high juice yield per fruit. Its range of cups allows extraction to be matched to fruit size, efficiently processing different citrus varieties regardless of variations in shape and size.

ESSENTIAL OIL AND PULP RECOVERY



GÉMINA FOMEX extractor

The GÉMINA FOMEX extractor produces juice and recovers essential oil from the peel in a single cycle, keeping both streams separate. This integrated process maximises raw material utilisation and reduces the space and energy required for oil recovery.

Water recirculation reduces consumption and the volume of effluent generated. The quality of the recovered oil allows it to be marketed as cold-pressed oil or used as a raw material for d-limonene production.

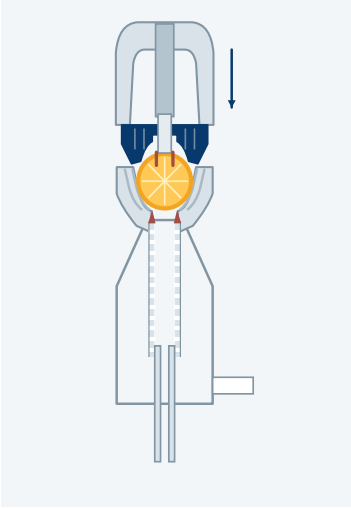
The pulp cell recovery system can be adjusted to deliver the cell size and characteristics required for juice concentrates and other applications. The GÉMINA FOMEX extractor can also be configured to produce Premium pulp, primarily used in natural juices.

This pulp is virtually free of peel fragments, seed fragments and embryonic seeds. Most pulp cells also retain their ability to float.



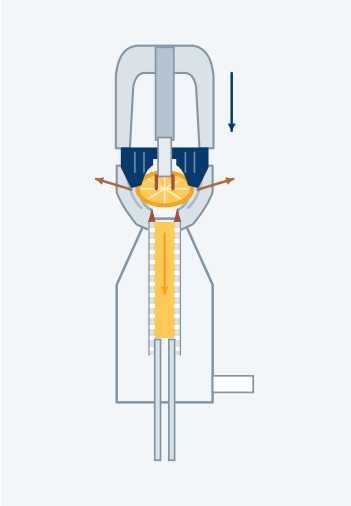
Extraction stages

The extraction cups compress the fruit and direct its contents into the straining assembly, while the peel is discharged separately.



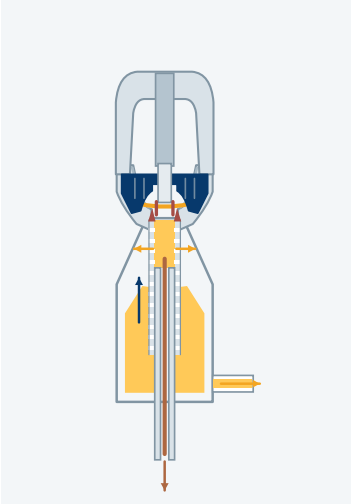
01 Holding and opening the fruit

The upper cup descends and holds the fruit against the lower cup. The cup fingers support the fruit during extraction, fitting between one another in each cycle to prevent the peel from rupturing. During this movement, the cutters make a circular opening at each end of the fruit, facilitating juice extraction and limiting the entry of essential oil from the peel.



02 Compression and peel separation

As the upper cup advances, it compresses the fruit and forces its contents through the lower cutter into the strainer tube. At the same time, the peel is discharged between the cup fingers and a water spray carries away the released essential oil for subsequent recovery.

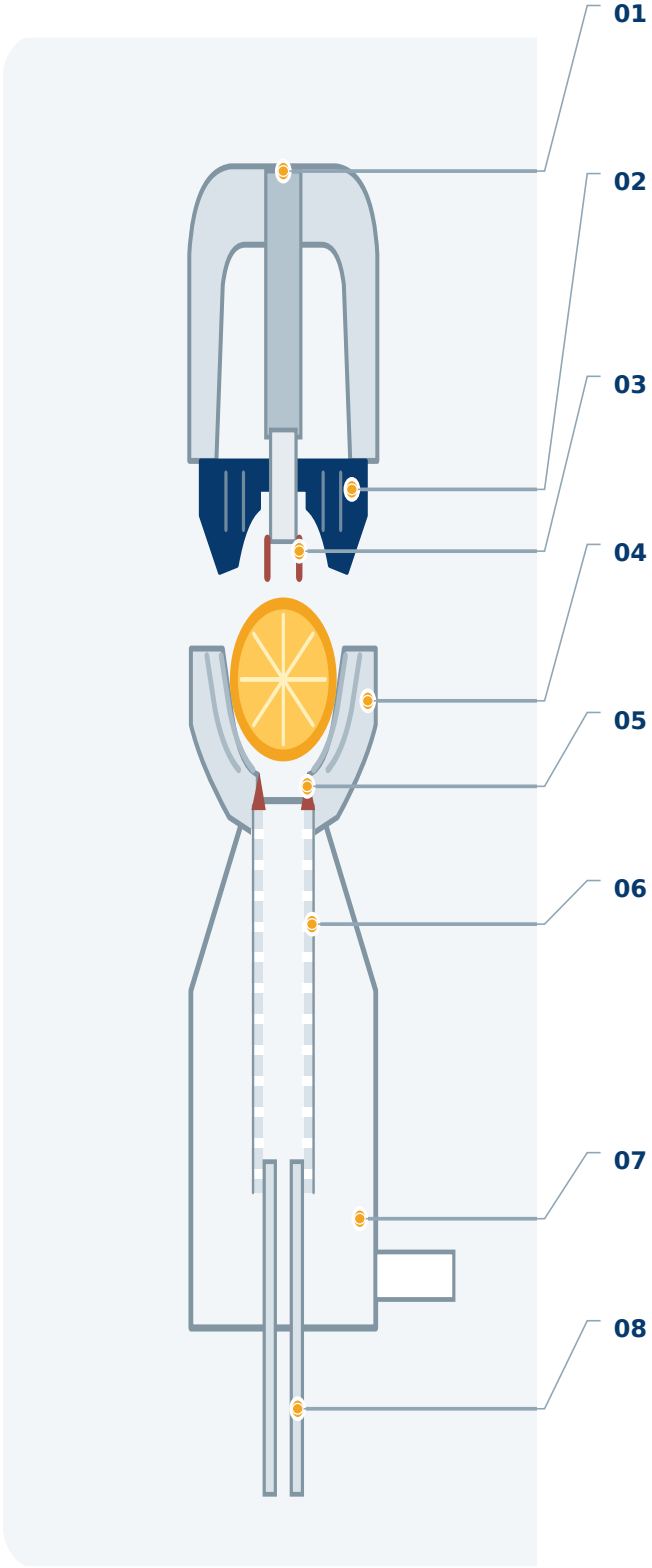


03 Juice straining and residue discharge

The plunger rises inside the strainer tube and compresses the extracted material, forcing the juice through the perforations into the juice collector. Seeds, membranes and residual fibres are discharged through the internal passage of the plunger, in a separate stream from the juice.

Simplified functional diagram. Blue arrows: movement; orange: juice; brown: residues.

Extraction components



01 Cup holder

Supports the upper assembly and transmits the movement required for the extraction cycle.

02 Upper cup

Descends onto the fruit and compresses it against the lower cup, forcing its contents into the extraction assembly.

03 Upper cutter

Makes a circular opening at the top of the fruit to facilitate extraction.

04 Lower cup

Receives and supports the fruit, holding it in position during extraction.

05 Lower cutter

Makes a circular opening at the base of the fruit, allowing its contents to enter the strainer tube.

06 Strainer tube

Separates juice from seeds, membranes and other solids through a perforated surface. Selecting tubes with different perforation sizes allows the pulp content of the juice to be adjusted.

07 Juice collector

Collects the juice passing through the strainer tube perforations and directs it to the machine outlet.

08 Plunger

Rises inside the strainer tube and compresses the extracted material, helping the juice flow into the collector. Seeds, membranes and unstrained residues are discharged through its internal passage.

Simplified functional diagram. Not to scale.

TECHNICAL SPECIFICATIONS

5	100	500
CUPS	CYCLES / MIN	FRUIT / MIN*

*Theoretical capacity for the five-cup configuration at 100 cycles/min, with all cups fed. Actual capacity and juice flow depend on the fruit and operating conditions.

FEATURE	SPECIFICATION
Machine weight	1,800 kg
Installed power	11.5 kW
Cup sizes	2″ · 2-3/8″ · 3″ · 4″ · 4-1/4″

DESIGN AND CLEANING

All product-contact materials are stainless steel. An optional spray CIP system facilitates machine cleaning and integration into the plant’s cleaning sequences.

FROM CITRUS FRUIT TO MULTIPLE PRODUCTS

Gémina can complement extraction with pulp processing and aseptic filling solutions, complete essential oil recovery lines, and production lines for not-from-concentrate (NFC) juice and frozen concentrated orange juice (FCOJ). A range of falling-film evaporators is available for concentration.

Our company

Gémina©
Procesos Alimentarios, S.L.

GÉMINA Procesos Alimentarios, S.L., based in Jumilla, Murcia, a leading Spanish food-producing region, is a leading Spanish company with 25 years of experience in the design, manufacture and integration of systems delivering innovative solutions for the food industry.

You imagine,
we make it happen.



BUSINESS AREAS

Machinery design and manufacture

- Design, manufacture and integration of food processing and aseptic filling equipment.
- All manufacturing is carried out entirely at our facilities.
- All our machinery is CE safety certified and meets the most demanding standards.
- R&D and innovation: committed to technological progress.

Process engineering and design: project management

At Gémina, we enjoy what we do. Our engineering department covers design and calculations, manufacture, assembly, automation and commissioning of equipment and plants, providing comprehensive management of every project we undertake.

We give every project the care it deserves, attending to each process detail and advising you on how to optimise production. Gémina designs each process around your needs, helping your product stand out from the competition.

- Versatility and flexibility: from a turnkey plant to a line extension or the installation of a single unit in a process.
- Adaptability to different environments and circumstances.
- Extensive technical capabilities and experience within our engineering team.
- Comprehensive project management ensures success by reducing risks, costs and lead times.

Our services

1 - Technical support: official Alfa-Laval service provider and distributor

- Maintenance services.
- Installation services.
- Calibration.
- Spare parts services.
- Training services.
- Online production monitoring and troubleshooting.

2 - Automation and robotics

- Tailored process automation: comprehensive solutions.
- Complete process control: SCADA systems, data logging and monitoring.
- Custom robotic applications: a solution for every need.

3 - Comprehensive food quality services

- Optimisation, development and validation of processing and filling equipment and food production processes.
- Consultancy for implementing BRC, IFS, ISO 22000, FSSC and other standards.
- Product development [process + formulation].

Customer service

Gémina's professional services are defined by dedicated, ongoing attention to every customer. Our vocation is to become an operational partner to the companies we work with, placing all our skills and capabilities at their disposal.

Our close customer relationships, technical expertise, accumulated experience and know-how are key reasons why customers choose us and trust our equipment and services.



Industries

The main industrial sectors in which GÉMINA develops projects are:

- Dairy industry
- Tomato industry
- Juice and beverage industry
- Fruit and vegetable industry
- Citrus industry

Product catalogue

Aseptic fillers
Aseptic machines for filling metal drums with pre-sterilised bags with press-fit closures, or for filling cardboard containers.

Bag-in-box
Aseptic filler with automatic feed of small pre-sterilised bags, from 1 to 20 litres, with press-fit closures.

Extractors
Processing a wide range of products to obtain purée free from seeds and skins. Available for pulping or refining.

Heat exchangers
A full range of models and designs, including single-tube, annular, multitubular and scraped-surface units.

Forced-circulation evaporators
High-capacity, high-performance concentrators for products with high solids content and/or viscosity. Multiple stages tailored to process requirements.

Hot/cold break units
Process tomato purée or concentrate, ensuring full or partial inactivation of pectolytic enzymes to preserve pectin.

Laboratory pilot plants
Laboratory pasteurisation and aseptic filling of small samples, including juices, soft drinks, vegetable purées and soups.

Tubular pasteurisers
Design and construction of pasteurisation plants tailored to each specific requirement.

UHT
Low-acid liquids (pH > 4.5; milk pH > 6.5) are treated at 135-150°C for a few seconds using indirect heating or direct steam injection.

Heaters and coolers
Heating products before treatments such as refining or mixing. Cooling before pasteurisation treatments.

Purée extraction plants
Purée extraction from all types of fruit and vegetables, using either cold or hot extraction processes.

Aseptic monoblocs
An aseptic filler integrated into a pasteurisation plant to form a single compact, functional and versatile machine, adaptable to a wide range of products.

Crusher
Thawing stored products such as fruit juices, fruit concentrates, vegetables, purées and sauces.

Piston pumps
Designed to pump viscous products, products with large particles (diced or chopped fruit), or products sensitive to shear stress.

Reverse osmosis units
Reduction of salinity in brackish water and seawater.

Mixing / blending rooms
Recipe-based mixing from a database and transfer of process parameters to pasteurisers.

Vacuum drum emptying
Vacuum unloading of metal drums and aseptic bags in blending rooms in just a few seconds.

CIP systems
Fully automatic chemical cleaning of food processing installations.

Process tanks
Aseptic filling storage tanks for high- and low-pH products, whether liquid or viscous.

Mixing tanks
A wide range of vertical and horizontal tanks, with different agitators and capacities, tailored to process requirements.

Storage tanks
Stainless steel storage tanks with standard or custom capacities to meet customer needs.

Finishers / pulpers
Refining pre-crushed products to remove skins, stems and seeds.

Hammer mills
Crushing of pit-free foods, including vegetables, for raw material processing.

Robotics
Custom robotic depalletising and palletising applications for the start and end of processing and filling lines.



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