

CHAPTER NINE

Filtration

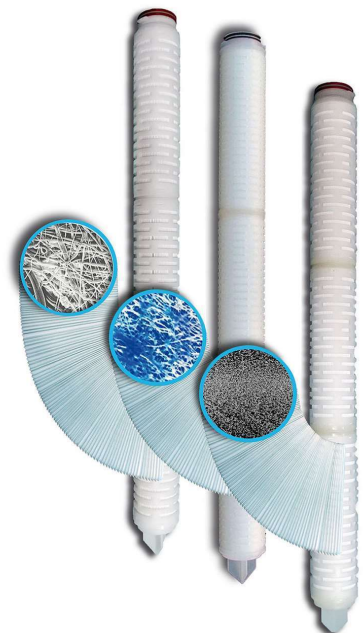
Filtering Cartridges



Final membranes: Absolute PES Plus

In 2021 Danmil developed a new model of final cartridges with Polyethersulfone membranes called Absolute PES Plus. This model is stronger than the previous Danmil Absolute PES, with a more flexible cage and an improved absorbing area surface that for the 30" is equal to 2.4 m² or 25.8 ft²

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ABSOLUTE PES	Absolute PES Plus
Porosity 0,22μ-0,8μ-1,2μ	Porosity 0,45μ-0,65μ
Standard inner core	Stronger inner core (higher temperatures)
4 layers	3 layers
112 foldings	145 foldings
Folding height 10,6 mm	Folding height 10,9 mm
0,68 m ² for 10" module	0,8 m ² for 10" module
New sealer used for welding	New sealer used for welding

Chart 1: Cartridges characteristics

ABSOLUTE PES PLUS CARTRIDGES INTEGRITY TEST

Ask our agents for the parameters to input on your integrity tester or use the following procedure for a manual integrity test:

Procedure for the manual integrity test

Wash the line for 3-5 minutes by opening and closing the exit valve. This step is needed to insure the cartridge membrane is thoroughly wet. Reach 1/1.5 pressure.

Close water inlet in the housing and purge out most of the excess water by opening the Nitrogen valve next to the manometer.

Close the outlet valve in the housing and generate a pressure (1.5 bars for 0.45 and 1 bar for 0.65) using the nitrogen valve next to the manometer.

Open the outlet valve and check for pressure fall. If the pressure holds for 5 minutes the cartridge is in good conditions. If the pressure falls it means that there are pores bigger than 0.45 or 0.65 (depending on what membrane was tested) and the filtration is no longer absolute.



Integrity test video tutorial

REGENERATION OF FINAL PES MEMBRANES WITH MEMBRAN UF

(effective for organic soluble contaminants).

- Rinse in the direction of filtration (flush) with pre-filtered cold water with a flow rate 1.5 times higher than the normal filtration flow rate at > 5 psi (0.34 bar) for 5-10 minutes to eliminate any coarse organic residues. This step is fundamental as it reduces the risk of "cooking" proteins or other organic materials (for example, β -glucans) which might occur when washing and rinsing directly with boiling water.
- Flush with pre-filtered water at 125-180 °F (50-80 °C) at 5-30 psi (0.34-2.0 bar) for 15-20 minutes. The warmer the water, the better the results will be, but do not exceed 180 °F (80 °C).
- Caustic wash (flush): dilute Membran UF (AEB caustic detergent) at 1 – 5% solution with water at 125 -140 °F. Dilution will vary depending on water hardness, soil load, temperatures, etc. Recirculate for 15 minutes before returning to hot caustic tank or dispose.
- Hot water rinse (flush) at 75 °C - 165 °F is then circulated for 15 minutes allowing for all the caustic to flow to drain. A conductivity probe is normally inserted within the circuit to ensure that all the caustic has been removed.

- Cold water, filtered to less than 2 microns absolute and exposed to ultraviolet irradiation, is used as a final rinse (flush).

- Systems are often left filled with a proprietary sterilant like X-wash until the next production is scheduled.

This is then flushed through using clean cold water until all traces of sterilant are removed.

- Danmil cartridges can be sanitized using Peracid (Peracetic solution) at 1% for 30 minutes at 95-120°F or 35-50°C.

TEMPERATURE (°C)	Delta pressure (bar)
20	5
45	3.2
60	2.8
70	2.2
82	1.8

Chart 2: Cartridge resistance pressure vs temperature in filtration direction.

Polypropylene pre-filter cartridges:

AEB-Danmil also manufactures polypropylene cartridges to be positioned before the more expensive membranes for protection. They're nominal and come in different porosities.

REGENERATION OF PRE-FILTERS

(Polypropylene) in both directions (flush and back-flush).

When ΔP on the pre-filter reaches 0.5-0,8 bar, it is advisable to proceed with a chemical regeneration utilizing Membrane UF at 1-2% in warm water at 105-120°F/40-50°C and flush the pre filter for 10 minutes. Before regenerating, it is good practice to

first wash with cold and warm water at 120-140°F/50-60°C as described above.

When regeneration is completed, rinse thoroughly with cold water.

Filtering Pads

Danmil pads and modules are designed for the filtration of liquids such as wine, oil, beer, and juices.



DANMIL 110 / 130 STERILIZING FILTRATION WITH REDUCTION OF MICROORGANISMS	
CHARACTERISTICS	APPLICATIONS
High rate of microbiological retention, possible thanks to the narrow-pored structure of the filter media, combined with an electrokinetic potential with adsorption action (charged).	-In sterile cold bottling, in order to improve the shelf life of wines, beer and juices. -As pre-filters upstream of membrane filtration, thanks to the high retention capacity of colloidal components.
DANMIL 50 / 70 FILTRATION WITH REDUCTION OF MICROORGANISMS AND MICROFILTRATION	
CHARACTERISTICS	APPLICATIONS
They allow to reach high levels of clarification for their effective retention capacity of the finest particles and microorganisms.	Storage and bottling of microbiologically stable wines.
DANMIL 30 ROUGH, POLISHING FILTRATION	
CHARACTERISTICS	APPLICATIONS
They have a high volume hollow structure and a high turbidity absorption capacity.	Polishing of the product, be it wine, beer, oil or juices.

Chart 3: Danmil pads categories.

DANMIL DEPTH FILTRATION RANGE				
Sheet	Porosity	Thickness (mm)	Tear resistance in wet state (psi)	Water flow rate delta P at 14.5 psi (l/m ² /min)
DA30 (matches Steril 300 XL)	5-12 micron	3.8	>7.2	350-400
DA50 (matches Steril 500 L)	3-6 micron	3.8	>7.2	200-240
DA70 (matches Steril 700 L)	1.5-3 micron	3.8	>7.2	160-200
DA110 (matches Steril 1100)	0.5-0.8 micron	3.8	>11.6	68-80
DA130 (matches Steril 1400)	0.4 - 0.6 micron	3.9	>7.2	42

Chart 4: Danmil pads porosity, thickness, resistance, and permeability.

• **Pad components**

Danmil depth filter sheets are made of natural, first-choice, and particularly pure materials, and they carry a cationic charge. They are made of cellulose, finely shined broad-leaf and conifer fibers, kieselguhr and perlite at different concentrations.

• **Pads sterilization (optional)**

Danmil pads can be sterilized with hot water or saturated steam at a maximum temperature of 273°F / 134°C. During this phase, it is necessary to slightly loosen the compressed filter pack and make sure that the sterilization of the entire filter system is complete. Final compression should only be performed after the cooling of the filter pack.

• **Direction of use**

Each Danmil sheet consists of:

A rough side, representing the entrance of the filtered product;

A smooth side, representing the exit of the filtered product.

• **Pressure difference**

According to the standard operating

mode, filtration must be halted when the maximum permissible pressure difference of 300 kPa (3 bar) is reached. To work under maximum safety conditions, a pressure difference of 150 kPa (1,5 bar) must not be exceeded during filtration for retention of microorganisms.

• **Disposal handling and storage**

Thanks to their composition, Danmil depth filter sheets are biodegradable. However, requirements of local authorities must be observed depending on the filtered product.

PADS STERILIZATION WITH HOT WATER	
Flow rate must be similar to the one used in operations	
The water must be demineralized and free from impurities	
Temperature	80°C / 176°F
Duration	Half hour after temperature has been reached
Pressure	At least 0.5 bar or 7.2 psi at the outlet

STEAM STERILIZATION	
The steam must be free from impurities	
Temperature	134°C / 273°F
Duration	20 minutes starting from when all the valves are steaming
Wash	50 liters/m ² at 1.5 x the filtration flow rate

Chart 5: Pad sterilization

Danmil Carbon: filter pads for color and flavor adjustments

Powdered activated carbon is widely used in the food and beverage industry for absorption applications. However, it has significant drawbacks relating to the handling of bulk carbon powder, cleaning of the process equipment, as well as time and costs associated with carbon removal from the process.

Danmil Carbon pads address these concerns by incorporating activated carbon within a matrix of cellulosic fibers.

Danmil Carbon pads are available in the format of 400 mm x 400 mm and they are made of cellulose, powdered activated carbon, and diatomaceous earth (DE, Kieselguhr). They have many applications:

- De-chlorination of water
- Correction of color, flavor and odors in distilled spirits
- Decolorization of sweetener and sugar syrups
- Color correction in juice and beer applications
- Gelatin decolorization and deodorization

ADVANTAGES OF CARBON PADS:

- Adsorption efficiency is greater than an equivalent amount of bulk powdered activated carbon;
- Reduction of the overall process time and increase of product yield;
- Better color removal: an internal comparative study using the same carbon grade showed up to 150% higher color removal efficiency when compared to bulk PAC (Powdered Activated Carbon);
- Absence of carbon dust and ease of use thanks to the Carbon-impregnated media;
- Good permeability with excellent filtrate quality
- High economic efficiency due to their long service life

PERLITE FILTRATION EARTHS, PRE-COAT AND BODY FEED

Fibroxcel 10: pre-coat with 10% fibers for gross filtration.

Permeability: 120 l (30 gallons)/m²/minute. Dosage: 0.5-1 kg (1-2.2lb)/m² of filtering area for the formation of the pre-coat or in variable doses between 50 to 500 g/hl (4-40 lb/1,000 gallons) for the body feed filtration.

Fibroxcel 30: pre-coat with 30% fibers for polishing filtration.

Permeability: 50 l (13 gallons)/m²/minute.

Should be used in a variable dose between 0.8 and 1kg (1.7-2.2lb)/m² of filtering surface for building up the pre-coat, 20 and 80 g/hl (1.5-6 lb/1,000 gallons) for the body feed filtration.

Fibroxcel VAC: vacuum filters tend to have an extremely compact layer of earths that eventually breaks or plugs. Fibroxcel VAC, mixed at 10% with the DE used for the filtration, guarantees a smooth cut of the top layer and, thanks to its softening action, delays plugging of the cake and prevents cracks. The drum cut is linear and micrometric, with a noticeable increase in the total filtration capacity and, eventually, a more satisfactory yield. The addition of Fibroxcel Vac makes it possible to treat very quickly suspensions loaded with hazy matter, which would require a great work to discharge coats, with the assurance of an excellent result. Fibroxcel VAC can also be used in conjunction with the body feed in pressure filters for particularly hazy musts and concentrates.

Product Permeability (Darcy)	
FIBROXCEL 30	30
FIBROXCEL 10	65
SILITE MINI SPEED	29
SILITE NORMAL SPEED	69
SILITE HIGH SPEED	11
SILITE HIGH SPEED SP	65

Chart 6: Darcys values for AEB filtering earths

Silite mini speed: this is a very fine perlite, with low flow-speed, used for tight filtrations, especially the polishing ones.

Permeability: l/m²/minute: 68-77, specific weight when wet: 0,21-0,23.

Applications: final filtrations of wines, vinegars, dry spirits, beer, oils, juices, distillates.

Silite normal speed: this perlite has a medium permeability and is recommended for all uncomplicated filtrations. It is used for normal filtrations.

Permeability: l/m²/minute: 127-147, specific weight when wet: 0,20-0,22.

Applications: filtrations of wines, sweet spirits, distillates, fruit juices, syrups, beer, industrial drains, etc.

Silite high speed: the high permeability of this perlite, makes it ideal for filtering very hazy liquids with a high content of suspended solids. It is classified as a perlite for coarse filtrations.

Permeability: l/m²/minute: 200-240, specific weight when wet: 0,16-0,18.

Applications: coarse filtrations of musts, wort, cloudy wines, thick spirits, or syrups.



Fibroxcel pallets at a winery in Italy

CHAPTER TEN

Equipment

Ion Exchange, Stabymatic: a fully integrated ion exchange system used to reduce the pH and to stabilize wine or juice for tartrates. The stabilization works with the concept that subtracting K⁺ from the media means lower formation of K-tartrate crystals. Furthermore, higher H⁺ means lower pH. To stabilize a full tank, most of the time only 20-30% of the wine needs to be treated, lowering the total pH by an average of 0.3, and eliminating tartaric instability. Older-style ion exchange units were plagued by issues relating to high water use, high effluent production, wine quality issues (taints, color, off-characters, and oxidation), mobility and problems with blocking resin columns, resulting in significant loss of efficiency, product volume, and quality. Also, in many cases, old-fashioned columns cannot handle must. AEB has addressed and eliminated all of the above problems in the development of the Stabymatic. For musts, a maximum turbidity of 600 NTUs is acceptable, as long as the solids have a diameter of less than 0.4 mm.



STABYMATIC:		
SIZES	PROCESSING SPEED PER HOUR	ELECTRICITY NEEDED
25	65GAL/H	AIR ONLY
200	528GAL/H	480V THREE PHASE
1000	2600GAL/H	480V THREE PHASE
2000	5200GAL/H	480V THREE PHASE

Reactivateur: Automatic Yeast Rehydration and Acclimation

When rehydrating ADY (active dry yeast), a few simple things can make a huge difference in the quality of the biomass that ultimately is going to ferment the must. Temperatures, timings, aeration, and acclimation are all variables that can influence the success of yeast rehydration. The yeast Reactivateur engineered

by AEB has the capability to optimize this delicate process, guaranteeing the best outcome from the inoculum used.

After the operator sets the amount of yeast to rehydrate, the machine starts by intaking a proportional amount of water. Then the water is brought to the programmed temperature and maintained warm, waiting for the operator to add the yeast. Water and yeast are constantly homogenized and saturated with oxygen through continuous mixing.

Acclimation is then achieved by introducing must incrementally, with intervals programmed in the settings. After the acclimation is finished, the machine can pump the active inoculum into the must tank.



Reactivateur sizes, tank volume, and electricity needed:

- 3-10 Kg of yeast, 85 gallons, 480V Three Phase
- 10-30 Kg of yeast, 237 gallons, 480V Three Phase
- 30-60 Kg of yeast, 528 gallons, 480V Three Phase
- 60 Kg of yeast, 792 gallons, 480V Three Phase

E-Flot: for batch must flotation

Flotation is an alternative, intelligent method for achieving must clarity, by pushing solids against gravity and collecting them in a “cake” at the top of the tank. The clear juice is then racked and separated from the racking valve.

AEB manufactures the E-Flot, a state-of-the-art batch flotation system, to get the job done quickly and economically. The clarification of must using the E-Flot is achieved through the incorporation of an inert gas (Nitrogen) into the solids that make up the turbidity of the liquid. Gelatin products like Gelsol, or vegetable derived proteins like Ve-gel, may also be incorporated by the machine to optimize the process. The gas

combines particles in suspension and makes them float towards the surface of the tank leaving a clear must at the bottom. It is important to first make sure that the must is thoroughly depectinized. AEB recommends the use of enzymes such as Endozym Flotation, Ice, Micro, or Endozym ICS 10 Eclair to help achieve depectinization. In order to have optimal results and better must clarity, it is advisable to use a specific gelatin, like Gelsol, that ensures the formation of a good-sized flocculate that will encompass all the particles to be eliminated.

The benefits of the floatation machine are numerous:

- Saving on power and eliminating the refrigeration and subsequent warm-up time when switching from traditional processing by cold settling.
- Time and tank saving: 50 tons of fruit at 9 am can, in theory, be inoculated by 4 pm on the same day using floatation clarification. This compares to a minimum 24 hrs settling time plus racking, warming, and RDV filtration time.
- The capital cost of a floatation machine is less than one tenth of a similar rated centrifuge.
- E-Flot is a versatile machine that ensures operation at a higher flow rate for gross fining or slower rate for a brighter must.



E-Flot Sizes Processing speed per hour Electricity needed:

E-Flot 5: 1,320 gallons, 220V Three Phase

E-Flot 25: 6,600 gallons, 480V Three Phase

E-Flot 50: 13,200 gallons, 480V Three Phase

E-Flot 80: 21,133 gallons, 480V Three Phase

E-Flot 130: 34,300 gallons, 480V Three Phase

HOW TO PERFORM A PECTIN TEST:

We know that if flotation is unsuccessful the cause most of the times is to be found in the must, not in the equipment. Check if the must is too cold (less than 50°F or 10°C), if the must is fermenting, or if the enzyme did not work (i.e., it did not hydrolyze the pectins). In order to check if the enzyme worked we can ask to the lab to run a pectin test:

- Add 10 ml of ethanol to 5 ml of centrifuged must/wine.
- Let it sit for 60 seconds.
- If floccules appear after one minute, pectins are still present in the wine and they might cause problems with settling.

The test thus performed will frequently give results that are practical enough to understand if the must is de-pectinized. A more accurate procedure requires the ethanol used in the reaction to be acidified. To prepare the "acidified ethanol" solution, pour 250 ml of alcohol into a flask. Add 2.5 ml of hydrochloridric acid to the alcohol and mix gently.

CHAPTER TWELVE

Innotec

Distributed in North America in collaboration with **Collopack**

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Email: Info@Collopack.com | www.collopack.com



We are leaders in the production of cutting-edge equipment and systems in the wine-making and beverage industry: beer, mineral waters, Soft drinks, juices, spirits and beverages.



ABOUT US

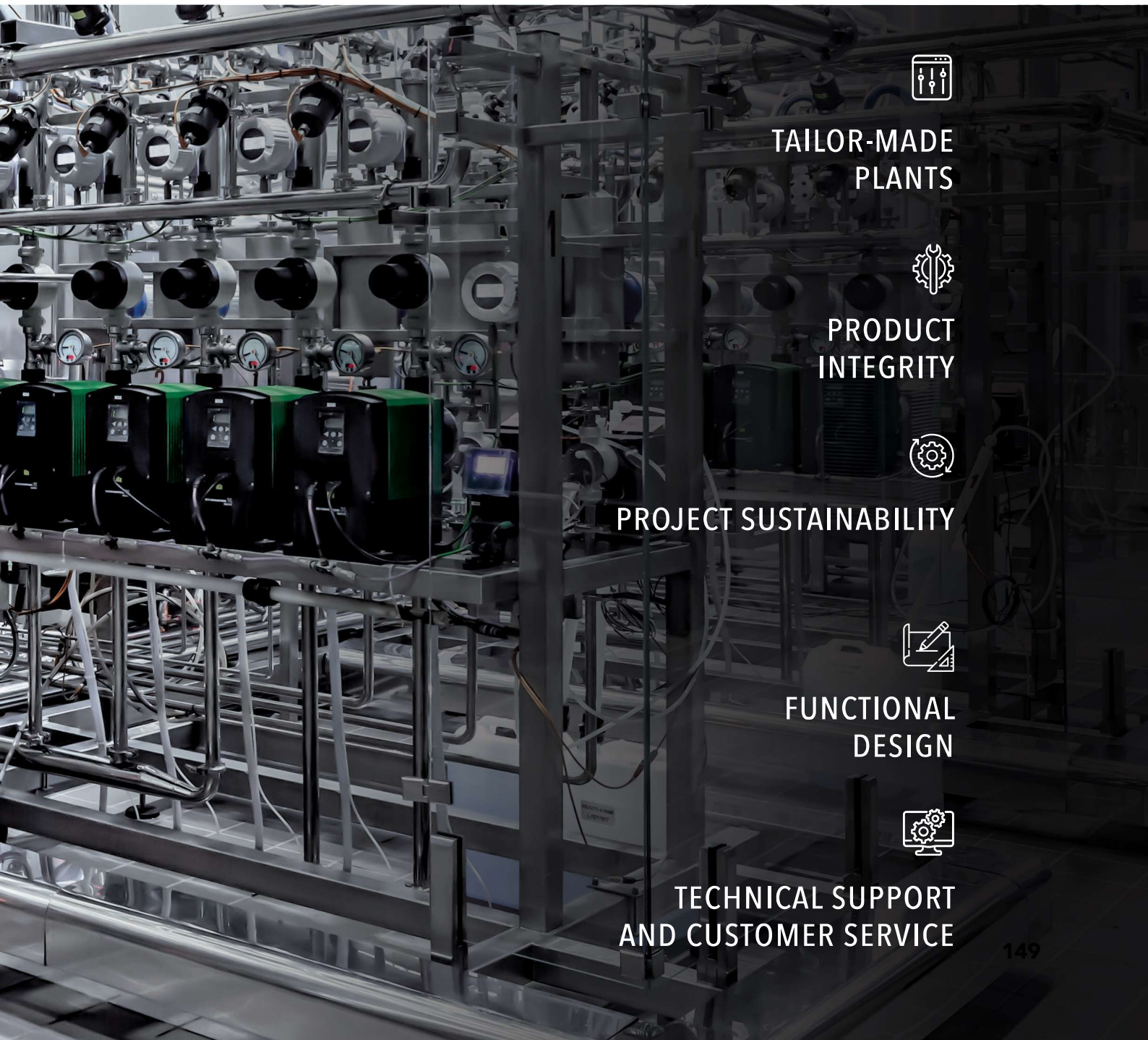
Your partner for high tech solutions.

Pioneers in the manufacture of automated systems for the wine sector, we joined the aeb group in 2017 and have since expanded our focus to the food sector with a team of highly qualified engineers.

INNOTEC WORLD

Twenty Years of Technological Innovation and Design.





TAILOR-MADE
PLANTS



PRODUCT
INTEGRITY



PROJECT SUSTAINABILITY



FUNCTIONAL
DESIGN



TECHNICAL SUPPORT
AND CUSTOMER SERVICE



Specialised Teams and Constant Support.

Our systems are designed by staff that have high levels of expertise. Our mechanical, electronic, chemical and IT engineers, guided by process experts, competently give shape to projects, turning them into real masterpieces of technology tailored to suit the needs of every customer.

Equipment Built to Meet Every Need.

INNOTEC solutions are mainly intended for the food and beverage industry. We produce exclusive systems designed to suit the needs of our customers, according to a tailor-made philosophy.





**Authentic
Sustainability.**

Attention to Resources Starts with Design.



CARBON
FOOTPRINT



RECYCLABLE



RENEWABLE
ENERGY



WATER
RECOVERY

INDUSTRY 4.0

The Added Value of an Automated and Interconnected Production Process.

The sensors and the software of our units can be easily connected with other machinery and with client management systems, allowing complete control and traceability of the process, even remotely.

SIMATIC HMI

SIEMENS

TOUCH

GENERALE IMPIANTO



- TUBO CANTINA P01
- ESP (P103 e Scandi)
- MICROFILTRAZIONE
- REMPLITRICE
- FILTRI HDG/SCIACQ
- RECUPERO PRODOTTO L2B
- POMPA ACIDO
- POMPA PERACETICO

MACROFILTRAZIONE	STAZIONE B	STAZIONE C	SALA DOSAGGI	STAZIONE A	MICRO	REC.PROD.	Macrocycle 1	Macrocycle 2	Macrocycle 3
Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Canale 1: AUTO Canale 2: AUTO Canale 3: AUTO Canale 4: AUTO Canale 5: AUTO	Lavaggio 7i sera vapore L2B con riemp. OFF Lavaggio 7i mattina raffredda e test L2B con riemp. OFF Lavaggio 8i mattina peracetico L1B Solo Filtri OFF		



VINI	1BRIX	2BRIX
SOAVE	5,5	6,5
RECIOTO	9,0	12,0
RIPASSO	6,5	7,5
AMARONE	6,5	7,5

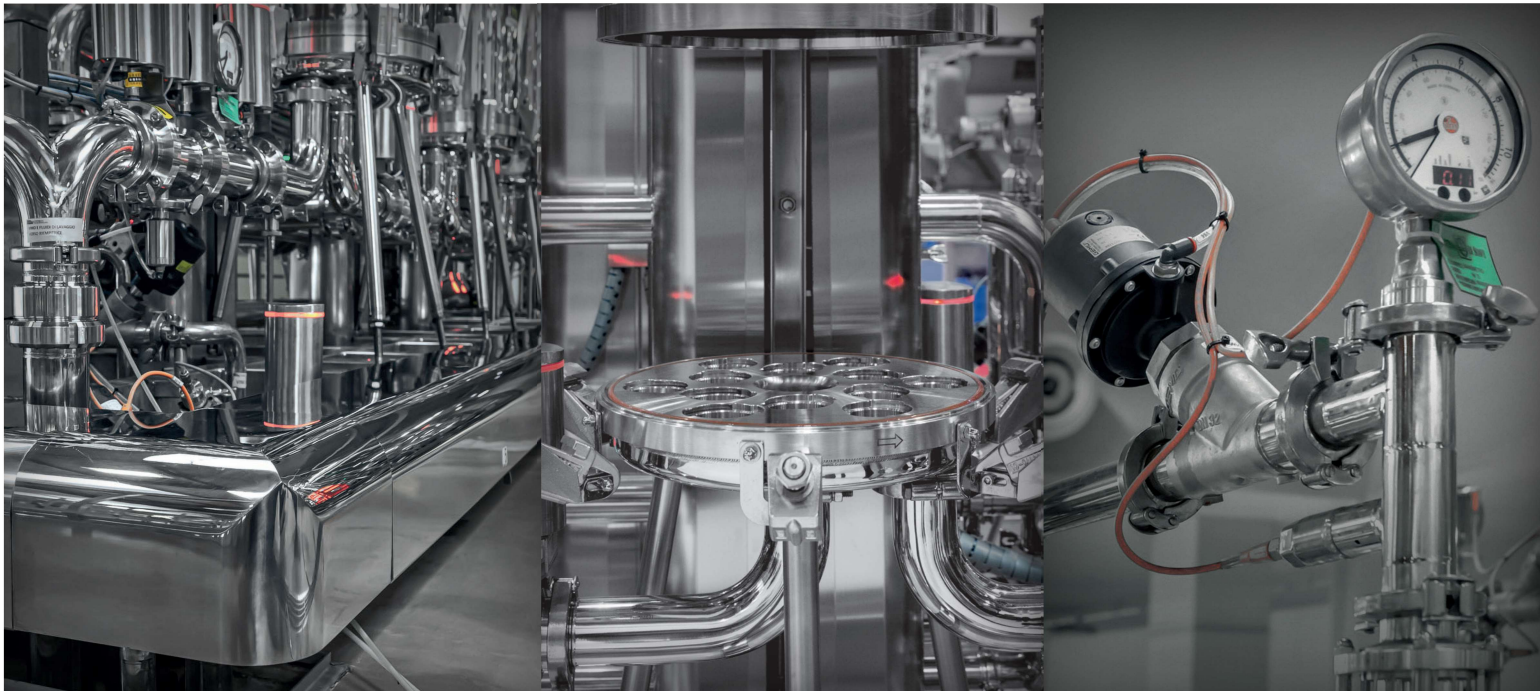
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Micro-Filtration

MICRO-FILTRATION SYSTEMS ALLOW MICROBIOLOGICAL STABILITY TO BE ACHIEVED AT COLD TEMPERATURES WHILE MAINTAINING ORGANOLEPTIC PROPERTIES.

Thanks to filter cartridges, which can be washed and regenerated with the aid of detergent and sanitising products, it is possible to obtain a product that is micro-biologically stable and long-lasting.

We manufacture both manual and automatic micro-filtration systems: the latter are capable of carrying out all work cycles independently.



Enclosed perimeter channel with casing

Housing with chamber lifter

Vent units



FEATURES OF AUTOMATIC SYSTEMS

- Single acting automatic valves.
- Pressure and temperature checks.
- Digital interface and dedicated software.
- Automatic production and washing cycles.
- Automatic integrity test.
- Double counterweight chamber lifter.
- Integrated wiring within the perimeter channel.

FEATURES OF AUTOMATIC PLUS SYSTEMS

- Automatic double acting valves with feedback to position.
- Flow meters.
- Enlarged touch-screen.
- Customisable washing cycles and recipes.
- Full traceability of work and washing cycles.
- Consumption traceability.
- Equipped to communicate with external machines.

C.I.P.

C.I.P. PLANTS (CLEANING IN PLACE) ARE SYSTEMS FOR THE MANAGEMENT OF CLOSED CIRCUIT WASHING PROCESSES AND ARE THE IDEAL CHOICE FOR CLEANING MICRO-FILTRATION SYSTEMS, BOTTLING LINES, STORAGE TANKS, EXCHANGERS AND OTHER TYPES OF FOOD AND WINE EQUIPMENT.

Concentrated detergents and sanitisers are automatically measured out in order to prepare the desired washing solution, which can then be recovered in dedicated tanks by verifying the characteristics of the solution with internal sensors.

The efficiency of our systems is further guaranteed by the possibility of heating the solutions with systems that provide for the recovery of calories. In the automatic systems, the PLC managed processes allow complete traceability of the washing activities.



Arm pulpit

Actuator



FEATURES

- Control of dosing and temperatures.
- Recovery and recirculation of solutions.
- Calorie recovery system.
- Flow control.
- Process traceability.
- Remote technical support.
- Interface with external systems.

DEOX

DEOX IS AN AUTOMATIC SYSTEM THAT ALLOWS IN LINE MONITORING AND THE ELIMINATION OF DISSOLVED OXYGEN AND CARBON DIOXIDE VIA THE PROPORTIONAL DOSAGE OF NITROGEN, THUS ELIMINATING SENSORY AND SHELF-LIFE DEFECTS.

Based on the concentration of O₂ and CO₂, Deox measures out the exact quantity of N₂ necessary - which is added through a microporous membrane - and subsequently stabilises the product inside a tank, where the agglomerated nitrogen with O₂ and CO₂ is released.

Before bottling, the product is analysed in-line with very high precision instruments to guarantee the achievement of the desired parameters set.



Perimeter channel with corner



FEATURES

- Dosing proportional to the flow.
- AISI 316 stainless steel structure.
- Technopolymer microporous membrane for efficient and turbulence-free dosing.
- Adaptation to variable flow rates during bottling.
- Easy washing and sanitising with dedicated line.
- Full process traceability.
- Interface compatibility with C.I.P. and micro-filtration systems.
- Double in-out sensor for differential processing.

CARBOX

CARBOX IS THE AUTOMATIC SYSTEM FOR ADDING CO₂ WITH RELATIVE PROPORTION TO THE PRODUCT FLOW JUST BEFORE BOTTLING TAKES PLACE.

The result is a fine and persistent effervescence, obtained thanks to a technology that prevents the formation of turbulent flows that are responsible for coarse and unpleasant bubbles.

Dosing takes place through a microporous membrane; the exact quantity of CO₂ is calculated automatically. For high-dosing systems, the product is stabilised in an autoclave to ensure complete gas dissolution.

Before bottling, the product is analysed in-line with very high precision instruments to guarantee the achievement of the desired parameters set.



Microporous membrane



FEATURES

- Dosing from 0.5 to 10 g/l of CO₂.
- Dosing proportional to the flow.
- AISI 316 stainless steel structure.
- Microporous membrane in technopolymer.
- Adaptation to variable flow rates during bottling.
- Easy washing and sanitising with dedicated line.
- Full process traceability.
- Interface compatibility with C.I.P. and micro-filtration systems.
- Possibility of integration with cooler.
- Double in-out sensor for differential processing.

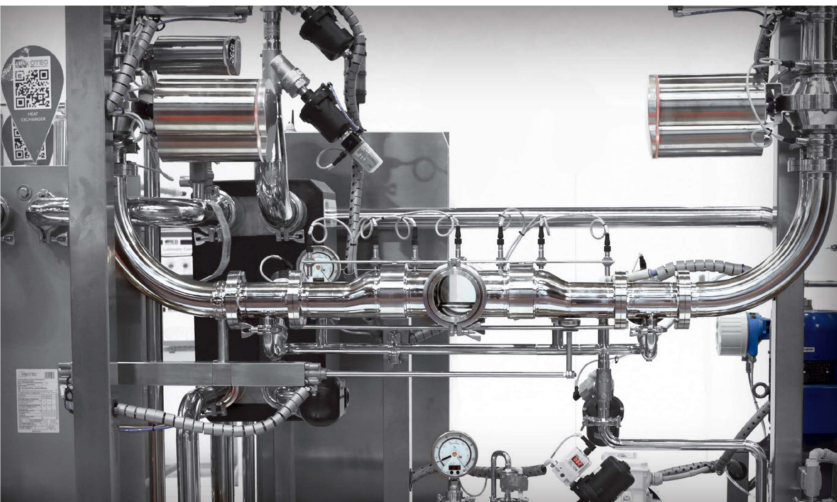
P.D.S.

PIPING DISCHARGE SYSTEMS ALLOW SEPARATING THE DIFFERENT PRODUCTS TO BE TRANSFERRED BY MEANS OF A DIAPHRAGM, PREVENTING THEM FROM MIXING, DRASTICALLY REDUCING PRODUCT LOSSES.

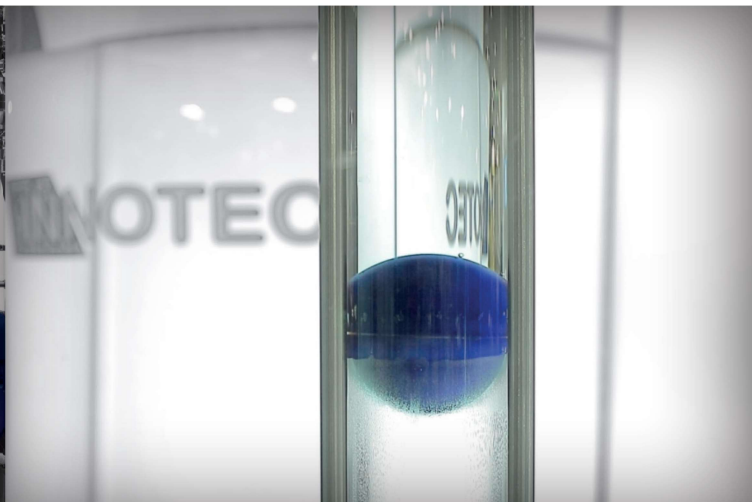
The system is ideal when the distances, both in the production and in the emptying phases, are long. The diaphragm is designed to be detected during its movement and is compatible with all detergent and sanitising solutions that may be used for washing the lines.

The P.D.S. consists of techno-polymer ball which is elastic enough to slide inside a special pipe thanks to the thrust of a gas or of water or wine. The movement is automatic and managed by a central PLC.

In addition to the departure and arrival station, it is also possible to have intermediate stations and the pipe can thermostatically control the product circulating inside it (whether hot and cold), thus optimising filling functions.



P.D.S. parking station



Liquid handling ball



FEATURES

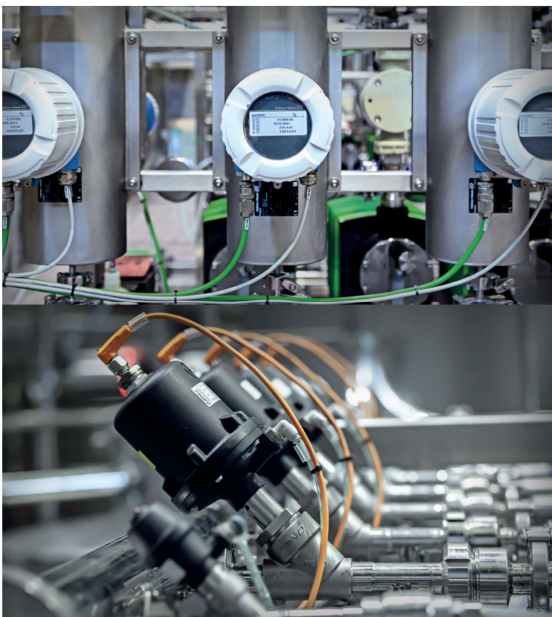
- Dosing from 0.5 to 10 g/l of CO₂.
- Internally polished AISI 316 stainless steel structure.
- Flange connections.
- 3" pipes sectioned by automatic ball valves.
- In-line acclimatisation also for pressure products.
- Real-time ball movement feedback.
- Can be integrated with C.I.P., dosing and micro-filtration systems.
- Better pressure management during filling to prevent the formation of froth.
- Total product recovery.

Dosing Systems

IN-LINE DOSING SYSTEMS ALLOW ADDITIVES AND ADJUVANTS TO BE MEASURED AND DOSED DIRECTLY INTO THE PRODUCT BEFORE IT IS PACKAGED; HIGH PRECISION AND MAXIMUM SAFETY ARE ENSURED BY MONITORING THE LEVELS OF REDUDANT PRODUCTS ADDED DURING ALL PHASES OF THE PROCESS.

The use of cutting-edge sensors guarantees accurate dosing operations.

Large injection dosing units



Dosing injection valves



High flow dosing systems



Low flow dosing systems

FEATURES

- Step by step diaphragm pumps with feedback in case of anomalies.
- Mass flow dosing monitoring sensor.
- Scale that weighs the consumption of the product that has been dosed.
- Can be integrated with C.I.P., micro-filtration and P.D.S. systems.

R.W.S.

A SYSTEM FOR COLLECTING PRODUCT USED FOR RINSING THE PLANT IN PRE-BOTTLING AND OTHER PHASES, THAT, ONCE VERIFIED, CAN BE REDOSED IN LINE AND TOTALLY RECOVERABLE IN THE SAME PRODUCT.

Upon the commencement of a bottling process a certain volume of wine to be bottled is used to push through and rinse pumps, tubes, housings and fillers. Post rinsing this volume of wine is automatically stored in a holding tank.

It is then dosed directly back in line upstream of microfiltration. The dosing system guarantees high precision thanks to the controls managing the pressure of the dosing pumps. In order to guarantee the integrity of the wine, inert gas is used in the holding tank to form a cap.



Washing spray ball



Bottle unloading grid



FEATURES

- Dosing of retentate proportional to the production batch.
- Reduction of oxidative matter.
- Precision dosing to guarantee the integrity of the wine.
- Splitting incoming wine.
- Interface with C.I.P. and micro-filtration systems.
- Full automation of production and washing operations.

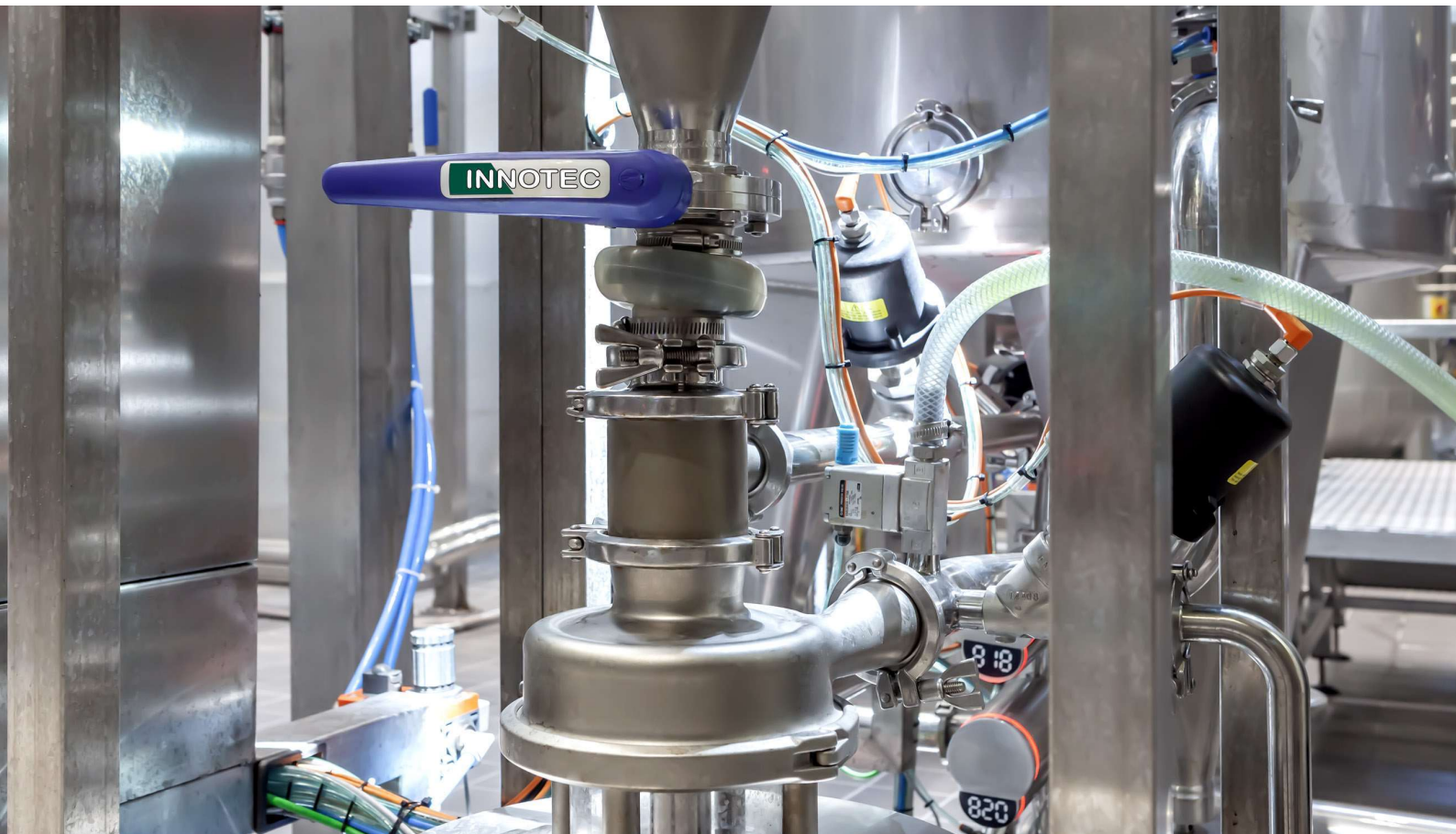
Powder Mixer

AUTOMATIC DISSOLVING SYSTEM THAT ALLOWS SOLUBILISATION OF RAW INGREDIENTS INCLUDING POWDER, GUARANTEEING QUALITY, OPTIMUM SOLUTION HOMOGENISATION AND SAFETY FOR THE OPERATORS.

The induction points of the liquid and powder are separated to prevent a reaction prior to the designated meeting point, which is at the centre of the impeller. Prompt dissolving is ensured thanks to the high speed generated which enables friction to be created between the liquid and powders.

The dissolver limits contact with air, thus reducing the presence of oxygen in the solution to be used. This system does not use the classic marine propeller agitator and combines the powder with the liquid.

Dissolving pump





FEATURES

- Better homogenisation of solutions.
- Speed and safety of work.
- Pumps sized for the specific application.
- Raw material dissolving capacity of 3,000 to 9,000 kgs/h.