



AIRPLAN

CLEANROOM & PROCESS SOLUTIONS
FOR LIFE-SCIENCE

INTEGRAL SOLUTIONS FOR **SEMI-SOLID PRODUCTION LINES**



SEMI-SOLIDPROCESS
PRODUCTION OF CREAMS, LOTIONS & OINTMENTS



THE PROCREAM
CREAM & OINTMENT PROCESS VESSEL
(1,000 LITERS / 264 US GALLONS)



GLOBAL PROVIDER OF **TAILOR-MADE SOLUTIONS**

For more than 50 years, AIRPLAN has been integrating design, engineering, consulting and installation solutions to create turn-key projects focused on meeting the needs of our clients.

The Process Department was created in response to our clients' growing needs for process solutions. Backed by our know-how in the field of industrial turnkey projects, we develop equipment and integrated process lines offering unique features, which are later assembled in our own manufacturing plant.

The Process Department is currently the fastest growing division at AIRPLAN.

SEMISOLIDPROCESS

Production plants for the cosmetics, pharmaceutical, food processing and chemical industries

We conceptualize and design integrated solutions, from vessels for the production of semi-solid products to complementary equipment, such as fuser units and auxiliary tanks.

We develop versatile lines that can be used to prepare pastes, creams and liquids with a viscosity greater than 100,000 mPa·s (cP).

COMMON APPLICATIONS

| | |
|------------------------|--|
| COSMETICS | Creams Sun protection products Lotions Gels Perfumes Shaving cream Shampoo Toothpaste Dye products ... and more |
| PHARMACEUTICALS | Creams Ointments Lotions Gels Suspensions Cleaning agents ... and more |
| FOOD | Sauces Dressings Ketchup Mayonnaise Mustard Baby food Juices Syrups ... and more |

AIRPLAN

THE PROCREAM

CREAM & OINTMENT PROCESS VESSEL
RECIRCULATION AND MIXING SYSTEM



WE TRANSFORM YOUR IDEAS INTO A VIABLE BUSINESS

Know-how

A team of experts in chemical, process, mechanical and electrical engineering will be dedicated to bringing your idea to fruition, engaging in a continuous, dynamic dialogue and sticking to the budget and established deadlines.

Integrated solutions

From initial consulting to the final certification of your equipment, we understand the industry and its regulations, and we guide our clients throughout the entire process. The components of each line are perfectly integrated to ensure smooth operation.

Compliance with international standards

We know and abide by both international standards and the legal framework in each country where our projects are implemented. Our process lines and equipment comply with all applicable directives, such as the European Machinery Directive (2006/42/EC) and the European Pressure Equipment Directive (97/23/EC), standards such as ASME BPE ("Bioprocessing Equipment" certification issued by the American Society of Mechanical Engineers), and regulations including cGMP, ISO14644 and 21 CFR Part 11 (FDA). We have also earned the accreditation required to certify our pressure equipment with the "U" mark, according to the ASME BPVC (Boiler and Pressure Vessel Code).



Flexibility at competitive prices

We guarantee production that is true to the original design and we always strive to provide the best value for every client. Our equipment can be used in various industries and can be easily adapted to different applications. We meet specific needs with specific designs.



Assembly plant at AIRPLAN, Spain, complete with FAT (Factory Acceptance Test) area and quality control



A vessel being packaged for sea transport to America



Orbital welding of pipes

THE PROCREAM

PRODUCTION VESSEL FOR STERILE OPHTHALMIC CREAMS



SEMI-SOLID PROCESSING WITH **RELIABLE RESULTS**

High-tech components

The components of our process lines have been carefully selected to meet our quality standards. We only work with state-of-the-art components from leading industry manufacturers.

Replicable processes

Thanks to the software designed by AIRPLAN, clients can automate recipes, prepare reports and manage data from the control panel interface built into the process line. In addition, it is possible to view critical process variables in real time and adjust the parameters either manually or automatically.

EXAMPLE OF AN INTEGRATED CREAM PRODUCTION VESSEL
Equipment: THE PRO CREAM PREMIUM 1000

Smart design

As the result of a careful study of personnel and product flows, as well as storage needs, our process lines maximize the performance of your production cycles. Our vessels guarantee processes without deadlocks and can be complemented with CIP/SIP (Clean-in-Place / Sterilize-in-Place) systems.



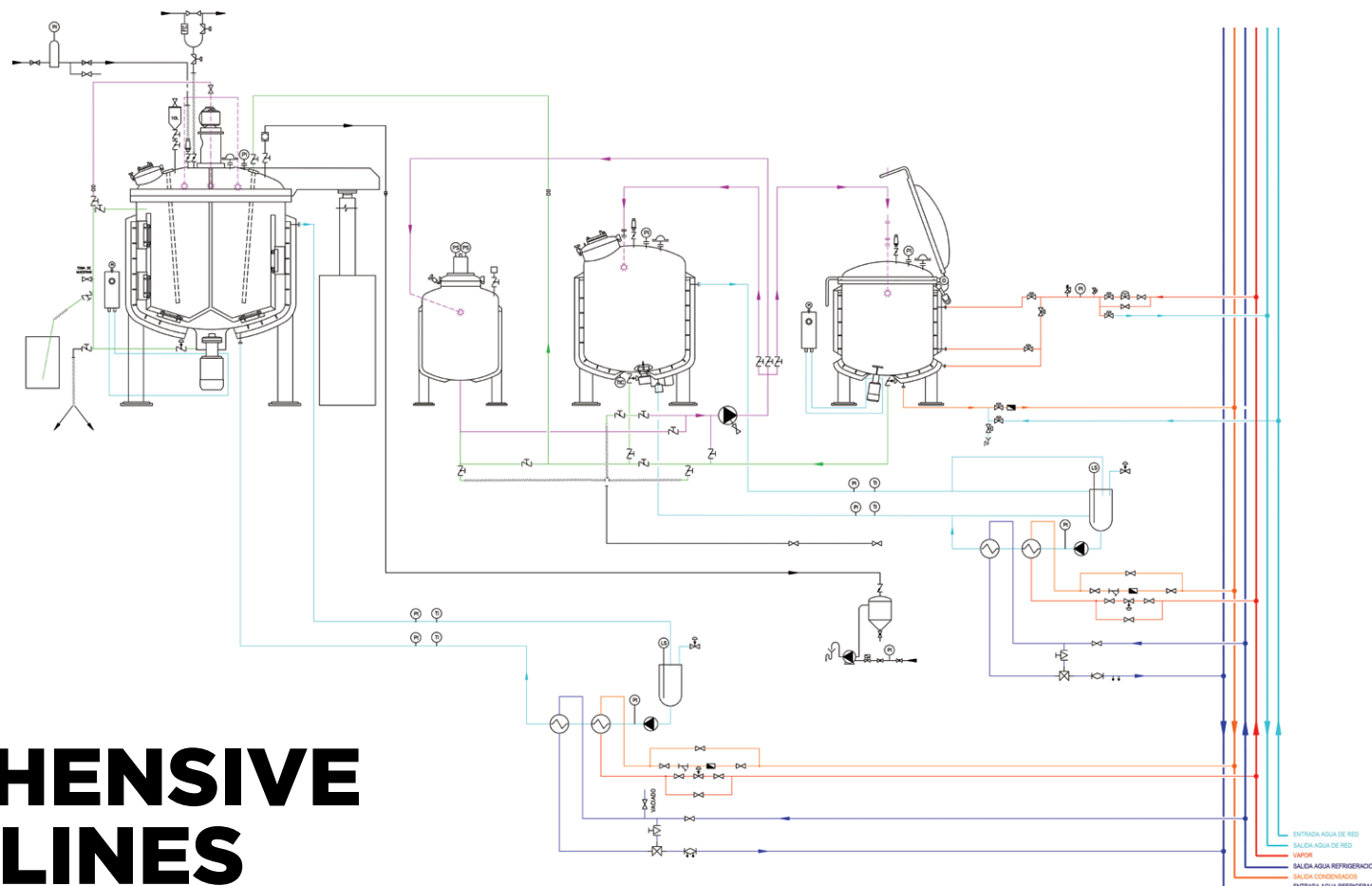
THE **PRO**CREAM

CREAM & OINTMENT PROCESS VESSEL
(250 LITERS / 66 US GALLONS)



EXAMPLE OF A COMPLETE PRODUCTION PLANT FOR COSMETICS

P&ID of a process mixing vessel with melting tank and other auxiliary equipment



MODULE SELECTION FOR COMPREHENSIVE PROCESSING LINES

| POSSIBLE PROCESS PHASES | REQUIRED EQUIPMENT | AIRPLAN EQUIPMENT | PAGES |
|--|--|--|----------|
| Heating and cooling, mixing, homogenization and dispersion, direct addition of additives and built-in CIP cleaning | Vessel for preparing high-performance creams and ointments | THE PRO CREAM PREMIUM | 10 to 13 |
| Heating and cooling, mixing, homogenizing / dispersion | Vessel for preparing conventional creams and ointments | THE PRO CREAM BASIC DUAL THE PRO CREAM BASIC TRIPLE | 14 15 |
| Wax melting or heating of liquid and semi-solid products | Melting tank | THE PRO FUSER | 16 |
| Complementary equipment | Storage, IV solution and syrup tanks, etc. | THE PRO TANK | 16 to 17 |
| Transfer | Transfer unit | THE PRO PUMP | 17 |

THE PROCREAM PREMIUM

OUR HIGH PERFORMANCE VESSEL



This high-end vessel equipped with high-tech components operates with a double stirring and recirculation system for mixing, homogenizing and dispersion. It is self-cleaning, thanks to its built-in CIP system.

I. GENERAL SPECIFICATIONS

| | |
|-----------------|---|
| Material | <p>Interior: All parts in contact with the product are made of AISI 316L stainless steel, finished according to client requirements (standard polishing $Ra \leq 0.8 \mu m$ / $\leq 30 \mu inch$; optional polishing up to $Ra 0.2 \mu m$ / $8 \mu inch$).</p> <p>Exterior: The parts that are not in contact with the product are made from AISI 304L stainless steel.</p> |
| Pressure | <p>The equipment is certified as pressurized equipment according to AD Merkblätter / ASME BPE standards. Our equipment is built according to European Directive 97/23/EC governing pressure equipment and is supplied with the CE mark (PED). We have also earned accreditation that allows us to certify our pressurized equipment with the “U” mark, according to ASME BPVC, at the client’s request.</p> <p>Likewise, our equipment is designed to operate under vacuum conditions.</p> |
| Lid | <p>We optionally include a double piston system to raise the lid, equipped with safety devices and/or hermetic lid seal using eyebolts to work under pressurized conditions.</p> |



II. HEATING AND COOLING SYSTEM

Designs

Heating / cooling:

- ▶ Jacket for heating by means of steam or hot water and for cooling using chilled water.
- ▶ Triple insulating jacket in outer polished stainless steel, fully welded to the main body and filled with rockwool, in compliance with ASME BPE/FDA standards.

Process temperature control

A stand-alone temperature control skid is also available (**THEPROSKIDTHERMO**), a compact unit designed and manufactured at AIRPLAN, with a set of valves that allow for automatic product temperature control inside the vessel. The temperature is controlled via the main touchscreen of the process (IV. Control System).



Example of a cream vessel with a bench-mounted temperature control skid



Stand-alone temperature control skid

III. MIXING SYSTEM

Equipped with a dual stirring system with flow breaker and recirculation.

Top Stirring System

Equipped with an anchor stirrer for better product homogenization and heat transfer, as well as reversible Teflon scrapers and a flow breaker, both with a hygienic design; easy to remove for cleaning.

Bottom Stirring System

The disperser simultaneously permits:

- ▶ Optimal homogenization of different products, with the possibility to add both solid and liquid raw materials, thanks to its great suction capacity.
- ▶ Simultaneous operation as a recirculation pump, thus facilitating the mixture and homogenization of the manufactured products and reducing considerably manufacturing times.
- ▶ Acting as a pump during CIP cleaning processes.

The speed at which the stirrers turn is controlled by a variable-frequency drive (VFD) controller located in the control panel. The bottom of the equipment meets GMP standards and ensures complete emptying, with no remaining product residue.

All stirrers are designed according to ASME BPE sanitary criteria, maintain seal tightness and vacuum conditions under pressure and are CIP/SIP-ready.



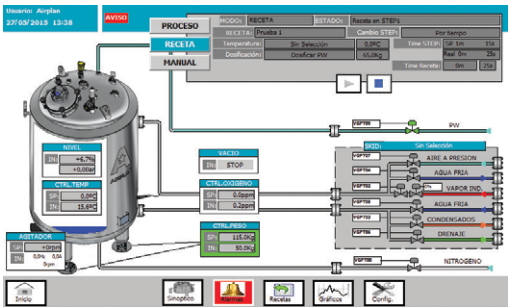
Double mixer system with bottom homogenizing machine and top anchor stirrer with scrapers.

IV. PROCESS CONTROL

| | |
|--|---|
| Control system | Thanks to customized software developed by AIRPLAN, users can automate production recipes, generate reports and manage and record different process variables. The software is programmed and customized for each piece of equipment. |
| Title 21 CFR Part 11 | We also offer optional compliance with regulation Title 21 CFR Part 11, including the specific license. |
| Optional monitoring systems | <ul style="list-style-type: none">▶ Integrated equipment control via a SCADA system▶ Remote control (telecontrol) and maintenance through a VPN router |
| Instrumentation and accessories | The equipment is supplied with all the connections and accessories the client needs. The control panel displays critical process variables in real time and allows parameter adjustments, such as: temperature, pressure/vacuum, product weight, stirring system speed, etc. |
| Optional dosing systems | Optional accessories, such as weighing cells, flow meters, level sensors, etc., can also be included in the vessel. |
| Compliance | Delivered with CE or UL mark. |



The control panel includes customized software for an easy and complete process control



Weighing cell in one of the feet of the vessel, along with its corresponding section in the software program.

V. RECIRCULATION AND CLEANING SYSTEM

| | |
|------------------------------|--|
| Recirculation circuit | The recirculation system permits the homogenization of the product, the suction of additives and cleaning the vessel with a CIP system. The equipment design makes it possible to operate with minimum volumes that are approximately $\geq 20\%$ of the container volume. |
| Unloading material | We ensure that the vessel can be completely emptied during drainage tests, as required by ASME BPE standards. |
| Cleaning system | The vessel is designed for CIP (Clean-in-place) processes that are performed with the aid of the recirculation system, which acts as a pump, and spray balls. As an option, the vessel can be designed to permit later SIP (Sterilization-in-place). |



VI. TECHNICAL SPECIFICATIONS

| THE PRO CREAM PREMIUM MODELS | Minimum useable volume | | Maximum load volume | | Dimensions | | | | | | | | Motor power | |
|---|------------------------|---------|---------------------|---------|------------|-------|-------|--------|-------------------|---------|---------------------|---------|-------------|----------------|
| | | | | | Width | | Depth | | Height (open lid) | | Height (closed lid) | | Homogenizer | Anchor stirrer |
| | liters | US gal. | liters | US gal. | mm | ft-in | mm | ft-in | mm | ft-in | mm | ft-in | kW | kW |
| VCR 0050 | 10 | 2.6 | 50 | 13.2 | 1100 | 3' 7" | 1500 | 4' 11" | 2400 | 7' 10" | 1800 | 5' 10" | 4.0 | 1.1 |
| VCR 0250 | 50 | 13.2 | 250 | 56.8 | 1470 | 5' | 1600 | 5' 3" | 3280 | 10' 9" | 2250 | 7' 5" | 7.5 | 1.5 |
| VCR 0500 | 100 | 22.7 | 500 | 113.5 | 1625 | 5' 4" | 1800 | 5' 10" | 3290 | 11' | 2900 | 9' 6" | 7.5 | 2.2 |
| VCR 1000 | 200 | 45.4 | 1000 | 227.0 | 1630 | 5' 4" | 1630 | 5' 4" | 2900* | 9' 6" | 2900 | 9' 6" | 22 | 4.0 |
| VCR 1500 | 300 | 68.1 | 1500 | 340.5 | 1850 | 6' 1" | 1850 | 6' 1" | 3350* | 10' 12" | 3350 | 10' 12" | 22 | 5.5 |
| VCR 2000 | 400 | 90.8 | 2000 | 454.0 | 1950 | 6' 5" | 1950 | 6' 5" | 3750* | 12' 4" | 3750 | 12' 4" | 45 | 7.5 |

Other sizes upon request.
We reserve the right to change and adapt technical specifications.

* May be equipped with a lid-raising system upon request.

- (1) Bowl
- (2) Bowl lid
- (3) Anchor stirrer
- (4) Homogenizer
- (5) Recirculation and cleaning system
- (6) Control panel
- (7) Inspection window
- (8) Manhole / product inlet
- (9) Lifting column



THE PRO CREAM BASIC

UNIVERSAL TRIPLE STIRRED COUNTER-ROTATING VESSEL

THE PRO CREAM BASIC TRIPLE

| | |
|--------------------|---|
| Description | Vessel especially designed for the production of pharmaceutical and cosmetic creams, liquids and lotions. |
| Mixer | <p>Equipped with a triple mixing system, which operates with different drive systems, making it possible to alter the speed of each agitator independently, according to the processes being performed.</p> <p>Counter-rotating anchor stirrer installed in the bottom:</p> <ul style="list-style-type: none">▶ Slow anchor stirrer with PTFE scrapers that provide optimal homogenization of the product and facilitate heat transfer.▶ Center blades that rotate in the opposite direction of the anchor stirrer. <p>Top agitator installed on the lid:</p> <ul style="list-style-type: none">▶ Fast homogenizer-disperser for the production of emulsions, also with dispersion and shear capacity. |



| | |
|--------------------------|--|
| Vacuum | Operates under vacuum conditions, which enables product loading and prevents air from entering the vessel during the production process. |
| Heating / cooling | Heat or cool the product using steam (hot water) or chilled water that circulates through the double jacket. |
| Capacities | 300, 600, 1200 liters (79, 158 and 317 US gallons). Other volumes available upon request. |
| Cleaning | The vessel is CIP (clean-in-place) system-ready (optional SIP). |

Example of an integral production line for cosmetic products.

Production vessel for cream production with triple mixer (THE PRO CREAM BASIC) and auxiliary tank for preparation and storage with heating/cooling-system (THE PRO TANK).



COMPLEMENTARY EQUIPMENT

The vessels can be complemented with additional equipment, which boost the performance of the cream production process

AUXILIARY VESSELS

THEPROTANK

Description We offer a wide range of fully customizable tanks for different purposes, such as for storage, IV solutions, syrups or cleaning, to complete your cream and ointment manufacturing line.

Benefits

- ▶ Capacity according to client requirements.
- ▶ Adapted to the operating conditions, temperature, pressure and type of product being stored
- ▶ Optional stirring and control systems

The tanks are supplied with CE marking (PED) and upon request with pressure equipment certificate "U", ASME BPVC. The equipment is designed to operate under vacuum conditions, and can optionally be made suitable for explosive atmospheres (EU ATEX).

The inner parts in contact with the product are made of AISI 316L stainless steel, with finishes according to client requirements.

TRANSFER

THEPROPUMP - TRANSFER PUMP

Description Sanitary pumps to transfer liquids, designed for in-situ cleaning (CIP, with SIP available).

Benefits

Compact design. Optional mobile cart for easy moving.
Electric panel with built-in control panel for system control.
May be used as a recirculation pump in CIP systems.



THEPROPREP

Mobile auxiliary vessel for the preparation of solutions - 50 l (13 US gal)



THEPROPREP

Mobile auxiliary vessel - 100 l (26 US gal)



THEPROPUMP

Transfer / CIP pump (mobile option)



THEPROPREP / THEPROTANK

Different auxiliary tank models

SEMISOLID PROCESS LINE
MELTING TANK, LIQUID MIXING TANK
AND PRODUCTION VESSEL



BUFFER SYSTEM

THEPROBUFFER

| | |
|-------------------|---|
| Use | The buffer facilitates the filling process of high viscosity semi-solid products (for example, hyaluronic acid) and works as a lung for the dispenser. It is pressurized to support product delivery and correct dosing. |
| Capacity | According to client requirements. |
| Unloading | To facilitate the manual loading of the product, the equipment has a removable top cover, using a clamp. |
| Cleaning | The buffer can be disassembled at the top and bottom, allowing complete manual cleaning. |
| Advantages | <ul style="list-style-type: none">▸ Adaptable to working conditions, temperature and pressure, and the type of product to contain.▸ Possibility of incorporating temperature control systems and motorized movement in its vertical path.▸ The trolley can have integrated temperature and/or elevation control on request. |



THEPROBUFFER

Buffer developed for a hyaluronic acid production

MELTING TANK

THEPROFUSER

| | |
|-----------------|--|
| Use | Tank prepared for melting and heating waxes or heating liquid and semi-solid products. The heating jacket uses steam or electrical resistance, the equipment being certified as a pressure device. |
| Capacity | According to client requirements. |
| Loading | Equipped with a hinged lid on the top to facilitate the manual loading of products (blocks of wax). |
| Mixer | Maintenance stirrer (designed according to the product to be produced). |
| Cleaning | As an option, the equipment can be designed CIP-ready. |

THE PRO BUFFER and **THE PRO FUSER** are supplied with CE marking (PED) and upon request with pressure equipment certificate "U", ASME BPVC. The equipment is designed to operate under vacuum conditions, and can optionally be made suitable for explosive atmospheres (EU ATEX). The inner parts in contact with the product are made of AISI 316L stainless steel, with finishes according to client requirements.



THEPROFUSER

Melting tank to melt waxes

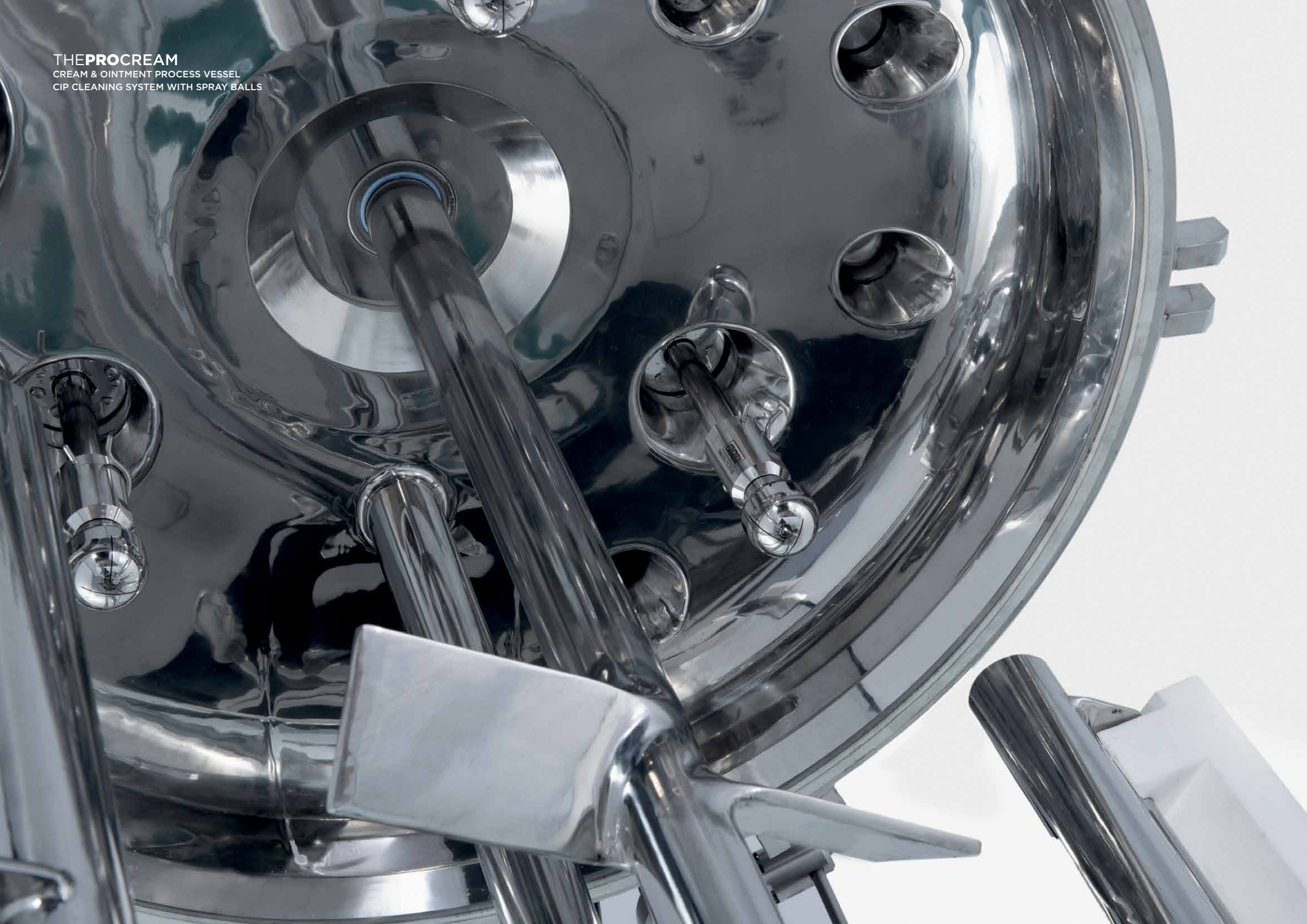


THEPROFUSER

Melting tank to melt waxes with interior view

THE PROCREAM

CREAM & OINTMENT PROCESS VESSEL
CIP CLEANING SYSTEM WITH SPRAY BALLS





YOUR AFTER-SALES SERVICE

AIRPLAN HELPDESK

We offer you our AIRPLAN CARE hotline to help resolve any incident you might have with your process line or equipment, providing a solution over the phone or, if necessary, in person.



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wecare@airplan-sa.com

Maintenance / Spare parts

We offer preventive and corrective maintenance plans, as well as spare part packages.

Ask for more information about our after-sales service!

Training

With our initial training, planned in accordance with your specific needs and concerns, we design a training plan in which we show you how to properly use and maintain your installation and equipment.

We also provide you with a customized maintenance checklist. .

Qualification

Our equipment has passed strict quality controls before leaving the factory. Equipment started up by AIRPLAN personnel is delivered with a detailed report. As a complementary service, AIRPLAN offers the option to prepare and carry out FAT and SAT protocols (Factory / Site Acceptance Tests). We also design and implement IQ and OQ protocols upon client's request.

Documentation

Each process equipment and facility is delivered with its respective *Documentation Dossier*, in digital and paper format. This includes the technical documentation from the component manufacturers, the specific operating manual for the equipment or production line, electric diagrams, certificates and relevant technical diagrams.





More?

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