SPX Flow Technology

Food & Beverage Equipment Overview

SPX®

WHERE IDEAS MEET INDUSTRY

SPX Corporation is a Fortune 500 multi-industry manufacturing leader, headquartered in Charlotte, North Carolina. With 15,000 employees and a presence in 35 countries, we offer highly-specialized engineered solutions to solve critical problems for customers.

SPX is focused on providing solutions that support the expansion of global infrastructure, with particular emphasis on the growing worldwide demand for energy and power. Our innovative product portfolio contains many energy efficient products, including:

- Cooling systems for power plants throughout the world
- Custom engineered flow process equipment for food and beverage manufacturing, oil and gas exploration, distribution and refinement and power generation
- Handheld diagnostic tools for vehicle maintenance and repair
- Power transformers that regulate utility companies' voltage for electrical transmission and distribution

SPX's Flow Technology segment designs, manufactures and markets engineered solutions and products used to process, blend, meter and transport fluids. We also offer equipment for air and gas filtration and dehydration. Our leading brands have global operations which serve the food & beverage, power and energy and industrial markets.

www.spxft.com

Index

SPX Flow Technology Food & Beverage Equipment Overview

Flow Control

Heating and Cooling

Homogenization & Dispersion

Metering

Pumping

Mixing

Process Systems

Food and beverage processing has never been more challenging. Margins are being squeezed, food safety is paramount and consumer demands for new products make formulation changes a regular occurrence.

To meet these challenges head on, you need a partner with a deep understanding of process engineering and a broad portfolio of equipment. Look to SPX and its industry leading brands to provide unparalleled technical support, equipment versatility and food processing expertise.

Recognizing our customers are under pressure to remain competitive, our solutions address key business drivers, such as product flexibility, waste and energy management and regulatory compliance.

Our trusted brands serving the Food & Beverage market include:

anhydro

APV

BRAN+LUEBBE

Gerstenberg Schröder

HANKISON

JOHNSON PUMP

LIGHTNIN

Waukesha Cherry-Burrell

SPX is highly committed to delivering sustainable solutions which exceed customer expectations in value and return through a focus on:

- Waste prevention and loss reduction
- Reuse of resources
- Improved value of raw materials
- Water and energy reduction
- Product safety and security
- Social responsibility

It's hard to find a more comprehensive portfolio of processing equipment anywhere else. Many of our designs incorporate patented features and our research and development efforts continue to produce groundbreaking technologies. When you specify our equipment, you get more than a product – you get a partner. We listen to your goals and design the best solution to help you achieve them. By testing your formulations at one of our many application centers worldwide – you'll have a proven process before you implement it in your plant.

Your partnership with us doesn't end at the sale. Our supportive After-Sales Services include training, consulting, remote diagnostics, repairs and much more. Explore the endless solutions that SPX has to offer. You're sure to find answers that will improve plant performance, increase profitability and enhance the value of your brand.

www.spxft.com

Flow Control

Regulating flow is the basic role that valves play in a processing line. Specifically, they can be used to:

- Open/close or change-over product streams
- Safely separate incompatible media
- Protect against excessive/shortage of pressure
- Sample products from the pipeline

SPX offers two trusted brands of sanitary valves:

- APV
- Waukesha Cherry-Burrell

Across these brands is a wide range of hygienic valves which comprise over 30 different lines. You can choose from simple manual valves to fully automated valves that offer you optimal processing flexibility.

Our valves, including 3.1 certified designs, are made by highly skilled employees in our facilities where lean manufacturing quality standards are practiced. All valves meet the hygienic applications standard and most meet the strict EHEDG and 3A requirements.

Valve sealing materials are all FDA-approved. Crevice-free sealing ensures there is no gap between the seal material and the seal groove where product can get trapped.

Common valve applications include: beer, wine, juice, milk.





The comprehensive valve lines available from SPX are the result of decades of processing experience and continuous innovations. Valves are available in standard and custom designs up to 8 in/200 mm to meet most production capacity needs.

Valve designs and common applications include:

- Manual – product sampling, usually in batch production; wine
- Single seat – product shut off or diversion
- Double seat/mix proof – safe separation of dissimilar liquids

You can count on SPX valves for:

- Gentle product handling – ball-shaped housing
- Optimal cleanability and reduced CIP times – ball-shaped housing, crevice-free sealing
- Reliable performance – stable actuators
- Product safety – specific models adhere to 3A, PMO, CSA, CSN and EHEDG standards
- Reduced down time – spares available for critical situations
- Low inventory needs – common spare parts across models within brands

Waukesha Cherry-Burrell

Valve Manifolds

Manual Valves

MixProof Valves

Single-Seat Valves

Sanitary and BPE Fittings

Butterfly and Ball Valves

Heating and Cooling

Heat exchangers are a core component of many processing lines in the food and beverage industries. Whether you are pasteurizing milk or a high acid product with particulates, SPX has an efficient, durable and economic heat transfer solution for you including plate, tubular, scraped, instant infusion and UHT.

SPX created a unique synergy by bringing together three of the industries' most respected brands of heat exchangers:

- APV
- Gerstenberg Schröder
- Waukesha Cherry-Burrell

Our combined team of heat exchange experts can guide you through our extensive portfolio and help you find the option that is best suited for your production needs.

APV Plate and Tubular Heat Exchangers

Since inventing the plate heat exchanger nearly 90 years ago, APV has continued to develop innovative design features. Today, APV provides a wide range of sanitary plate and tubular heat exchangers used for general heating, cooling and pasteurization of dairy, beverage, brewery and processed food products. With a century of experience and a huge installed base APV heat exchangers are proven designs which make a critical contribution to the efficiency, performance and reliability of customers' processes year after year.

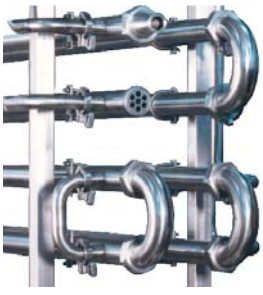
APV Gasketed plate heat exchangers are designed for low to medium viscous products providing operational reliability and efficient heat transfer.

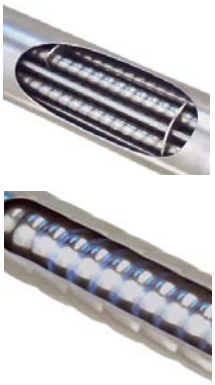
Common applications include: dairy products, egg products, fruit juices and concentrates, beer, tomato products, sauces, infant formula, beer, and many more.

APV

Gasketed Plate Heat Exchangers "Quad-Drive" automated self-closing frame designs

Gasketed Plate Heat Exchangers, sanitary and non-sanitary designs





Tubular Heat Exchangers, double, triple, quadruple and multi-tubes designs





APV tubular heat exchangers are optimized for handling highly-viscous products, products containing pulps and particles, and products sensible to texture changes, par example fruit purees, jams, marmalades, pulpy juices, mashed and diced fruits, and sauces.

Trust APV heat exchangers from SPX for:

- Optimized performance and gentle product treatment
- Uniform product quality and retention of natural aromas and flavors
- Significantly enhanced process efficiency and product output
- Compact and space saving designs
- Modular designs for layout flexibility
- Easy maintenance and serviceability

Scraped Surface Heat Exchangers

SPX covers the full range of Scraped Surface Heat Exchangers (SSHE) from the low pressure to the high pressure ranges. The trusted brands of APV, Gerstenberg Schröder and Waukesha Cherry-Burrell each serve a multitude of applications allowing SPX to meet most any customer demand. We can help you replace your batching operation with continuous, controllable and repeatable processing. Waukesha Cherry-Burrell is a pioneer in SSHE technology. In fact, since the Votator SSHE was invented nearly 90 years ago, this type of heat treatment is often referred to as 'Votating'. Gerstenberg Schröder is recognized as a leading manufacturer of food processing equipment utilizing SSHE technology in specializing in the crystalization of fats and oils.

Common applications include: cheese sauce, butter, margarine, spreads, mayonnaise, dressings, pudding, caramel, deboned meat, pet food, and fruit products.

Rely on SSHE's from SPX for:

- Time savings – easy to maintain and inspect
- Floor space savings – vertical and compact
- Processing flexibility – scraper blades in a wider variety of materials
- Longer seal life – hard faces for durability

Gerstenberg Schröder

High Pressure SSHE Nexus

High Pressure SSHE Kombinator 250S

High Pressure SSHE Perfector 125

Waukesha Cherry-Burrell

Votator® Scraped Surface Heat Exchangers

APV

Scraped Surface Heat Exchangers

Homogenization and Dispersion

Homogenization ensures that a product has the same composition, structure, or character throughout. This process covers a wide range of products and applications such as emulsions, dispersions and cell rupture.

SPX offers an expanded portfolio of dispersion equipment through their prominent brands known around the world for their homogenization and dispersion expertise:

- APV
- Bran+Luebbe
- Waukesha Cherry-Burrell

Our Gaulin and Rannie brands continue to be synonymous with the term 'homogenizer.' Together with the respected Bran+Luebbe's Meganizer, you have access to unparalleled homogenization expertise to help you achieve optimal product quality and consumer satisfaction.

Typical applications include: dairy products, fat substitutes, egg products, dressings, fruit juices/ concentrates and tomato products.

SPX offers a wide range of homogenizer designs including laboratory, pilot plant and production models as well as a full line of homogenizing valves.

APV

Rannie® 110T/
Gaulin® 110T
Homogenizers

Rannie® 24/
Gaulin® 24
Homogenizers

Lab Series
Homogenizers

Rannie® 185Q/
Gaulin® 185Q
Homogenizers

Rannie® 5/
Gaulin® 5
Homogenizers





APV homogenizers will deliver:

- Enhanced texture and taste
- Particle size control and uniformity
- Batch-to-batch consistency
- Viscosity control
- Increased shelf stability
- Food safety – 3A compliant, FDA approved packings available

Our five-year Homogenizer Assurance Program is a testament to the reliability of our Gaulin and Rannie homogenizers. You can rely on your equipment to perform efficiently for years to come.

SPX also offers the versatile Waukesha Cherry-Burrell colloid mills, shear pumps, and mixers for a wide range of food and beverage products. Our patented high-shear mixing technologies produce uniform, stable emulsions and dispersions. Easy to operate, they are ideal for either continuous or batch processes that require circulation.

Common applications include: ricotta cheese, food pastes, tomato sauces, salad dressing, mayonnaise, and liquid egg homogenization.

You can count on Waukesha Cherry-Burrell for:

- Product quality – provides smooth, uniform surface textures
- Product integrity – suspends/disperses to give stable solids in liquid suspension

BRAN+LUEBBE

Meganizer
High Pressure Homogenizer

Waukesha Cherry-Burrell

CR Mixers

Colloid Mills and
Shear Pumps

Metering

Metering in food and beverage manufacturing is defined as controlled liquid ingredient injection. This process involves precise dosing of costly ingredients such as colors, flavors, vitamins and preservatives.

SPX offers you the widest range of metering pumps for practically every situation where liquids have to be metered and blended.

The product range includes:

- Leak-free diaphragm pumps
- Plunger pumps

A metering pump works on a similar principle as a hypodermic needle, in which a plunger draws liquid into and out of a cylinder. In a metering pump, a piston located in the pump head acts as a plunger. As the piston pulls back, it pulls liquid in; as it is pushed forward, it pushes liquid out. Volumes are varied by lengthening or shortening the throw of the piston, and speeding it up or slowing it down.

Metering configurations can be as simple as one-head/one-pump/one piston dosing a color or vitamin or as complex as blending multiple ingredients together. For example, a mayonnaise system might have four pump heads to meter and blend vegetable oil, water, eggs and brine.

Ingredient ratios and flow rates can be automatically adjusted using a PLC touch screen. Recipes can be pre-programmed and easily adjusted to ensure product quality and maximize run times.

Common applications include: confectionery, snack food coatings, jellies, mayonnaise, salad dressings, margarine, yogurt and tomato products.

BRAN+LUEBBE

ProCam Metering Pumps

ProCam Smart Metering Pumps





You can depend on our Bran+Luebbe metering pumps for:

- Flexibility – different dilution ratios and recipes can run on the same pump
- Accuracy – protects against out of spec product, +/- 0.5% due to precise metering gears
- Efficiency – multiple heads can be mechanically coupled together and controlled by flow meters for immediate ingredient availability
- Processing adaptability – pumps can handle a wide range of flow rates, up to 14,500 psi/1000 bar
- Expandability – extra pumps or automation control can easily be added to existing pumps for increased capacity, new formulations
- Control simplicity – one motor runs multiple pump heads
- Minimal hold-up time - reduces loss of costly ingredients that may become trapped in the pump head
- Ease of cleanability – CIP design options, surface roughness down to Ra 0.4
- Optimal sanitation – pumps are hermetically sealed to protect product and work environment
- Food safety – 3A, FDA, and EHEDG compliant

We stand by our products. Our service teams are available to be on site during set-up and can handle important testing and maintenance tasks if required. They can identify and eliminate any sources of errors in advance before breakdowns occur. Corrective maintenance is performed with genuine spares and consumables.

BRAN+LUEBBE

ProCam Sanitary Diaphragm Metering Pumps

ProCam Hygienic Diaphragm Metering Pumps

NOVADOS Metering Pumps

Pumping

Transferring liquid or semi-liquid products from point A to point B is the basic function pumps perform in a food and beverage processing line. The type of pump you choose depends on the characteristics of the product you need to move.

Pump designs and common applications include:

- Circumferential piston – cottage cheese, cream fillings, fruit puree, juice, fats and oils, batters, whey, cheese, eggs
- Centrifugal – beer, wine, soft drinks, light syrups, milk, CIP runs
- Self-priming – CIP solutions, eggs
- Gear – chocolate, cocoa butter, fillers, liquid sugar, vegetable fats and oils, molasses
- Flexible impeller – wine, light syrups, batters
- Rubber rotor – meat, cheese, dough
- Rotary lobe – dough, peanut butter
- Piston and diaphragm – flavors, colors, fats, oils

SPX offers these trusted pump brands:

- APV
- Bran+Luebbe
- Gerstenberg Schröder
- Johnson Pump
- Waukesha Cherry-Burrell

This comprehensive line of pumps is the result of more than a century of processing experience and continuous innovation. Our research, design and application engineers have extensive backgrounds in their respective fields and you can draw on this experience to solve your pumping challenges.

APV

Centrifugal and
Positive Displacement Pumps

BRAN+LUEBBE

3A Quick Release
Pumps

Gerstenberg Schröder

High Pressure
Plunger Pump





You can expect these benefits from SPX food and beverage pumps:

- Labor savings – most models available with CIP capabilities
- Increased hydraulic range – correct pump size for application
- Lower cost of ownership – long life features reduce maintenance costs
- Increased flow rates – without having to change pumps
- Changeability – can switch from COP to CIP design without changing piping or baseplates
- Food safety – most models are 3A, FDA and EHEDG compliant
- Prompt delivery times – minimize downtime during change outs

Ask about our Factory Remanufacturing Program for certain brands that can restore your old pump to new condition. You get the same quality, performance-tested, rugged reliability and factory warranty you wanted when you first bought it – and at a substantial savings over new pump costs. With our convenient Pump Exchange policy, you save additional time and expense because downtime is minimized.

SPX's Factory Inspect and Advise Program also enhances the life of your pump with custom repair or reconditioning after consultation with factory-trained technicians that match your performance and budget needs. Your pump body may be remachined multiple times and retains the factory warranty.

Our Certified Pump Repair Centers also have factory trained and certified service technicians for quick, local response.

JOHNSON PUMP

TopWing Multi-Lobe Rotary Lobe Pumps

TopGear Internal Gear Pumps

Flexible Impeller Pumps

Waukesha Cherry-Burrell

Universal I & II Series Positive Displacement Pumps

Centrifugal Pumps

Mixing

Mixing, stirring and blending of products are fundamental operations in liquid processing. Often a fluid consists of components that are either dissolved or contain a dispersion of particles of different sizes such as milk, which consists of fat, protein, carbohydrates, minerals and water.

Whether you need a standalone mixer or a complete mixing and blending system, SPX offers market-leading brands including:

- APV's Flex-Mix Family
- Bran+Luebbe's PENTAX Line
- LIGHTNIN's SanStar Line
- Waukesha Cherry-Burrell S-Series Mixer Line

While some manufacturers may consider mixing and blending a 'commoditized process', we know that there is a good deal of engineering that goes into finding the right solution. We have more decades of experience and the broadest line of mixing options in the industry to back it up. We help you determine the best solution for your mixing and blending needs to achieve the results you want.

Common applications include: dairy products, orange juice, beer, tomato sauces, salad dressing, margarine and peanut butter.

You can be confident in SPX mixers and blenders for:

- Flexibility – rapid product changeover
- Versatility – recipe changes/new product formulations
- Consistency – predictable production of complex mixtures
- Higher output – advanced technology, precision control
- Increased mixing times – high shear for better dispersion
- Reduced product loss – minimum rejects and waste
- Increased production – easy to clean, low maintenance
- Food safety – comply with 3A, FDA, CE standards
- Ease of operation – designed for operator comfort, safety
- Rapid pay-back – low maintenance results in higher throughput

APV

Continuous Sugar Dissolver

Power

Liquiverter

DAR

TPM

APV Flex-Mix™ Family

Processor

Instant

BRAN+LUEBBE

PENTAX Mixers

PENTAX Hygienic Mixers





But don't take our word for it. At our Process Technology Lab, we'll evaluate your existing mixer design and process goals to determine opportunities for improvement. We'll team with your technical group to reduce the time and expense of developing new mixing applications. Importantly, we have extensive experience in scaling up lab designs and achieving full-scale performance.

You can choose to work with us in three ways:

- Scaled-down tests using your actual product
- Process, material simulation (computational fluid dynamics modeling)
- Full-scale performance tests, on- or off-site

Through our state-of-the-art testing facility, our broad product line, and our highly-qualified network of sales engineers, you're sure to find the mixing option that solves your problem and improves your processes.

Impellers

A510

A340

A320

A315

MBI 410

MBI 205

A312

Lab Scale

LIGHTNIN

SSV Vertical Mixers

BioCIP Top-Entry Mag Drive Mixers

MBI Bottom-Entry MagMixers

SVM Mixers

G-Series Mixers

Stainless Steel ECL Mixers

MiniCIP MagMixer

SR Series Mixer

Waukesha Cherry-Burrell

S-Series Mixers

Compressed Air Systems

Compressed air is a vital energy source and is utilized in multiple operations in food processing facilities. When properly treated, compressed air is regarded as a safe, clean utility as compared to other energy sources. Compressed air provides the energy required for pneumatic conveyers that transport liquids, powders and moisture-sensitive product throughout the plant. It provides power for pneumatically operated tools and equipment that renders meat products, aerates liquids and mixes granular ingredients. It is ultimately used to package, wrap, seal, palletize and label food products prior to storage or shipment.

SPX offers a selection of Hankison brand Refrigerated Compressed Air Dryers and Compressed Air Filtration products for specific needs and capacities. Hankison's drying and filtration systems are energy efficient offering optimal performance adhering to, international standards for compressed air quality.

Technologies:

- Energy Saving Refrigerated Compressed Air Dryers – HES Series 90 to 675 scfm
- Next Generation Compressed Air Filters – NGF Series 20 to1500 scfm

The HES Series Refrigerated Compressed Air Dryers lowers power costs and improves productivity by matching power consumption to compressed air demand. These dryers automatically cycle (on/off) the refrigeration compressor in response to inlet load conditions. As the inlet air load is reduced, the power requirement to dry the air is matched in proportion to demand.

The NGF Series employs technological advancements in filtration materials and design to ensure premium compressed air quality and low operational costs. Filters are tested and rated delivering certifiable performance according to ISO 8573.1: 2009 air quality standards.

HANKISON

Energy Saving Refrigerated Compressed Air Dryers - HES Series 90- to 675 scfm.





The NGF Series provides the perfect balance between high performance filtration and low pressure drop. Patented filter elements (US 7,618,480 B2) maintain low pressure drop and long service life. By minimizing resistance to flow, energy costs are significantly reduced.

Hankison's compressed air treatment solutions are driven by our dedication to the customer.

Our air treatment products will deliver:

- Significantly enhanced process efficiency and product output
- Compact and space saving designs
- Energy efficiency
- Guaranteed performance – equipment assembled and tested before shipment
- Premium air quality – product is tested in accordance to the latest in ISO Air Quality Standards

SPX has built a reputation for manufacturing quality compressed air treatment solutions globally. For over half a century SPX has provided customers in the compressed air industry with the latest technology to produce superior results.

SPX is dedicated to pursue the best solutions in an expanding marketplace to manufacture new products that meet customer's performance, quality and energy savings requirements. We will continue to excel by providing the best service, sales support, and products to bring value to our customers.

Common applications include: Power for process plant equipment, pneumatic operation, packaging to include bottling, wrapping, and labelling, and beverage, dairy and general food production.

HANKISON

NGF Compressed Air Filters

Blending and Deaeration Systems

Blending and deaeration systems ensure uniform mixing of multiple ingredients and increase production by replacing traditional batch processes. Product consistency enhances product quality, improves taste and in some cases, extends shelf-life.

You can tap into the systems expertise that SPX offers through its APV, Bran+Luebbe and Gerstenberg Schröder brands.

Blending systems include:

- Continuous mayonnaise/salad dressing processing
- Ketchup, sauce, and salsa processing
- Jam and jelly blending system
- Yogurt/whole fruit blending system
- Pickle juice blending system

Bran+Luebbe and Gerstenberg Schröder offer continuous mayonnaise and salad dressing processing systems which meet requirements including high capacity, optimization of process control and overall reduction of production costs.

The ketchup, sauce and salsa processing system features manual and programmable computer control for quick and efficient product recipe changeovers.

The jam and jelly blending system replaces batch production, allowing you to process more flavors during seasonal production.

The yogurt/fruit blending system proportions fruit accurately and blends it thoroughly into the yogurt base. Results show that less fruit is required to achieve the same consistency as batch methods.

The inline pickle juice blending system typically blends five to seven pickle juice ingredients on demand and by recipe, eliminating waste associated with batch processing.

BRAN+LUEBBE

Yogurt/Whole Fruit Blending System

Jam and Jelly Blending System

Ketchup, Sauce, and Salsa System

Continuous Mayonnaise/ Salad Dressing System

Pickle Juice Blending System

Gerstenberg Schröder

Emulsifying System ERS





The presence of undesired air and gases in liquid food products frequently leads to deterioration of the physical, chemical and sensory quality of the product.

Deaeration systems from APV include:

- VFNE E-VAP Concentrator - increases total solids in milk, desserts, dairy products
- VFJ/VFN Dearator – efficient deaeration of milk, juice, desserts, fruit fillings, baby food, ketchup, sauces
- Derox Dearator – cold water dearation achieves low oxygen levels in beer and juice
- Derox+Dearator – hot water dearation helps remove contaminants in beer and juice

Common applications include: juices, jams and jellies, diet beverages, alcohol-based beverages, milk, cream, yogurt, desserts, purée, baby food, ketchup and sauces.

Our APV blending and deaeration systems will deliver:

- Flexibility – easy integration with existing lines
- Economic production – low running costs
- Ease of cleanability – fully CIP-able
- Food safety – highest hygiene standards
- Maximum run time – pro-active service agreements (i.e. crack testing) identify and rectify possible faults

APV


Deaerator VFN & VFJ


VFN E-VAP Concentrator

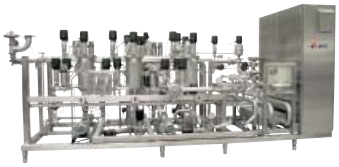

Cold Water Deaerators Derox

HGB System

Carbomaster

Hot Water Deaerators Derox Plus

Multimaster



Thermal Processing Systems

Heat treatment reduces the amount of viable bacteria and spores in food and beverage products. Processes can range from a mild pasteurization to a full sterilization, depending upon the product type and the stage in the manufacturing process.

SPX is a world leader in Ultra High Temperature (UHT) technology with a comprehensive portfolio of tested UHT solutions comprised of plate, tubular, injection, infusion and Scraped Surface Heat Exchangers (SSHE) from these respected brands:

- APV
- Gerstenberg Schröder

Together, they offer you an unmatched range of sanitary UHT and aseptic processing system solutions including:

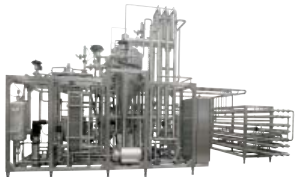
- Skidded pasteurizing systems
- UHT systems
- Extended Shelf Life (ESL) systems
- SpiraTherm system
- Infusion and injection systems
- Tubular and plate components
- High pressure pasteurization

APV

Add-on UHT Systems

Instant Infusion Systems

Multi-purpose UHT Systems



Injection UHT Systems

High-heat Infusion Systems

Plate UHT Systems

SpiraTherm Systems

Infusion Systems





We can help you select the right heating and cooling treatment by carefully evaluating the balance between high bacteriological standards and low destruction of valuable nutrients. This ensures that your thermal processing system will provide fast heating, short and precise holding time at maximum temperatures and fast cooling.

Typical applications include: milk, cream, yogurt, quark products, emulsion, soya milk, baby food, ice cream mix, cheese dips, processed cheese, desserts/puddings, whey protein concentrate, coffee creamer, egg-based products, sauce, soups, coffee/ice tea and fruit juice.

We can test your process at our state-of-the-art Innovation Center. Our UHT pilot plant is capable of product testing, optimizing existing processes and new process development – assuring production scalability.

You can rely on our SPX thermal processing systems for:

- Product quality – UHT systems that are tailored to provide the best quality product
- Reduced maintenance costs – Tubular systems that offer a safe and low maintenance alternative
- Gentle and accurate heating – Unique infusion heating systems that offer the best infusion heating techniques available in the market place
- Long running hours – Spiratherm systems with high product velocity and extended running hours
- Low energy costs – Plate UHT systems that offer the highest possible energy recovery

Gerstenberg Schröder

High Pressure Pasteurizer
Kombinator SHCW

SSHE Consistator MD 250

Kombinator X250

Fats and Oils Systems - Butter and Margarine

SPX with its APV and Gerstenberg Schröder brands is a leading supplier of manufacturing equipment for butter and dairy blends. We have designed and engineered plants worldwide to help our customers produce a wide variety of spreads to meet their market needs.

Consumer demand for products containing less fat, particularly less butter fat, with improved spreadability straight from the refrigerator is on the rise. Consumers are also seeking out low-fat butter with fewer additives and cleaner label profiles.

APV and Gerstenberg Schröder continue to develop innovative new processes to help our customers keep up with these trends toward healthier products.

Some of the benefits you can expect include:

- Maximum production – advanced automation done in-house
- Product quality – low air content in final product
- Ease of cleanability – internal CIP system
- Guaranteed performance – equipment assembled and tested before shipment

Our butter systems include:

- Butter making machines
- Butter blending plants for dairy spreads and low fat butter
- Butter silos
- Bulk packers for butter and edible fats
- Reworkers for butter and fat
- Butter melting plants
- Mixing plants for butter and edible fats
- Butter pumps and In-line mixers
- Low fat butter plants

You can develop and test your application on our upscalable butter pilot plant at our Innovation Center. Our highly flexible plant can deliver several product trials per day, supported by our team of application and process engineers.

Common applications include: butter, butter reworking, butter melting and dairy spreads.

APV

Butter Mixing Plant

Continuous Butter Machine - HCT2

Low Fat Butter Plant

Gerstenberg Schröder

Continuous Butter Making Machine BM 3000

Butter Silo

Butter Reworker

Butter Blend System

Butter Packaging Line

Dynamic Mixer





Margarine, spreads and shortening production

Gerstenberg Schröder delivers systems worldwide for the production of many crystalized products including margarine, spreads and shortening. We can deliver both standard machinery and specially designed machines as well as complete process lines to meet processors' needs. The designs are the result of intensive development and continual refinement, resulting in top quality systems that help our customers manufacture the widest range of products and increase their competitive edge. The primary goal is to design, supply and support solutions that perfectly meet our customers needs – ranging from the standard frame.

Our crystallization systems include:

Various tanks for compounding the emulsion or shortening blends, pasteurization equipment, high pressure pump, scraped surface heat exchanger, pin rotor machine, remelt unit, clean-in-place (CIP) unit and GS Logic automation.

Common applications include: puff pastry margarine, industrial margarine, table margarine, spreads, low fat spreads, and shortening.

After Sales Services:

Factory-trained sales and service representatives continue to assist you during start-up and help train your employees to operate and maintain the machinery. Our knowledgeable food technologists are also ready to assist at any time at your location or ours - all as part of a complete after sales services support program that spans the entire globe.

Gerstenberg Schröder

Perfector 125

High Pressure SSHE Nexus

High Pressure Plunger Pump

Pin Rotor Machine

In-house Shortening Plant

Kombinator 250S

Cheese Systems

SPX offers a comprehensive selection of flexible and cost-effective solutions for a wide variety of cheese types and sizes with varying degrees of moisture content and fat in dry matter.

Our APV brand cheese systems include:

- CurdMaster cheese vat
- SoftCurd cheese vat
- CurdFinishing tank
- FinesSaving tank
- OPD Pre-Press
- SaniPress system including mold filling, emptying and washing
- Rack brining system including filling, emptying and washing of racks
- Brine handling
- CheddarMaster – all belt system
- Cheddar Table
- MozzarellaMaster – dry curd system
- MozzarellaMaster – batch system for soft curd

We also can engineer customized systems based on our experience and wide range of technologies to meet your particular cheese production challenges.

Common applications include: European pressed cheese, speciality cheese, pasta filata, cheddars, fresh cheeses.

You can count on SPX cheese systems for:

- Maximum production – advanced automation done in-house
- Guaranteed performance – equipment assembled and tested before shipment
- Design flexibility – systems customized to particular cheese production requirements

CurdMaster Cheese Vat

OPD Pre-Press

FinesSaving Tank

Mould Fillers

SaniPress





The CheeseMaster line is an automated, standard processing line for manufacturing all variations of European Pressed Cheeses (EPC) including hard-and semi-hard, round and rectangular, round-eyed and irregular-eyed, in sizes from 2.2 to 110 lbs per hour (1 kg to 80 kg) or more.

The CheddarMaster system is widely used for the manufacture of all types of cheddar and dry, salted cheeses. It is available as a tower and all belt system with capacities from 1 to 10 tons per hour.

The MozzarellaMaster is based on the same technology as the CheddarMaster – handles mozzarella or pizza cheese recipes.

The SoftCurd Cottage Cheese line is made for cottage cheese with or without cream. The capacity ranges from 1984 lbs. to 5953 lbs./batch (900 kg to 2700 kg/batch) for dry cottage cheese and approximately 3527 lbs. to 10803 lbs./batch (1600 kg to 4900 kg/batch) for creamed cottage cheese.

The specially-designed Rack filler features filling below water level for gentle treatment of soft, pressed cheeses.

The Brine handling system ensures forward flow of clean, saturated, temperature-adjusted brine, enabling real batch traceability.

The FinesSaving tank recovers and reintroduces cheese fines into the cheese to increase yields.

The OPD Pre-Press offers flexible pre-pressing of all kinds of semi-hard and hard cheese types.

The Mould fillers offer flexible filling solutions for cheeses of various dimensions and shapes with different structures and firmness. They can fill up to 24 cheeses in the same operation.

The highly-flexible SaniPress system is ideal for final pressing of semi-hard and hard cheeses.

APV

Rack Filler

MozzarellaMaster

Brine Filtration

SoftCurd Cottage Cheese Vat

CheddarMaster

Membrane and Microparticulation Systems

Membrane filtration is a pressure driven molecular separation process typically used in an industrial application every time there is a need to separate a fluid into 2 streams in order to preserve the nutritional, biological, and physical properties of the liquid to be filtered.

SPX can deliver this desired outcome with membrane systems from our market-leading APV brand:

- Microbial removal from milk, whey, brine and beverages equivalent to cold sterilization
- Concentration, isolation, and purification of target molecules or families of components in milk, whey and beverages (eg proteins, sugars, salts)
- Concentration, low energy dehydration, reduction of transportation costs
- Demineralization, Desalting
- Cracking (multi-fractionation)

Common applications for membrane filtration include: market milk, cheesemaking (protein standardization, casein standardization, cheese concentration), whey treatment, yogurts, biotechnologies, food applications, pharmaceutical applications, and water treatment.

These processes can be designed as standalone units, automated systems delivering optimal control and performance, and complete inline systems featuring pre-and post-treatment for integration into new and existing process lines.

The APV LeanCreme™ Process

The APV LeanCreme™ process, based on the APV Shear Agglomerator (ASA), is a groundbreaking technology that boosts protein functionality in whey and answers rising consumer demand for low fat, highly functional foods. The synergy between heat and shear binds and traps water so that protein links to other molecules and functions like fat globules without the calories. This makes it the ideal starting ingredient for a wide array of innovative and proprietary low fat recipes.

Common applications include: low fat cheeses, full fat cheeses, fermented milk products, desserts, dressings, yogurt drinks, ice creams and spreads, protein shakes, confectionary, bakery, meat productions

APV

APV LeanCreme Systems

NF Systems

UF Systems

MF Systems

RO Systems





Distillation Systems

DISTILLATION

Today, distillation is a widely used operation in the beverage and pharmaceutical industries. Distillation is typically used to separate two or more liquid components when one component is more volatile than the other. The process utilizes the difference of the vapor pressures to produce the separation.

It is important not only for developing new products, but also for recovering and reusing volatile liquids. For example, pharmaceutical manufacturers use large quantities of solvents, most of which can be recovered by distillation with substantial savings in cost and pollution reduction.

Common applications include: separation of water and alcohol, essence recovery from fruits, aroma recovery from coffee, and solvent recovery from extracts and flavors.

Rely on our SPX distillation systems for:

- Gentle product handling – vacuum distillation protects heat sensitive products
- Easy installation – modular design available
- Energy savings – many options for heat recovery
- Process assurance – lab distillation testing available

Many distillation systems are suitable for modular construction. The main advantage is that most of the assembly of equipment and piping is carried out in the factory. This is far more efficient and generally much more economical than field construction. Also, modular construction results in much shorter installation times on site.

APV


Essence Recovery Unit


Batch Distillation System


Alcohol Recover System


Modular Distillation System

Evaporation Systems

EVAPORATION

Evaporation is used to separate a liquid from a solid.

Common applications include: milk, juice, purees, meat and vegetable broths, coffee extract, sugar, corn syrup, de-alcoholized beer, baby food, whey, coffee, ingredients, flavors, starch and sweeteners, plant-based proteins, and animal proteins.

APV and Anhydro evaporators from SPX are available in the following designs:

- Rising/falling film
- Falling film
- Forced circulation
- Flash evaporators
- Tubular falling film
- MVR falling film tubular evaporator
- TVR evaporator
- Sweetened condensed milk evaporator
- Flash Cooler

You can count on our evaporators for:

- Energy savings – designs reuse heat captured from boiling process
- Gentle product handling – vacuum evaporation lowers boiling temperatures
- Flexibility – vary design/capacity by changing plate arrangements
- Expandability – by adding plates or additional effects
- Space savings – low headroom requirement
- Low installation cost – no special foundation needed
- Process assurance – rental units available for trials

Sweetened Condensed Milk

Processing lines for production of Sweetened Condensed Milk based on fresh milk or recombined milk.

APV anhydro

Rising/Falling Film Evaporator

Falling Film Evaporator

MVR Falling Film Tubular Evaporator

TVR Evaporator

Sweetened Condensed Milk Evaporator





APV FX Systems™

Factory Xpress Systems

FX Systems™ - also known as Factory Xpress Systems - are pre-engineered, self-contained skidded systems with short delivery times for rapid implementation in the factory. Including a range of process technologies and applications with comprehensive automation options, FX Systems™ offer rapid installation of processing solutions with the same quality advantages as large processing plants.

SPX Flow Technology engineers have used experience gathered all over the world to design standardized modular solutions combining state-of-the-art technology in skid mounted designs.

Quicker and cheaper installation

FX Systems™ can be customized to a certain extent by choosing between various modules and options, depending on the application type. The standardised module design and short delivery times of as little as a few weeks result in reduced time-to market for a new product and relieve larger plants from time consuming changeovers. Each module contains a full set of installation instructions and can be assembled quickly, thus cutting installation costs to a minimum and significantly shortening time-to-production.

APV

Flex-Mix Instant

SepStream UF

CIP Mini

DELTA Manifold

Drying Systems

Spray drying is a continuous process that converts almost any pumpable liquid into a free-flowing powder. In fact, the process can be found in all areas in the food, dairy and beverage industries.

SPX offers a selection of Anhydro standard spray dryers as well as custom made dryers for specific products and capacities. The drying systems are energy efficient and flexible so a variety of products with different powder functionalities can be produced on the same drying plant.

Dryer types include:

- Fluid bed
- Spin flash
- Spray
- Triple A
- Two-stage conical spray dryer
- Rewet agglomerator

All dryers have a capacity range from a few hundred kg/h to 15,000 kg/h. Some of the special dryers such as the rewet agglomerator might have a narrower range.

A number of components connected to the dryers can optimize the quality and functionality of the final product. Components include:

Dehumidification systems, energy recovery, heating systems including indirect gas or oil, air distribution, centrifugal or nozzle atomizers, chamber shapes, cyclones, filters, internal and external fluid beds, crystallization belt, rewet agglomerator, licithination systems, recovery solution, fines return and product heat treatment systems, high pressure pumps, homogenizers and CIP systems.

anhydro

2 Stage Conical Spray Dryer

Fluid Bed Dryers

Top of Triple A Spray Dryer





The food industry demands plant solutions for long term competitive leadership and profitability.

SPX dryers deliver:

- Superior product qualities
- Reduce deposits for longer running time
- High yields at the lowest possible cost
- Low energy consumption
- Low powder losses in exhaust air
- CIP cleaning for reduced downtime
- Constant product quality and uniformity with consistent powder moisture content and particle size distribution
- Flexible production and quick product change over with minimal product loss
- The ability to utilize the same plant for a number of different applications
- Traceability and compliance with food regulations
- New product development with short time to market

SPX can assist you in designing complete drying plant solutions and optimizing process parameters as well as plant maintenance and spare parts services.

anhydro

Spin Flash Dryer

Triple A Dryer with integrated fluid bed and external fluid bed

Bottom part of the CIP cleanable back house filter and conical part of the dryer (left)

SPX
WHERE IDEAS MEET INDUSTRY

Packaged Process Solutions

GENERAL PROCESSING

SPX's General Processing Technology capabilities link our broad portfolio of technologies together in a wide variety of processing lines. We pool our expertise in flow control, heating and cooling, homogenization and dispersion, metering, pumping, drying, mixing and systems to create a solution tailored to your needs.

Designed for maximum efficiency, these solutions include:

- Reception of raw materials
- Pre-treatment prior to additional processing
- Tank sections
- Output of final end products
- Cleaning of processing lines

We design our systems to help you meet your goals for reducing energy consumption and waste in your process facility. And you can be assured that your product will meet applicable safety standards.

APV

Reception Line

Tank Sections

CIP Unit

BEVERAGE

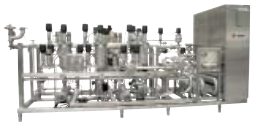
SPX has a long tenure in the beverage industry and a wealth of knowledge in producing a wide variety of products. In fact, many of today's global brands are produced on SPX equipment.

Whether you're making juice, syrup concentrates, engineered waters, RTD teas, or other carbonated and non-carbonated soft drinks – we have a solution for you.

Additionally, we're helping our customers meet the increasing demand for healthier beverages with dairy-free analogues such as soy milk. Using dairy-free alternatives as a raw material creates opportunities to develop a wide range of value-added products with high profit margins.

You can choose a system comprised of components designed specifically to operate together for optimum performance or we can design a stand-alone system to integrate into your current operation.

APV



MultiMaster

Sugar Dissolver

CarboMaster

BrixMaster

Soymilk Plant





BREWERY

Our in-depth knowledge and active involvement in the brewery industry worldwide make us your ideal partner for your brewing operation.

From complete systems and process components, to cost-effective improvements for existing production lines, you can count on us to help you meet your processing goals.

Our unit systems include:

- Wort cooling
- Aeration and yeast dosing
- Yeast propagation
- Beer pasteuization
- Carbonization
- Nitrogenation
- Water deaeration
- High gravity brewing
- Evaporation and distillation
- De-alcoholization

FRESH DAIRY PRODUCTS

Manufacturing fresh dairy products involves mix preparation, flavor dosing and mixing, smoothing, and heat treatment. SPX offers equipment for each step in the manufacturing process. Together with our expertise in this product category, we'll help you produce fresh dairy products with the texture and consistency your customers expect.

The APV Cheasly FC allows dairies to use the same process line to produce a full range of fresh cheeses, quark, yogurt and desserts. The system will help you achieve major manufacturing benefits including a lower capital investment, flexibility for easy line extensions and new formulations, reduced operating costs, and product consistency.

APV


WortMaster


BlendMaster


HGB Master


PU Pasteurizer


Dealcoholization Plant

APV


Flex-Mix Liquiverter


Gasketed Plate Heat Exchanger


Homogenizer


Darmix


Scraped Surface Heat Exchanger

Baby Food Processing

SPX technology is used in baby food processing from raw materials via mixing, pre-processing, evaporation, drying and powder handling.

Key Components:

- Raw materials handling, formulation and mixing systems
- Pasteurization, homogenization and cooling
- Pre-heat treatment and evaporation
- Spray drying, powder handling and packing
- Control system, traceability and validation
- CIP cleaning
- Capacities: from 300 to 15,000 kg/h powder
- Flexibilities: numerous products on same plant
- Energy recovery systems

SPX unique spray dryers for the baby food industry:

- Tall form dryers for standard baby food products
- Three-stage conical spray dryers for flexible production of both non-agglomerated and agglomerated products with excellent instant properties
- Triple A dryers for dustless agglomerated powders with narrow particle size distribution
- Rewet agglomerator for upgrading existing plants to produce agglomerated products
- Integrated automated process solutions

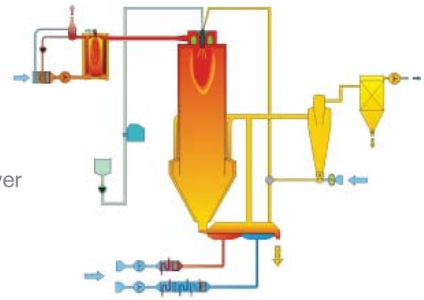
Special products and products of the future:

- Products with new nutritional composition
- Special nutritional products for adolescents, pregnant and breast-feeding women, elderly people and convalescents.

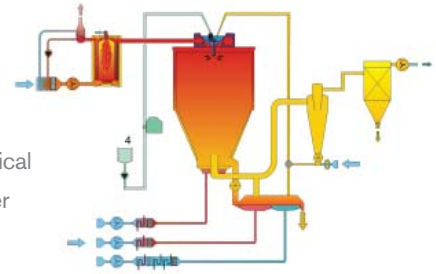
anhydro

Triple A Spray Dryer

Tall Form Dryer



3 Stage Conical Spray Dryer







Whey Processing

SPX is a leader in supplying processing lines to produce top quality whey products.

Products:

- Permeate products including native or virgin permeate and non-caking permeate powder
- Whey products and hydrolyzed whey products
- WPC products from WPC 30 to WPI including micro-particulated and agglomerated WPC
- Demineralized whey and permeate products at different levels of demineralization
- Fat- and/or protein-filled whey and permeate products
- Lactose and mother liquor
- Powders from acid whey

Processes:

- Basic processes including clarification, separation including fat and protein standardization and membrane filtration processes
- Demineralization processes
- Hydrolization
- Evaporation/paraflash evaporation for very high concentration degree
- Crystallization
- Drying
- Heat treatment system for WPC products
- One- or two-stage flash coolers for optimal energy consumption and crystallization process

anhydro

Crystallization Belt and Fluid Bed Dryer

MVR Evaporator on a Whey Plant

Crystallization Belt

Pilot Plants

SPX offers a wide range of sophisticated small scale plants designed for scientific test work, R&D and/or small scale production. The main criteria for all plant designs include flexibility, safety and upscalability.

SPX pilot plants integrates high quality components that are designed to work together to deliver lower investment costs, high performance, reliability, long service life and within a shorter payback time. They are designed with a high degree of standardisation, delivered pre-assembled and factory tested, giving high performance, low risk and very short installation and commissioning times at the customer's site.

SPX Flow Technology Pilot Plants include:

- Spray Drying systems
- Evaporators
- Spin Flash Dryers
- Fluid Bed Dryers
- Dosing units
- Air heaters
- Atomizers
- CIP bag-filters
- Membrane filtration systems
- UHT sterilization units
- Pasteurization plants
- Buttermaking systems
- Mixing and blending systems
- Deaeration Units
- Specific food processing systems
- Scraped Surface Heat Exchangers (SSHE)
- Margarine systems

anhydro

MicraSpray 150 cc

Spin Flash Dryer 51

MicraSpray 35

MicraSpray 400

APV

LeanCreme processing plant

Multi-purpose UHT plant

Gerstenberg Schröder

Nexus Pilot Plant





SPX Innovation Centers

SPX Innovation Centers leverage the extensive industry experience and expertise of a staff of food technologists, process and production engineers together with knowledge gained over many years throughout the company to contribute actively to all types of development, testing and application of SPX branded equipment, systems and processing lines. All facilities and services are designed to provide added value by minimizing waste and energy requirements, or by converting commodity ingredients into new, competitive products.

Innovation center offerings:

- Test and development of new equipment and recipes
- Process validation and concepts
- Test of high-risk projects prior to order
- Comparison of processes
- Optimization of existing products and processes
- Performance testing of pumps, valves and other products
- Prototype assembly and evaluation
- Customer facility on-site testing with rented pilot plant or equipment

Fully equipped laboratories to support test needs:

- Microbiological quality
- Chemical analysis
- Water analysis
- Functional analysis
- Application and process information
- Analysis of a wide range of characteristics and properties related to evaporation and drying
- Functional analysis

SPX Food & Beverage test facilities:

- Silkeborg, Denmark
- Soeborg, Denmark
- Delavan, Wisconsin USA
- Rochester, NY USA
- Xidu, China








Let SPX Flow Technology help you meet your modern challenges of food and beverage processing.
Visit us on the web at www.spxft.com.





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For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.spxft.com.

SPX Corporation reserves the right to incorporate our latest design and material changes without notice or obligation.
Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing.

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