APV
AN SPX BRAND

Mixing and blending technology

SPX

Mixing

Specialist mixing and blending systems for a wide variety of industries and processes

Stirring, mixing, and blending of products are fundamental operations in liquid processing, for example in the dairy, food, beverage and cosmetics industries. Often a fluid consists of components that are either dissolved, or contain a dispersion of particles of different sizes. A good example of a product consisting of a mixture of dispersed components is milk, which consists of fat, protein, carbohydrates, minerals, and water.

The fastest way of achieving dispersion is to use a mechanical shear force.

Mixing and blending is an APV core technology. APV offers complete mixing and blending systems, including fluid agitators, batch and continuous mixers to blenders, for the processed food, beverage, dairy, healthcare, oil, chemical and water treatment industries. The Flex-Mix family includes a range of various mixers as presented below.

Flex-Mix liquiverter

Mixing of liquid/liquid, liquid/powder and liquid/particulates

Specifications	
Field of application	Milk, juices, desserts, pulp, purée, fruit fillings and preserves, baby food, dairy products, ketchup, sauces
Description	Manual unit designed for batch mixing, inline mixing over one or more hydration tanks, or continuous mixing, with optional integration in fully automated production. Available as standard unit or with a high-shear mixing option
Standard sizes/ capacity	Available with different mixer heads and tank sizes of: 250, 500, 1,000, 2,000 and 3,000 l (65, 130, 260, 530, 800 U.S. g)
Temperature profile/ range	-10 - 110°C (14 - 22 PSI)
Pressure	0 - 0.5 bar

Advantages

- Simple but versatile
- Flexibility at low CAPEX
- Large dissolution capacity due to free vortex and square shape
- Fully drainable for improved hygine and minimum waste
- Direct drive reduces spare parts wear
- Flushed double mechanical shaft seal availale in mateiral of customer's choice, depending on application
- Easy to maintain

Flex-Mix instant

Vacuum mixing for recombination and high shear emulsification

Advantages

- Unique high shear mixing enables a high powder intake
- Air is efficiently removed during mixing prolonging running time and ensuring consistent quality
- Allows a closed, continuous production, resulting in higher throughput and reduce dust issues
- Handles a large number of formulations - flexible

Specifications	
Field of application	Milk, juices, desserts, purée, baby food, dairy products, sauces
Description	Designed for batch mixing, inline mixing over one or more hydration tanks or continuous mixing in closed systems with vacuum powder transport
Standard sizes/ capacity	Available with different mixer heads tank sizes of: 500, 1,000, 2,000 and 3,000 l (130, 260, 530, 800 U.S. g). Powder capacity up to 20,000 kg/h (40,000 lbs/h) depending on powder type
Temperature profile/ range	-10 - 110°C (15 - 210°F)
Pressure	-1.0 - 0.5 barg (0 - 22 psi)

Flex-Mix processor

Multi-flexible mixing and processing system for formulated and complex products

Advantages

- Gentle agitation, internal circulation
- High shear mixing for emulsification
- Handles paticulate inclusion
- Heating via jacket or direct steam injection
- Closed system with vacuum/flash options
- Quick batch preparation (flip-flop)

Specifications	
Field of application	Particulated liquid food, fruit fillings and preserves, candy and confectionery, baby food, soups, ketchup, mayonnaise, dressings, processed cheese, cream cheese, cheese spreads, desserts, creams, lotions, gels
Description	Sanitary batch process with processing and cooling in a time frame similar to that of a continuous process. Special mixing agitator design for gentle processing and protection of product integrity. Optional high shear mixing unit for emulsification. Individual process step combinations
Standard sizes/ capacity	250, 500, 1,000, 2,000 and 3,000 (65, 130, 260, 530, 800, 1,300 U.S. g)
Temperature profile/ range	-10 - 110°C (15 - 210°F) (143°C pressure vessels only) (289°F)
Pressure	-1 - 0.5 barg (0 - 22 psi) (3 barg for pressure vessels only) (60 psi)

Power-Mixer

Aseptic in-line mixer designed for liquid/liquid and liquid/gas dispersion technology

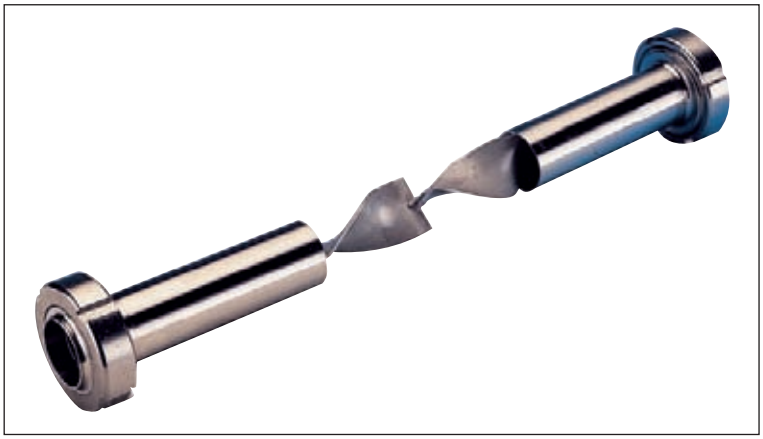
Advantages

- Aseptic aeration
- Emulsification
- Continuous mixing
- PLC standard in all aseptic systems
- Operator-friendly, smooth and trouble-free operation
- Pre-assembled and factory-tested

Specifications	
Field of application	Desserts, butter spreads, pulp, purée, fruit fillings and preserves, candy and confectionery, baby food, dairy products, mayonnaise, dressings, cheese spreads, emulsions, creams, lotions, gels
Description	High shear, stand-alone, in-line mixer, suitable for processing liquid/liquid and liquid/gas dispersions. Optional aseptic mixing
Standard sizes/ capacity	PM750 250 - 1,100 kg/h (550 - 2,400 lbs/h) PM1150 600 - 2,100 kg/h (1,320 - 4,600 lbs/h) PM1550 750 - 3,100 kg/h (1,650 - 6,800 lbs/h) PM2250 2,500 - 5,100 kg/h (5,500 - 11,200 lbs/h)
Temperature profile/ range	-10 - 150°C (14 - 300°F)

Mixer - TPX

An inline static mixer



Specifications	
Field of application	Designed for blending of liquids with a max. viscosity of approx. 20 cP. E.g. fat/recombined skimmed milk and cream/milk
Description	The mixer consists of a number of helical blending elements mounted in a stainless steel tube
Capacity	Dependent on the medium. Available in size: DN40-80 1.5

Advantages

- 3A certified
- Low-cost mixing alternative - no tank is required
- Reliable mixing directly in the pipes
- Easy to maintain
- Fast and easy CIP-cleaning

Mixer TPM+

A reliable powder mixer

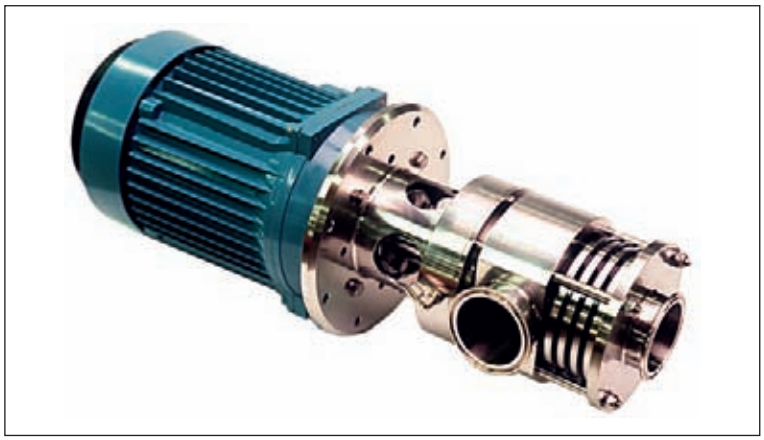
Specifications	
Field of application	When powder/granulates is first added to and then dissolved in a liquid
Description	Powder is added to the mixer via a butterfly valve. The valve controls the flow of powder and prevents air entering the mixer
Capacity	Dependent on the medium
Sealing material	EPDM, FPM
Max. flow	TPM+1: 25,000 l/h (6,500 U.S. g/h) TPM+2: 50,000 l/h (13,000 U.S. g/h)
Temperature profile/ range	Max. product temperature during mixing is 60°C (140°F)
Max. head	1.5 bar (22 psi)

Advantages

- Easy to maintain - the shaft seals are changed easily
- Reliable design due to the sturdy construction
- Hygienic, CIP-friendly design
- Reduced maintenance costs, when other APV pumps are being used. The shaft seals are identical to the ones used in W+/WS

DarMix+

In-line mixer for mixing of butter and butter blends



Specifications	
Field of application	Butter, butter spreads, dairy blend
Description	Compact and highly efficient in-line mixer. Mixing intensity (rpm) controlled by a frequency converter
Temperature	8 - 18°C (46,4 - 64,4°F)

Advantages

- Applicable for high- and low-viscosity products
- Ensures a homogeneous product
- No product contacting bearings
- Compact design
- Cleaning simultaneously with the pipeline

Continuous sugar dissolver - CSD

Optimum flexibility and great cost saving potential

Specifications	
Field of application	Beverages
Description	The CSD is a fully automatic sugar syrup blending system, which can readily be integrated with any APV beverage process unit. Capable of producing sugar syrup up to 72°C (162°F) Brix
Capacity	5,000 - 50,000 l/h (1,000 - 15,000 U.S. g/h)

Advantages

- An accuracy of <+ 0.1°Brix in the final product (measured as a standard deviation)
- Blending control takes place via Brix analyses
- The jet mix principle is used for optimum dissolving in the dissolver tank
- A more precise and consistent product, resulting in savings in raw ingredient consumption
- Flexible and fully automatic system
- Fast settling time
- High accuracy level
- Designed for low maintenance and energy costs

In-line blending - BlendMaster

New dimensions in flexibility and efficiency in blending

Specifications	
Field of application	Juice beverages, diet beverage products, alcohol based beverages
Description	Fully automatic, two-stream or multi-stream blending system that integrates easily with any APV process systems for Brewery and Beverage applications. The standard Brix-Master can store and handle up to 30 different recipes. Suitable for diet product processing. Simple conversion of the basic two-stream BlendMaster for added versatility
Capacity	5,000 - 30,000 l/h (1,000 - 8,000 U.S. g/h)

Advantages

- Ensures exact conformity with the specified recipe
- High calibration stability
- High-precision blending
- Space-saving design (high capacity/m²) (sq. feet)
- Continuous monitoring and regulation of the combined product
- Automatic switch-off, if offset exceeds the limit
- Easy change of recipe for fast product change
- Turn down ratio 25% of nominal capacity
- Blending ratio 1:10 to 1:2
- Brix measurement as an option. Accuracy of <+ 0.05°Brix in the final product (measured as a standard deviation)

Carbonation and nitrogenation - CarboMaster

Cost effective, accurate and flexible gas-dosing

Specifications	
Field of application	Brewery and Beverage
Description	The heart of the CarboMaster unit is the patented gas injector, which injects liquid into the gas rather than traditional injection of gas into liquid. This achieves faster dissolution with tight binding of gas such as CO_2 and N_2 to the beverage. While a measuring instrument can be used to monitor gas addition and to control the dosing set-point, mass flow measurement for the gas provides superior accuracy, typically + 0.05 g/kg gas in the beverage
Capacity	5,000 - 70,000 l/h (1,000 - 20,000 U.S. g/h)

Advantages

- High dosing accuracy (+/- 0.05 g gas/kg product)
- Injection independent of inlet temperature and pressure
- No gas losses
- Space-saving design
- Holding time not necessary
- Turn down to 25% of nominal capacity
- Injects and dissolves up to 10 g gas/kg product
- Constant monitoring and control of final product
- Fully CIP-cleanable

Wort cooling, yeast dosing and wort aeration - WortMaster

Economical production by minimising production time and the use of additives

Specifications	
Field of application	Brewery
Description	The WortMaster product range comprises wort cooling, yeast dosing and wort aeration units. In addition to fast and efficient wort cooling, Designed for easy integration with existing lines, WortMaster units enable effective and accurate in-line dosing of yeast and oxygen using the patented APV gas injector
Capacity	50 - 1,200 hl/h (1,000 - 30,000 U.S. g/h)

Advantages

- Constant monitoring and improved regulation of the process
- Repeatable fermentation performance
- Higher accuracy in yeast and oxygen dosing
- Reduced fermentation time
- Turn down ratio to 25% of nominal capacity
- Constant yeast/oxygen ratio, regardless of flow
- Fully CIP-cleanable
- Traceable production data

CompoMaster - standardisation systems

Getting the most out of milk

The success of a dairy operation today is dependent on optimal utilisation of high-value milk components (fat and protein).

The CompoMaster is designed for continuous standardisation of the fat content in milk and cream. The basic version CompoMaster is directly connected to a separator for in-line standardisation. On-line fat analysis enables you to optimise the production process to an extent, which is not possible in a traditional batch operation method.

Regardless of whether the application is market milk or milk for cheese, powder or condensed production, the tight process control of the advanced CompoMaster with an on-line milk component analysing instrument facilitates improved product consistency and greatly improved production profitability. An investment in this type of standardising equipment saves time, labour and investment in tank capacity.

CompoMaster - KCC

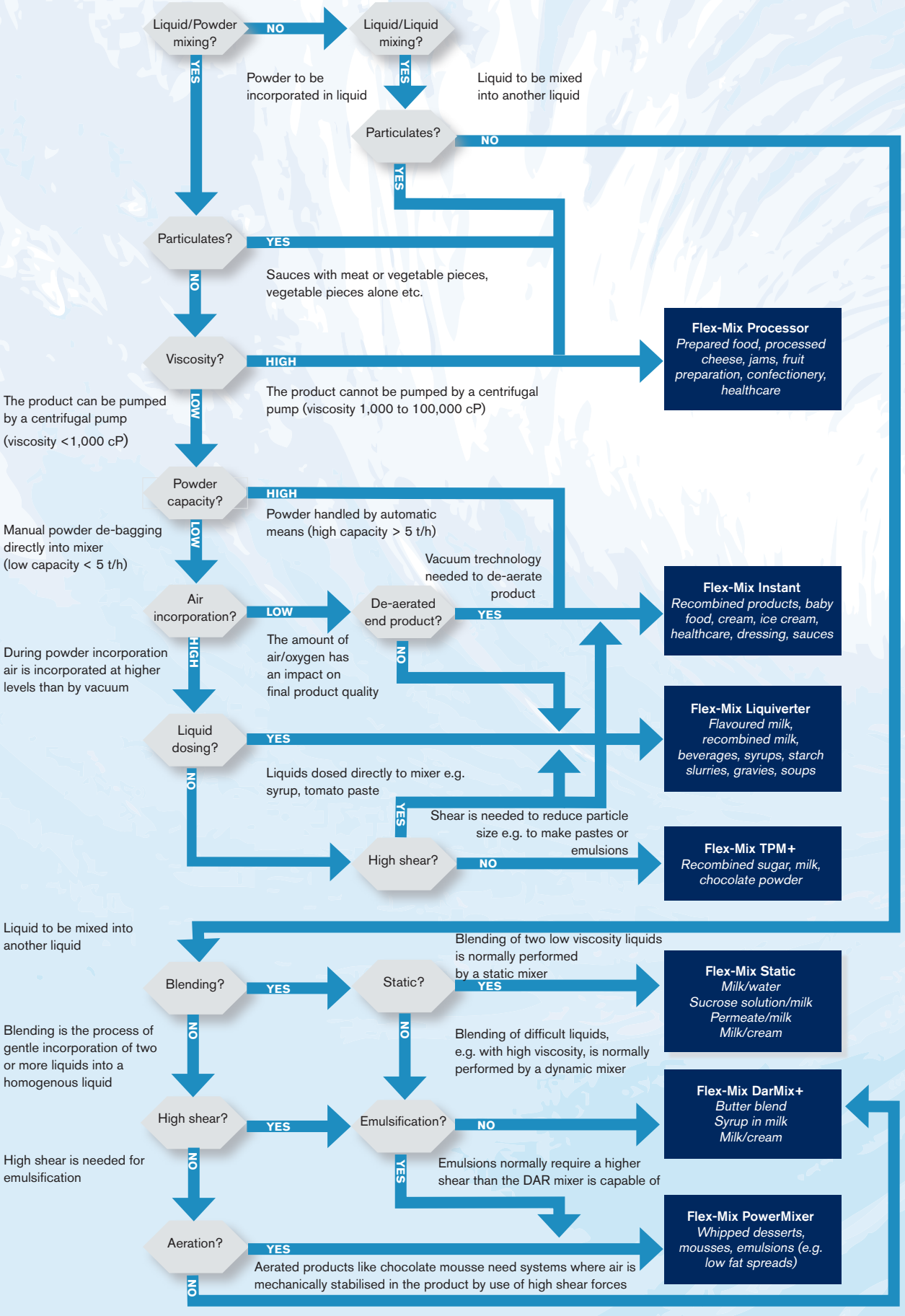
Unit for automatic standardisation of fat content in milk and cream

Specifications	
Field of application	Milk and cream
Description	The CompoMaster is designed for operation together with a milk separator. The fat content of the raw milk is determined automatically using density transmitters after which the CompoMaster fully controls the on-line standardising process
Capacity	7,000 l/h - 60,000 l/h (1,800 - 16,000 U.S. g/h)
Temperature	Milk separation at 55 - 65°C (130 - 150°F)

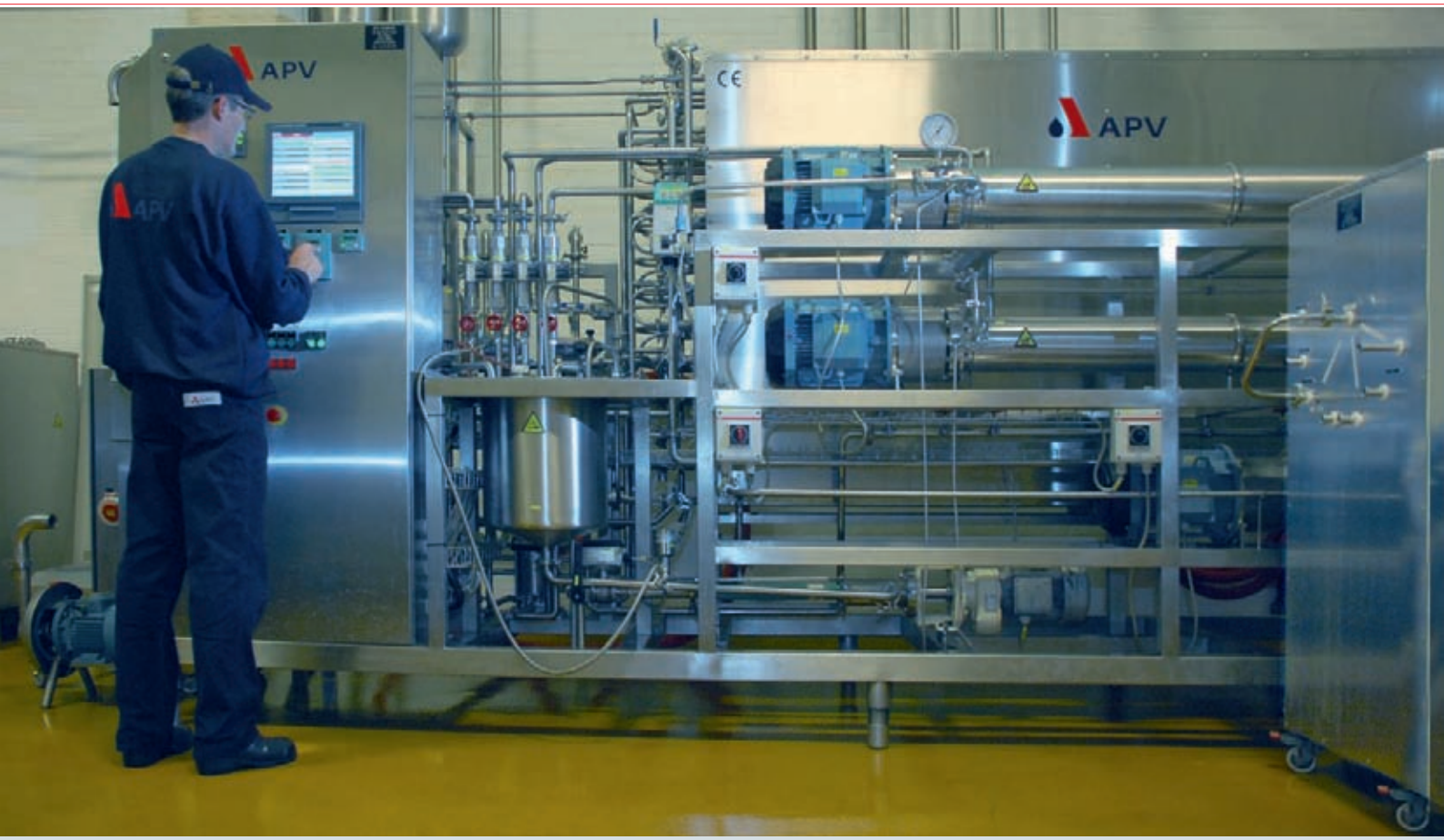
Advantages

- High standardisation accuracy
- Fast control responce to fat set point changes
- Automatic determination of fat content
- Advanced designs for in-line standardisation of fat, protein and solids
- Delivered as a skid-mounted unit ready for installation and commissioning
- Available as stand-alone unit or as unit for full integration into complete milk processing systems

Mixer selection guide



Research and development – APV Innovation Centre



The APV Innovation Centre cooperates closely with APV companies and customers around the world in order to provide a constant stream of innovative, world-class solutions that add decisive competitive value to the businesses of our customers.

Located in Central Jutland, the heart of Danish dairy farming country, the Centre is the focal point of APV's dairy process development activities. The APV Innovation Centre extends its reach far beyond this, however, offering a raft of services for the food industry in the broadest possible sense. These include after sales service, laboratory analyses, technical information and training of APV employees and APV customers.

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

Important keywords for the Centre are innovation, optimum plant dimensioning, high-quality products, and up-to-date knowledge of market requirements. The trials are custom-tailored and can be performed in the Innovation Centre or on customer site. All work on behalf of individual customers is subject to the strictest confidentiality and the highest standards of customer service.

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

Issued: 01/2009 5000-01-01-2009-GB