SEEPEX.
ALL THINGS FLOW

# YOUR PUMP SOLUTION
# FOOD INDUSTRY

# TO MAXIMIZE CLEANLINESS AND QUALITY.

**MODULAR PUMP SYSTEM**

## MARKET-SPECIFIC PRODUCT GROUPS WITH HIGH-PERFORMANCE RANGES

**CUSTOMER-SPECIFIC SOLUTIONS**

- Uniquely innovative
- Reduced life cycle costs
- Extremely energy efficient
- First-class range of services
- Conveying capacity: 0.06 l/h to 500 m³/h (0.016 USGPH to 2,200 USGPM)
- Differential pressures: up to 48 bar (700 psi)

Because of increasing sanitary and food safety standards in the food industry, pumps, which are used in almost all production processes, need to meet strict requirements for:

- Gentle handling
- Absolute cleanliness in all processes
- High operational reliability and safety
- Ease of maintenance

SEEPEX products meet strict product liability laws and the requirements of discerning customers. To address these challenges, efficient and high-quality technology is key.

SEEPEX – a worldwide leader in progressive cavity pump technology since 1972 – has been rising to the challenge and offers a superior range of technically and economically optimized solutions for the food industry.

The SEEPEX modular pump system with a variety of market-specific product groups with high-performance ranges enables a solution for every customer. Each pump is designed according to specific production processes and as the ideal solution for the respective application area.

Depending on the pump range, SEEPEX pumps are built with FDA approved components, certified acc. to the 3-A Sanitary Standards (USA) and designed to be in compliance with EHEDG directives and 3-A Dairy Standards in the USA.

Another SEEPEX advantage: First-class services throughout all the stages of the pump life cycle – securing long-term value of the pump and ensuring optimal operation and life cycle costs.

SEEPEX: A true innovator and leader in the food processing industry.
All things flow.

# MILK AND DAIRY PRODUCTION.

**CONVEYED PRODUCT**

- Milk
- Butter, yogurt
- Cheese
- Cream
- Sour cream
- Curd
- Whey
- Ice cream
- Fruit preparations

**KEY SPECIFICATIONS**

**OPEN, ASEPTIC JOINTS WITH RESIDUE-FREE CIP CLEANING**

**COST SAVINGS**

- Increased production with highest quality and sanitary standards
- Automated systems improve productivity
- Gentle handling of fruit with no damage
- Accurate metering of valuable ingredients
- CIP and SIP saves time and money
- Reduced waste

## BACKGROUND

Dairy products have an increasingly prominent position in the food industry. Milk, butter, cheese and yogurt are very popular and consumed in large quantities. Presently worldwide milk production is at 778 million metric tons annually and growing.

Milk processing is an ancient tradition, but modern technological developments and increased demands for quality and safety have led to more efficient and streamlined process demands.

## TASK

In addition to ever-increasing production volume requirements, specific quality standards must be met. Since dairy products are extremely vulnerable to micro-organism contamination, the very highest standards of hygiene must be applied.

Furthermore, there are countless product variations and large differences in consistency. For example milk, which by pasteurization, homogenization or aseptic heating becomes fresh milk, UHT or ESL-milk. Fermentation, separation or extraction turns milk into products such as butter, cheese or whey.

Dairy products also contain important nutrients like proteins, carbohydrates, vitamins and minerals. It is necessary to preserve these nutrients and delicate natural flavors. Finally, as in the production of fruit yogurt for example, whole fruits and other additives must be handled carefully. All of this puts special demands on food-grade pumps.

## SOLUTION

SEEPEX progressive cavity pumps are perfectly suited to this industry due to their special features, which are ideal for conveying shear sensitive products. The products must be transported very gently with minimal shear, so even ingredients like whole fruits can be processed undamaged. SEEPEX pumps convey thin to highly viscous dairy products like cottage cheese, cream cheese or butter – with virtually no pulsation.



Absolute cleanliness is always the top priority. The special design of SEEPEX pumps – from the dead-space free housing with CIP connections, to the hydrodynamic shaft seals and special quality of the internal surfaces – ensure the complete cleaning of pumps including the accompanying pipes, equipment and control devices. Automated dairy operations benefit from CIP-circulating cleaning fluids within a closed system, with no dismantling or manual cleaning.

Of course, SEEPEX pumps meet the strict requirements of the US 3-A Sanitary Standards and are designed based on EHEDG guidelines.

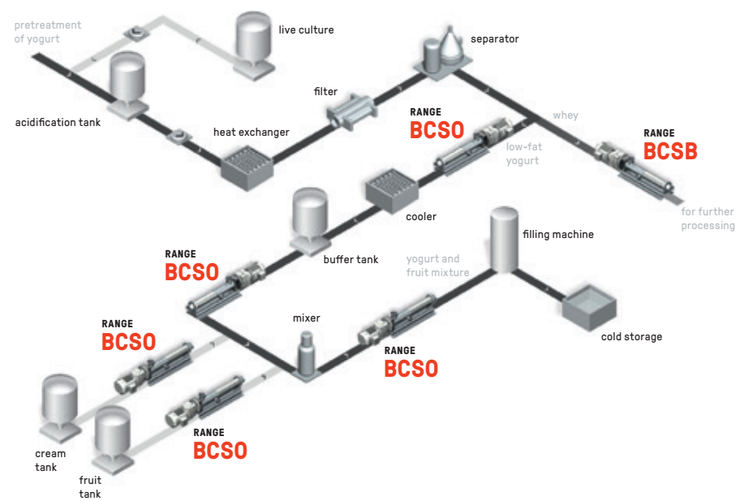
## BENEFITS

- Gentle, minimal pulsation conveyance of products with minimal shear
- Conveyance of thin to highly viscous products
- Accurate metering of ingredients
- Non-destructive conveyance of fruits
- Hygienic enclosed pump systems
- Residue-free CIP (Clean in Place) and SIP (Sterilization in Place)

## YOGURT MANUFACTURING FLOW CHART

**APPLICATIONS**

1. BCSB range pumps convey whey for further processing
2. BCSO range pumps convey yogurt from the separator through the cooler into the buffer tank
3. BCSO range pumps convey yogurt from the buffer tank to the mixer
4. BCSO range pumps convey cream from the cream tank
5. BCSO range pumps convey fruit from the fruit tank for mixing with cream and yogurt
6. BCSO range pumps convey the yogurt and fruit mixture into the filling machine



# DOUGH PROCESSING AND BAKED GOODS PRODUCTION.

**CONVEYED PRODUCT**

- Biscuit and cookie dough
- Cake batter
- Yeast, buttermilk, dairy products
- Glazes
- Icing, fondant
- Meat pie, fruit pie and strudel filling
- Solid fats and liquid oil
- Jelly and jam
- Sauce
- Colors, flavors and minor ingredients
- Flavored oil sprays

**KEY SPECIFICATIONS**

**GENTLE, LOW SHEAR PRODUCT HANDLING**

**PUMPING OF VISCOUS AND STICKY PRODUCTS**

**ACCURATE DOSING AND CONTROL**

**COST SAVINGS**

- Product quality ensured, less waste and reduced manual handling of viscous materials
- Automated systems improve productivity
- CIP and SIP saves time and money
- Accurate use of valuable ingredients

## BACKGROUND

For centuries, baked products have been a staple for most cultures around the world. Grain flour, cereals and other ingredients are converted into diverse products such as bread, pastries and pies, pizza, cakes or doughnuts – with many regional variations and specialties. Modern baked goods and convenience foods incorporate fillings, added ingredients, icing, sauces and other toppings.

## TASK

The demand for high quality products requires sophisticated technologies that can convey without product damage, reduce the manual handling of difficult to convey products – for example heavy, viscous, sticky products and those which have entrained soft solids – and improve production efficiency. Basic dough, and the ingredients used to make it (such as yeast) are sensitive to shearing and temperature, so it requires gentle handling. It is also imperative to maintain the highest standards of cleanliness for product quality and strict safety regulations.

## SOLUTION

SEEPEX offers a wide range of solutions for the many varied and specific applications within this industry. Product group CS and D pumps are perfectly suited to convey and meter a wide variety of ingredients – adding exact quantities to dough and batter recipes. They are also ideal for applying and spraying fillings, sauces and glazes directly onto and into products like bread, pastry or pizza dough. Low shear transfer, minimal pulsation flow and the ability to handle even large soft solids without damage ensures high quality products.

Open hopper pumps with an integrated auger feed screw from the BT and BTCS ranges are particularly designed to handle highly viscous and sticky products that do not flow – such as cookie and biscuit dough or pie and strudel fillings. The low shear characteristics preserve the product's integrity during transportation, especially when raisins and nuts and fillings with large soft solids are included.

When necessary for temperature sensitive products, a special heated jacket maintains constant product temperature during operation for optimum flow and product quality.



For the highest sanitary standards, pumps must be cleaned of any residue after each operation. SEEPEX pumps are equipped with a CIP (Clean in Place) connection, enabling efficient CIP within a production process without dismantling the pump, and SIP (Sterilization in Place) allowing sterilization during the cyclic operation of the pump. Spray balls and other accessories can be added as the customer requires.

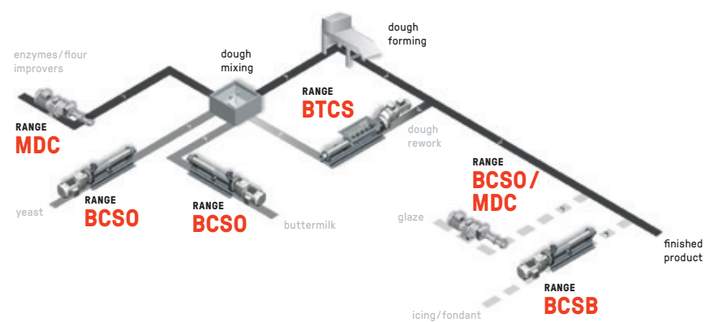
## BENEFITS

- Gentle, low shear conveying of shear-sensitive products
- Accurate metering of expensive ingredients
- Handling of products containing soft solids without damage
- Streamlined process of adding sauces or fillings directly into or onto products
- Easy calibration for recipe and process variations
- Suction lift for viscous products or for vacuum condensation is possible
- Custom designs and automation possibilities to fit most production applications

## MANUFACTURING OF BREAD/BUN DOUGH FLOW CHART

**APPLICATIONS**

1. BCSO/MDC range pumps transport and precisely measure ingredients to be added to dough and batter
2. BTCS range pumps gently transport highly viscous products that do not naturally flow
3. BCSO/MDC/BCSB range pumps add icings and glazes to be injected directly or coated onto the product



# CONFECTIONERY INDUSTRY.

**CONVEYED PRODUCT**

- Nougat
- Caramel
- Licorice paste
- Chocolate
- Jelly
- Fondants and icings
- Colors, flavors and minor ingredients

**KEY SPECIFICATIONS**

**GENTLE, HYGIENIC AND ACCURATE PRODUCT HANDLING**

**TEMPERATURE CONTROL OF SENSITIVE PRODUCTS**

**VISCOUS, STICKY AND NON-FLOWABLE PRODUCTS HANDLED**

**COST SAVINGS**

- Increased product consistency, quality and production efficiency
- Reduced manual handling of viscous products
- Automated systems improve productivity
- Accurate dosing improves product consistency and quality
- Reduced waste

## BACKGROUND

Chocolate bars, chewy sweets, caramel bars and nougat – the confectionery industry produces a wide variety of products from raw materials that are sticky, viscous and shear sensitive. Sophisticated production techniques produce traditional products, as well as new innovations in the chocolate and candy industry, all manufactured to high standards and consistencies.

## TASK

A high quality product requires advanced technology that is able to convey without product damage, reduce the manual handling of viscous and sticky raw materials and improve production efficiency. Controlled, constant temperatures are a big factor in production, as well as high pressures and accurate metering of ingredients. It is also imperative to maintain the highest standards of hygiene and to adhere to strict safety guidelines.

## SOLUTION

SEEPEX offers a comprehensive range of solutions for the confectionery industry. Product group CS pumps are perfectly suited to convey various ingredients, especially if they contain materials that are easily tainted like milk or eggs. Minimal pulsation flow with low shear – even when dosing directly into base products – and the ability to handle soft solids without damage, ensures a high quality product.

Open hopper BTCS range pumps handle highly viscous and sticky products that do not flow – such as licorice pastes, fondant, nougat and chewing gum mass. MD and MDT dosing pumps enable both flowable and highly viscous ingredients to be accurately metered, even very small quantities. They have constant minimal pulsation flow rates independent of pressure and viscosity.

Optional heated jacket designs maintain constant product temperature during operation for optimum flow and product quality, and high or varying temperature products can be pumped using even wall stator technology. For the highest sanitary standards, SEEPEX pumps are equipped with a CIP connection, enabling efficient CIP within a production process.

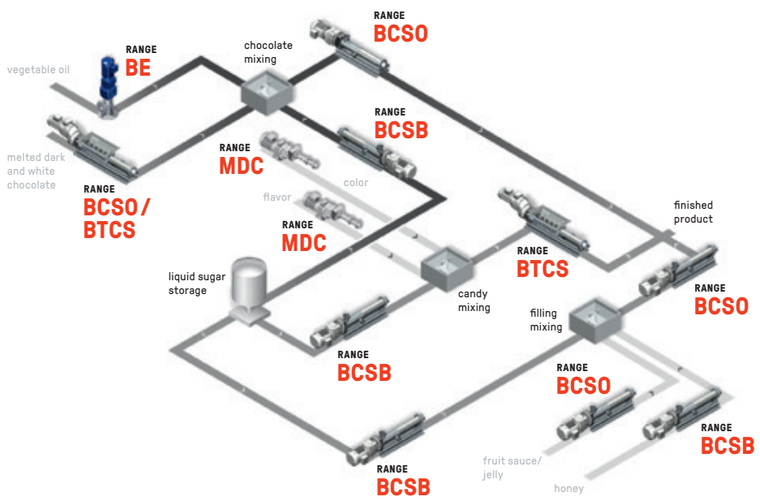
## BENEFITS

- Gentle, low shear conveying of shear-sensitive products
- Handling of products containing soft solids without damage
- Temperatures can be maintained and high temperature mixes handled
- Precise dosing of ingredients in very small quantities, even into viscous product streams

## CONFECTIONERY INDUSTRY FLOW CHART

**APPLICATIONS**

1. BCSO/BTCS/MDC/BE pumps transport and accurately meter ingredients for confectionery recipes
2. BTCS range pumps transfer highly viscous products that do not flow
3. BCSO/MDC pumps precisely meter additional ingredients for confectionery recipes or those applied directly into or onto the product



# SAUCE AND DRESSING PRODUCTION.

**CONVEYED PRODUCT**

- Tomato paste and puree
- Fruit concentrate
- Vinegar
- Sugar syrups
- Herb puree
- Fruit puree
- Fats and oils
- Cream, dairy products
- Soft cheese
- Colors, flavors and minor ingredients
- Alcohol-based aromas

**KEY SPECIFICATIONS**

**GENTLE, HYGIENIC AND ACCURATE PRODUCT HANDLING**

**ACCURATE LINEAR FLOW CONTROL**

**CONSTANT FLOW REGARDLESS OF VISCOSITY**

**COST SAVINGS**

- Increased production, efficiency and quality
- Less manual handling of viscous materials
- Accurate use of valuable ingredients

## BACKGROUND

Sauces and dressings are used every day to enhance the flavor of our foods with many varied applications – from seafood and meat marinades, the sweet syrups and sauces on baked goods, to the use of mayonnaise and dressings on sandwiches and salads. This dynamic industry constantly produces innovative recipes, adding new products and flavors to meet the ever-changing food trends and tastes of consumers.

## TASK

Production of different sauces and dressings has several common requirements. They often contain various solid particles, ranging from herbs and spices to whole pieces of fruit and vegetables. They are made from many different ingredients, blended to create the final product. They can be sticky (fruit syrup), viscous (dressings, mayonnaise and sauces) or thin and flowable (vinaigrettes and some dressings). And most of all, they need to be produced under the highest standards of cleanliness and food safety.

## SOLUTION

SEEPEX offers comprehensive solutions for this specialized industry – where shear-sensitive ingredients need to be gently conveyed through the entire production process: from bulk containers, to blending tanks, to cooking vessels and finally to filling areas and containers – with a resultant consistently high quality product.

Product group CS pumps are designed to convey various raw materials and sauces and dressings. Open hopper pumps from the BTCS range are particularly suited to handle viscous and sticky products such as tomato paste, soft cheese and fruit purees. Product group D pumps accurately meter very small quantities of minor ingredients like acidity regulators, sweeteners and flavor or aroma essences. SEEPEX pumps in the BCSO/BCSB and MD ranges can be vertically mounted for easy emptying of storage and production vessels.

For the highest sanitary standards, the pumps must be cleaned of residue after each production interval. SEEPEX pumps are equipped with a CIP connection, enabling efficient CIP within a production process without dismantling the pump, and SIP allowing sterilization during the cyclic operation of the pump.



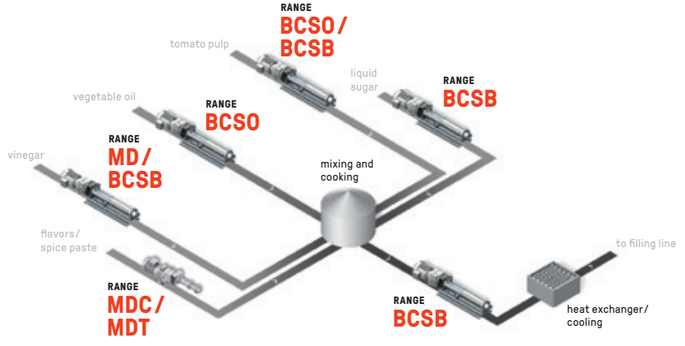
## BENEFITS

- Gentle, minimal pulsation conveyance of products without shear damage
- Handling of products containing soft solids and discrete particles without damage
- Flow rate directly proportional to pump speed – providing exact portion control
- Accurate metering of ingredients for product consistency
- Easy calibration for recipe and process variations
- Customized designs and automation possibilities to fit any production application
- Hygienically designed, enclosed pump systems meet strict US 3-A Sanitary Standards
- Residue-free CIP and SIP for less downtime

## SAUCE MANUFACTURING FLOW CHART

**APPLICATIONS**

1. BCSO/BCSB range pumps transport raw materials and accurately meter them into mixing vessels
2. MDC/MDT dosing pumps accurately transport and meter minor ingredients such as spices, colors and flavors
3. BCSB range pumps transfer blended product with low shear transfer



# METERING AND DOSING.

**CONVEYED PRODUCT**

- Colors and flavors
- Alcohol based aromas
- Syrups and sauces
- Enzymes, vitamins and minerals
- Chemicals for water treatment

**KEY SPECIFICATIONS**

**ACCURATE, LINEAR METERING**

**WITH MINIMAL PULSATION AND LOW FLOW RATES**

**COST SAVINGS**

- Increased efficiency and quality
- Automated systems improve productivity
- Accurate use of valuable ingredients
- High quality and consistent production
- Reduced waste – fewer rejects
- Less downtime for re-calibration

## BACKGROUND

Food manufacturers produce products from a wide range of raw materials for numerous customers. In order to produce these products consistently and to their necessary high standards, it is essential to be able to accurately meter ingredients in the correct quantities for each recipe and product. Control of the product flow throughout every step of the production process is essential to ensure optimal manufacturing conditions.

## TASK

In order to obtain a consistently high quality product, a constant and virtually pulsation free flow that can be calibrated to match the different recipe requirements and variable raw materials is required. Products need to be metered and controlled as they go through the entire manufacturing process – from ingredients added to the flow all the way to the filling areas and containers, or when direct application onto products takes place. Shear sensitive, highly viscous and abrasive products – including those containing soft solids – require gentle handling and strict sanitary and safety standards have to be adhered to at all times.

## SOLUTION

SEEPEX offers a sophisticated range of solutions for this delicate and specialized function. SEEPEX pumps are perfectly suited to accurately meter various products and ingredients – providing low shear transfer, low pulsation flow and the handling of soft solids with no damage. Products can be low to highly viscous or abrasive, and even the addition of very small amounts of minor ingredients can be controlled accurately – whether for a recipe, or to apply directly onto products such as cookie, pastry or pizza bases. Direct application to product surfaces allows for continuous production, and adjustable flow rates in direct proportion to the pump speed – coupled with the linear accuracy of the flow – provides easy calibration and steady control through every step of the manufacturing process.



## BENEFITS

- Repeatable, consistent flow directly proportional to pump speed
- Linear accuracy
- Very low flow rates possible
- Gentle, low shear and minimal pulsation conveyance
- Handling of products containing soft solids without damage
- Accurate metering of ingredients for product consistency
- Less product waste, more accurate use of valuable ingredients
- Easy calibration and maintenance

# PET FOOD PRODUCTION.

**CONVEYED PRODUCT**

- Meat and meat products
- Molasses
- Colors
- Flavors, vitamins and minerals

**KEY SPECIFICATIONS**

**GENTLE, HYGIENIC AND ACCURATE PRODUCT HANDLING**

**HIGHLY VISCOUS PRODUCTS WITH SOFT SOLIDS PUMPED**

**COST SAVINGS**

- Increased operational efficiency
- Consistent high product quality
- CIP cleaning saves time and money
- Accurate use of valuable ingredients

## BACKGROUND

The nutritional wellbeing of our pets is very important to us – so the pet food industry produces appetizing food and a balanced diet for healthy cats, dogs and other pets. Pet food in cans and pouches, dry food and treats are all produced with the help of SEEPEX pumps.

## TASK

Pet food production requires state-of-the-art technology to convey viscous products with large solid pieces to further processes and to filling machines. Many of these raw materials require additional cutting and chopping. Conveyance and mixing of meat and other raw materials, together with the accurate metering of added ingredients – such as colors, flavors, vitamins and minerals – is essential to ensure high and consistent product quality.

## SOLUTION

SEEPEX offers smart solutions for the pet food industry. The BN range pumps with macerators are able to process meat pieces into a homogenous ingredient for further processing. With the BN and BT range pumps, meat slurry is conveyed to cookers and extruders. The BTM range pumps are perfectly suited for cutting incoming meat blocks and then mixing in various ingredients added by D dosing pumps.

Product group D pumps, with accurate flow rates and minimal pulsation, are used for direct application of flavors and coatings to pet treats and snacks. SEEPEX pumps can be equipped with a CIP connection. CIP saves time by hygienically cleaning SEEPEX pumps without having to dismantle them.

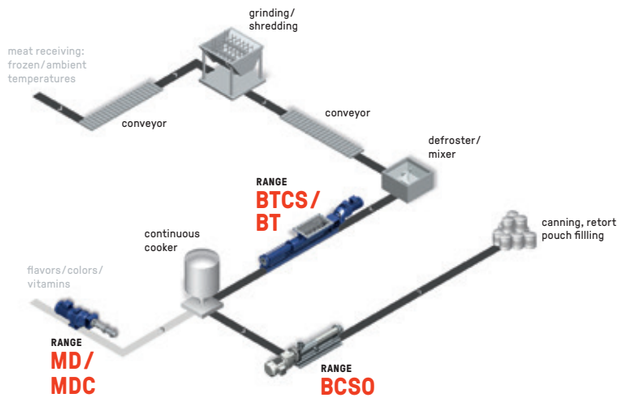
## BENEFITS

- Enclosed systems improve hygiene
- Accurate metering and precise, minimal pulsation dosing
- Conveying of highly viscous products containing large solids
- Cutting and chopping when necessary for raw material processing
- Non-destructive conveying of solid meat pieces within gravy and sauces

## WET PET FOOD PRODUCTION FLOW CHART

**APPLICATIONS**

1. BT/BTCS open hopper pumps mix and transfer high viscosity defrosted meat to the cooker
2. MD/MDC range pumps accurately meter minor ingredients such as colors, flavors and nutrients into the cooker
3. BCSO range pumps transfer cooked meat products to the filling machines



# FURTHER APPLICATIONS.

Due to their distinctive design and functionality, SEEPEX progressive cavity pumps are successfully used in many other areas of the food industry such as the beverage, fishing or fruit and vegetable industries.

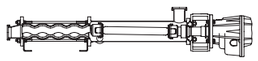
SEEPEX pumps are utilized in not only the production process, but also provide optimal results for the food and beverage industry in waste food handling.

With their hygienic and safe design, they are also perfectly suited for the pharmaceutical and cosmetic industries.

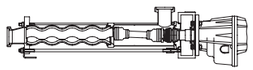
Thanks to the modular design and a wide variety of material combinations, the most technically and economically optimized pump can be created to suit every individual application. SEEPEX progressive cavity pumps, macerators and control systems offer you the best performance, highest reliability and lowest life cycle costs.

# YOUR PUMP SOLUTIONS AT A GLANCE.

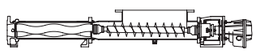
**BCSO RANGE**



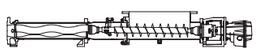
**BCSB RANGE**



**BT RANGE**



**BTM RANGE**



SEEPEX pumps transport thin to highly viscous products with or without solids at low to high temperatures, gently, with minimal pulsation and low shear. They also feature excellent metering accuracy.

BCSO range pumps are equipped with open, aseptic joints which guarantee residue-free cleaning with CIP and enable higher pressure and conveying capacities. They also feature high corrosion and wear-resistance, meet the highest hygienic requirements set by the FDA, US 3-A Sanitary Standards and the EHEDG, as well as being particularly easy to maintain.

The BCSB range pumps differ from the BCSO in their joint design; established closed and wear resistant pin joints are used. They are suitable for high operating pressures and abrasive products.

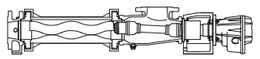
- Conveying capacity: 30 l/h–130 $m^3$/h (0.132–572 USGPM)
- Pressure: up to 24 bar (350 psi)

BT, BTM and BTEI range pumps from product group T as well as the BTCS range pump from product group CS all feature a feed hopper with an auger feed screw and compression zone. The length of the hopper opening is adapted to the operating conditions. They are used to convey highly viscous products with a low inherent flow rate. The BTEI range features a supply tank that can be adapted to the application conditions on site. The hygienic design features either open or closed pin joints and meet the US 3-A Sanitary Standards.

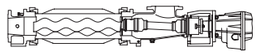
- Conveying capacity: 50 l/h–500 $m^3$/h (0.22–2,200 USGPM)
- Pressure: up to 36 bar (525 psi)



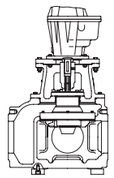
**1-STAGE SCT**



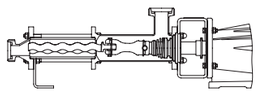
**2-STAGE SCT**



**I RANGE**



**MDC RANGE**



Smart Conveying Technology (SCT) means faster maintenance as the time to replace the rotor and stator can be reduced by 85%. The patented, award winning design of SCT enables the stator to be adjusted to suit the application and to adjust for wear – leading to double the lifetime of the rotor and stator. Downtime and life cycle costs are also reduced.

- Conveying capacity: 130 $m^3$/h (572 USGPM)
- Pressure: up to 8 bar (120 psi)

SEEPEX macerators chop solids and reduce the particle size of the pumped product to meet production demands, to improve reliability and to extend the service life of downstream equipment. They can be integrated into pipelines or supply tanks and connected directly to a SEEPEX pump.

- Flow rate: 2–150 $m^3$/h (8.8–660 USGPM)

Product group D pumps meter small quantities in all industry sectors. They achieve a metering accuracy of ±1%, conveying thin to highly viscous or abrasive products, with or without solids. They are used for precise metering of vitamins, yeast, enzymes, minerals, colors, flavors, scents and syrup. MDTC range pumps transport and measure high viscosity ingredients to be added to recipes or to be applied directly onto base products. The MDC and MDTC ranges meet 3-A Sanitary Standards.

- Conveying capacity: 0.06–1,000 l/h (0.016–264 USGPH)
- Pressure: up to 24 bar (350 psi)

SEEPEX.

ALL THINGS FLOW

**SEEPEX GmbH**
www.seepex.com

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