Global Presence

Addresses of all business partners in 60 countries are available upon request or by visiting:

www.netzsch-pumps.com

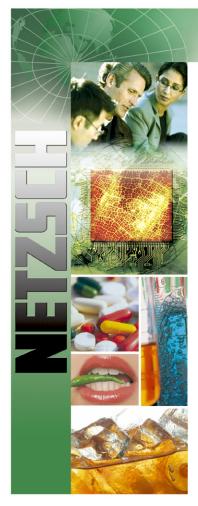




NETZSCH Mohnopumpen GmbH Geretsrieder Straße 1 D-84478 Waldkraiburg Phone: +49 8638 63-0 Fax: +49 8638 67981

E-mail: info@nmp.netzsch.com www.netzsch-pumps.com





NETZSCH The heart of your process

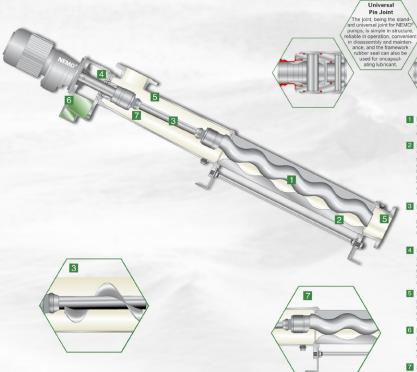
Clever Solutions for your Success





Components of the NEMO® Standard Pump





will be needed to add in.

Open type

universal joint

The medium can

be used for lubricant

and no lubricant

1 Rotor

The rotor, made of anticorrosion metals, is polished on its surface and a high-grade smooth finish is gained.

2 Stator

The stator is formed by ejecting rubber material into a steel tube, the seals are naturally produced on both terminals, and no additional O rings or rubber packing needed. The materials inside the tube can be various elastic rubber materials, plastics, and complete metal. The materials should accord with the authentications of food grade of SBBPF and EPBPF (BPF is the abbreviation of the authentication of food grade of GBPF, and EPBPF GPF).

3 Drive chain

Transmission shaft and extension shaft transmit the motive power to the rotor through a coupling shaft that has two universal joints at both ends, and a coupling shaft with a screw feeder can also be chosen.

4 Shaft Seal

Standard desigh with single-acting, wear-resistant mechanical seal independent of the direction of rotation; on request different types of single-doubleacting mechanical seals by various manufacturers, cartidge and special seals as well as aland packing.

5 Suction and Pressure Housing

Designed for good flow conditions with flanges or threads acc. to DIN and international standards. Materials in cast iron, nickel chromium steel, rubbercoated cast iron as well as special materials according to specifications.

6 Block Desigh

Drives flanged directly to the housing reduces length, weight and gives a constant shaft height independent of construction and size of the drive. It is both maintenance and service-friendly as well as economical.

7 Stator Inlet

Staror inlet with taper to facilitate the entry of the fluid into the conveying chamber.



Components of the NEMO° Progressing Cavity Pump e.g. the NEMO° Block Pump in Hygienic Design



Single seal, unbalanced, independent of direction of rotation, elastomere bellows with or without knife edge. Seals in SIC. On request elastomere is compliance with FDA standards.

anced, independent of direction of trotation, with product protected spring, Smooth surface. Seals in SIC. Elastomere in compliance with FDA standards.

Single seal, bal-

Titanium Flexible Rod

The flexible rod for universal use in the NEMO® Hygienic Plus series is made from titanium. It is corrosionproof, crevice free, wear-and maintenance free because there are no components moving against each other as in other joint types. Furthermore, the high elastic modulus of titanium allows for a short construction. Neither lubrication nor seals are required so that the lubricity of the fluid does not have to be taken into consideration. Ideal for pumping highly sensitive products with or without solids and for uncompromising hygienic applications.



Feeding Screw Hopper

For highly viscous and pasty products, the pump is optionally equipped with a feeding screw and a hopper to allow for an optimal filling of the conveying chambers.



Heating Rail and Thermal Jacket

Optional version with pump housing and stator which can be heated or cooled.

1 Rotor

2 Stator with Reduced Wall Thickness

For changing product tem-peratures a patented stator with reduced elastomer wall thickness is used. In addition, a thermal stator protector (STP-2A or STP-D) for overheating and dry running protection is available.

3 Hygienic Joints

Patented, open crevice free hygienic joints for optimal cleaning.

4 Drive Chain

Drive and connection shaft with coupling rod and two hygienic joints for drive transmission to the rotor.

5 Sealing Housing

Food quality mechanical seal in a housing screwed directly to the pump suction body allowing pumping in both directions up to the maximum pump pressure.

6 Stator Jacket

in stainless steel (optional)

7 Stator Bolts

in stainless steel

96







2 Stator with Reduced Wall Thickness

For changing product temperatures a patented stator with reduced elastomer wall thickness is used. In addition, a thermal stator protector (STP-2A or STP-D) for overheating and dry running protection is available.

3 Titanium Flexible Rod

The patented flexible rod manufactured from titanium is corrosion-proof, wear-and maintenance-bree because there are no components moving against each other as in other joint types. The high element modulus of titananium enables the pumps length to be reduced. Neither lubrication no reals are regions of the proof of

4 Double, buffered static seals

All static seals to the atmosphere are double sealed chambers. Strelle condensate, vapour and/or detector fluid is continuously supplied to the chambers. Through the contamination-proof design the process cycle can be reduced by the removal of some sterilization processes. Consequently output capacity increases as the number of cleaning cycles decreases. This allows for new possibilities to improve product quality by sterile handling where taste and flavour remain unchanged and the shelf life is prolonged.

5 Housing / Discharge Flange

The pump housing has a reduced diameter for opinal flow velocity and minimized pump volume. The body flange is located directly above the shaft soal removing any dead flow areas. Therefore the deposit of fluid in the housing during the manufacturing cycle is eliminated. The tangential arrangement of the cleaning ports initiate a helical flow during cleaning which guarantees percleaning of the whole pump body. In addition, the pump will be completely empties.

6 Sealing Housing

Food quality mechanical seals in a housing screwed directly to the pump suction body allow pumping in both directions up to the maximum pump pressure.

7 Bearing Housing

Widely spaced, heavy duty bearings ensure optimum concentricity of the drive shaft and are able to withstand large axial loads. The free shaft end allows for the use of all types of drive.

8 Pipework (optional)

The pipework circulates sterile condensate, vapour and / or detector fluid to the double acting, closed seal lines.



General Features of the NEMO® Hygienic and Aseptic Progressing Cavity Pumps

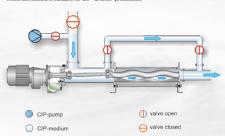
The hygienic design of components and machinery as well as the cleanability of process plant are defined in a multitude of rules and regulations. NEMO® Pumps are constructed, manufactured and tested according to EHEDG regulations (European Hygienic Equipment Design Group) or QHD regulations (Qualified Hygienic Design). The materials used are certified in accordance with FDA (Food and Drug Administration), BoVV (Bundesinstitut für Gesundheitlichen Verbraucherschutz und Veterinärmedizin) and PL(Positive List / Japan).

Additionally, NEMO® Hygienic and Aseptic Progressing Cavity Pumps are certified according to the 3-A Sanitary Standards of the US and GOST-R (Russian Certificate of Conformity).

CIP-/SIP-Process

For the CIP process, the entire system requires a cleaning fluid velocity of at least 1.5 m/s and to facilitate this the NEMO® Hygienic and Aseptic Progressing Cavity Pumps are equipped with additional cleaning ports. The position of these ports can be determined to suit the application and they require a bypass pipe. The bypass is also required for the SIP process. In both the CIP and SIP processes the NEMO® pumps are operated intermittently.

Tangential cleaning ports guarantee complete emptying of the NEMO® pump. All pump materials used are suitable for CIP- and SIP processes.



Wide Range of Applications



NEMO® Hygienic and Aseptic Progressing Cavity Pumps are normally used for fluids having the following properties:

- · of low up to high viscosity
- · smearing and non-smearing
- · with or without solids
- · dilatant or thixotropic
- · abrasive
- · adhesive

Wide range of flow rates and pressures

- · flow rates from a few ml/h up to 140 m3/h
- · pressures up to 36 bar

Advantages of NEMO® Hygienic and Aseptic Progressing Cavity Pumps

- · smooth delivery
- · long process cycles due to contamination-proof and sterile design
- · suitable for CIP and SIP
- · almost pulsation-free conveyance
- · food quality mechanical seal in a housing screwed directly to the pump suction body allowing operation in both directions up to the maximum pump pressure
- · flow rate in proportion to speed with high dosing accuracy over a wide speed range
- · flow rate independent of variances in pressure or viscosity
- · product intake possible in vacuum conditions up to almost total vacuum
- . the crevice free housing designed for good flow condition avoids settling of the fluid
- hopper-shaped stator inlet for optimal filling of the conveying chambers
- · all contact surfaces in polished version to avoid caking of the fluid and to facilitate cleaning
- · for lubricating fluids, open, patented, hygienic joints
- · version with flexible rod for uncompromising hygiene and long serviceable life
- · elastomers in food standards according to BgVV, FDA and PL
- · heating of housing and stator (optional)
- · horizontal or vertical installation
- · service friendly

The media you can pump...

We can pump the following media for you

Industry of Wines and distilled spirit

Grape sludge Sulfur dioxide Active carbon Sulfur Wine

Beer and beverage industry

Malt Grain
Malt sludge Wine lees
Malt juice after steaming and boiling
Hot sludge Ferment
Beer Diatomite

Starch and its derivative industries

Potato mash Potato dregs Brightener Bottamin acid Starch sugar Soya-bean milk Glacose syrup High mati syrup Starch sludge Anicnication starch Com syrup Scredit of sulphuric acidictric acidicalcium Starch solution Yeast Powder of grain element

Sugar industry

Condensed syrup Thin sugar juice Sugar crystals Sugar drogs

Vegetable oil industry

Soapstock Saponated sodium Vegetable glue Edible oil Oilly sluege Grain of monosodium glutamate Waste diatomibe Vegetable oil Semifinished oil

Others

Heated concentrated apple juice

Temperature: 80 ~ 100 °C Density: 1100 kg / m³ Flow rate: 25 m² /n Solid content: 70 % ~ 80 % A NMO78 NEMO® pump is pumping heated apple juice into a cooling tank.



Yeast

Temperature: 4 °C Viscosity: 10000 mPas Density: 1050 kg / m³ Flow rate: 15 m³ / h

Two sets of NM063 NEMO® pumps convey fermented yeast into a press filter, and at the same time, the leftover in the yeast and the wine is separated.



Pomace

Temperature: 20 °C

Density: ≤1200 kg / m³

Flow rate: 10 m³ / h

Solids content: 80 % ~ 90 %

A NM076 NEMO® pump with a hopper

A NM076 NEMO $^{\rm o}$ pump with a hopper and a feeding screw is conveying pomace into a store tank at 8 meters high.



Condensed orange juice

Temperature: -12 ℃ Viscosity: 40000 mPas Density: 1100 kg / m³ Flow rate: 20 m³ / h

Mobile trailer mounted NM063 NEMO® pump is conveying juice into a store tank to ensure the shortest distance between the inlet of the pump and the tank for avoiding cavitation.



Apples

Flow rate: 15 m³ / h Pressure: 8 bar A NM105 NEMO® pump is pumping whole apples.





Temperature: 80 ℃ Density: ≤ 1200 kg / m³

Flow rate: 3 m³ / h Solids content: 30 % ~ 40 %

A NM045 NEMO® pump with hopper and feeding screw is pumping wine lees from a centrifugal separator into a feeding tank.



Flow rate: 0.5 m³ / h Pressure: 5 bar

A NM021 NEMO® pump is pumping pounded mustard powder.

Meat sauce

Temperature: ≤ 50 °C Flow rate: 5 m³ / h Pressure: ≥ 10 bar

A NM053 NEMO $^{\rm 0}$ pump in a food factory in South America is pumping fresh salted beef sauce.

Tomato sauce

Temperature: 60 ~ 80 °C Viscosity: 500 ~ 6000 mPas Density: 1050 kg / m³ Flow rate: 8 m³ / h Solventent: 5 % ~ 28 % A NM045 NEM0® hydignic p

A NM045 NEMO® hygienic pump is pumping tomato sauce to the next process.



Butter

Temperature: 80 ~ 100 ℃ Density: 980 kg / m³ Flow rate: 2 m³ / h Pressure: 8 bar

A NM038 NEMO $^{\scriptsize 0}$ hygienic pump is pumping butter from a metal heater into a sterilizing tank.



We can pump the following media for you

Dairy products

Acidophilus milk with or without juice Butter Bean oil Cheese Cream Crystal white sugar Soy milk

Seasoning Brine Essence Sauce lees Diatomite

Mixture of soybean/ wheat/flour with Peanut butter Yellow water Vinegar lees Monosodium glutamate Salad

Mustard catsup Candy chocolate

lce cream Fondant Cacao powder Chocolate Sweetened bean paste

Flesh and pets' foods

Meat stuffing Pickled beef Sausage Butter Cheese Fish fresh Fishmeal Putting (mixture of flour, milk, and

Bread and toast industry

Baking powder Flour Fluid eggs Egg volk

Juice industry

Carrot juice Tomato sauce/juice/dregs Mashed fruits Fruit juice Impuritiesoffruit peel, stone, and stem Fruit juice, flesh, marc

Lactic acid cheese

Temperature: 4 °C Viscosity: 80 mPas Density: 998 kg / m3 Flow rate: 2 m3/h Solids content: 2 % ~ 5 % A NM038 NEMO® hygienic pump connecting to a CIP washing system is pumping lactic acid cheese from a sterilizer into a feeder.



Chocolate

Temperature: 40 ℃ Viscosity: 120000 mPas Density: 1090 kg / m3 Flow rate: 2 m3/h Solids content: 60 % A NM063 NEMO® high-pressure hygienic pump with a mixer and a screw feeder can pump milk, cacao powder, and complete nuts at the same time.



Syrup

Temperature: 40 ℃

Viscosity: 20000 mPas Density: 1400 kg / m³ Flow rate: 5 m3/h Syrup with normal fluidness and up to 75 % of the highest concentration A NM045BY NEMO® pump is the ideal transport for it.



Cation starch

Temperature: 30 ~ 40 ℃ Viscosity: 3000 mPas Density: 1200 kg / m3 Solids content: 20 % A NM053BY NEMO® pump is conveying cation starch.



Fermented dough

A NM053SF multi-stage NEMO® pump is conveying fermented dough into a bread processing machine.



Slurry of Monosodium glutamate Temperature: 25 ~ 70 ℃

Viscosity: 1000 mPas Density: 1200 kg/m3 Flow rate: 6 m3 / h

Solids content: 60 % (containing crystal grains)

A NM045 NEMO® pump is conveying monosodium glutamate slurry.



Soapstock

Temperature: 40 ~ 100 ℃ Density: 970 kg / m3 pH: 5~7 Flow rate: 15 m3/h

A NM063 NEMO® pump is conveying soapstock.



Potato dregs

Temperature: 25 ℃ Viscosity: 5000 mPas Density: 1100 kg / m3 Flow rate: 16 m3/h Solids content: 15 % ~ 20 % A NM076 NEMO® pump is conveying glutinous potato dregs with high solids content.



Beer

Temperature: 10 ℃ Flow rate: 16 m3/h Pressure: 13 bar A NM038 NEMO® pump applied in beer brewing



Ferment of red wine

Temperature: 10 ~ 30 ℃ Flow rate: 12 m3/h Pressure: 2 ~ 3 bar A NM053 NEMO® pump is conveying ferment of red wine.



We have the same goal



After breaking the malt and grain in a breaker, a NEMO® pump mounted at the bottom of the breaker will pump the malt slurry into a store tank. Then add hot water into the mixture of crashed grain and malt, and malt slurry is made. The aim is to remove the starch in the grain at the most suitable temperature to bring the enzymen into full play. Afterwards, the made-up malt slurry is conveyed into a purifier (strainer), the insoluble malt has been separated here, while the malt slurry has been purified, the glutinous and abrasive waste wine lees and other impurities will be conveyed with a NEMO® pump.

During the process of steaming and boiling, add hop into the container to prevent the activities of bacteria, to increase the peculiar bitter taste of the beer, and to prolong the period of guaranteeing quality at the same time for benefiting digestion. Then apply a NEMO® pump to convey the steamed and boiled malt extract to next process of separation.

The malt extract here still contains some impurities needing to separate; the device here applied for this is a cyclone. The subsided impurities is hot slurry with high temperature, it is the most suitable to apply a NEMO® pump to convey such media. When the mait extract is feeding into a heat exchanger, it will be cooled to 4 $^\circ$ $^\circ$ $^\circ$ there and become the alleged cold slurry, which will be pumped into a floatation tank, here applying a NEMO® pump to feed ferment in fixed amount in it, the chemical reaction started by the terment will facilitate the suagar in the malt turning into alcohol and producing carbon oxide. The just fermented beer is pumped into store tanks and saying there for about 9 $^\circ$ $^\circ$ 44 ays. During the period, the taste of beer is gradually becoming ripe and carbon oxide produced. Afterwards, through filtration by adding diatomite, the beer is pumped into a pressure store tank the used diatomitle has certain viscosity and corrosion, and it is better to be conveyed by using a NEMO® pump.

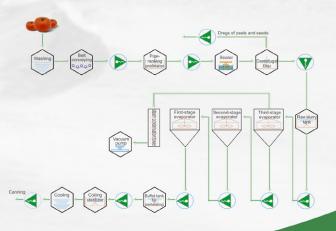
Filtration of Journal Obtaining yeast Add in yeast Boding years Light Store for later Light Store for later Boding of wheat Light Store for later Boding of wheat Store for later Boding of wheat Bo

Tomato ketchup/mayonnaise processing

The main raw materials for mayonnaise are mainly vinegar, oil, water, season, starch and fresh egg yolk. We know every kind of raw materials has its own period of guaranteing quality, so in addition to the conveying according to the correct proportion, the simplicity and convenience of the process is also very important. NEMO® hygienic pump can fully convey all the above media. Because of its special flexible rod and pin connection, therefore, no lubricant is required, and the efficiency of conveyance is greatly improved. All the parts passed by the media are all made of stainless steels, the polishing degrees all conform to hygienic standards, and mechanical seals of food stage are also equipped. The pressure of each stage of the pumps is no higher than 4 bar, the slip velocity is under 1.5 m /s, and the flow rates of the media can be adjusted by regulating the rotational speed. This not only reaches precise feeding, but also guarantees the stable and cutting-free pumping.

The previous processes of tomato sauce are similar to the mayonnaise. It is also applying a NEMO® pump to convey sugar solution, seasoning, and starch in accordance with certain proportion into a container for tomato sauce, and a small quantity of salt is added in for increasing the time of guaranteeing quality. The difference between them is that the tomato sauce should be feeded into a heat exchanger for steaming and boiling. NEMO® pumps will be applied in this process, but different models of NEMO® pumps will be used before and after the heating process. The temperatures of the media out from the heater are up to $60\,^\circ\text{C} \sim 70\,^\circ\text{C}$, it should be considered that the high temperature will lead the stator expanding, therefore, a NEMO® pump with the same model but a rotor with a smaller diameter can satisfy the requirement.

Flow Chart of Tomato ketchup Catsup Processing NEMO® pump



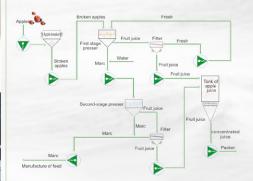
|16||



Apple juice processing

The cleaned fruits of apples, oranges, and pears are first cut to pieces, and then conveyed into a juice extractor, and your best selection is applying a NEMO® pump for the job. Because it is equipped with a hopper and a screw feeder, the fruits are easily fed into the pumping cavity. The pump can extrude the fruits and, at the same time, convey all the flesh, juice, pericarp, and stones together for it has a larger torque. The fruits out of the extractor have already become slurry since extrusion, but it still contains solid granules and fruit stems, then you can apply a NEMO® pump to convey stably the fruit slurry into a stem remover for removing the stems and stones. The process succeeded is fermentation, the fruit slurry is fed into a zymotic tank for staying about 2 ~ 4 weeks, the gases in it will be discharged, after a certain period of time, the fermentation will finish, because there still exist solid granules in the fruit slurry, so it could not distil directly, it should be conveyed into a pool for depositing, the solid impurities from the deposition are conveyed into a waste water pool. Because the solid impurities are more glutinous and abrasive, the NEMO® pumps are perfect for the job of conveyance. Thereout, in the processing of fruit juice mentioned above, we can see that the NEMO® pumps are qualified for almost the pumping work in the processing.

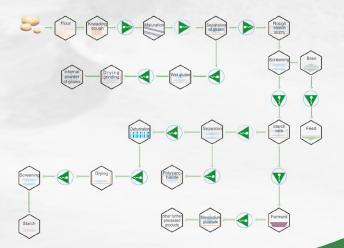
Flow Chart of Apple Juice Processing NEMO® pump



Starch processing

In starch processing, many media should be conveyed with pumps, especially the two basic processes-washing and peeling of potations. The potatoes rather than the factories are needed to wash in dearers for much mud adhering on them. The potatoes after washing are conveyed by a belt conveyer to next process, the wastewater from the washing process is also needed to convey into a wastewater pool. Because the wastewater are very atractive for containing stones and other impurities in it, the selection of NEMO[®] pumps is a wise decision for their excellent performances for the job. The following is peeling of potatoes in a peeler, the driven axis of the peeler is coated with abrasive for grinding the skin from the potatoes by friction, and the waste slurry including potato skins, shivers, and water, is also produced, and it has the properties of viscosity, containing solid granules, and poor fluidness, so the NEMO[®] pumps with hopper are your best choice for the job. Besides, the hygienic NEMO[®] pumps conforming to the hygienic Standards as unitable for pumping edible oil and additives. In the following processes of starch and its derivatives, NEMO[®] pumps will be used almost in every working procedure.

Flow Chart of Starch Processing NEMO® pump



|18||



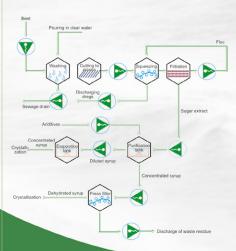
Sugar processing

The main processes are:washing—slicing up—squeezing—purifying—evaporation—crystallizing—storage.

The waste liquid from the washing of boets contains the impurities of mud and sand, which have strong abrasive property and can be perfectly conveyed with normal NEMO* pumps. The purifying is a key process; it is a process of saturation of carbon dioxide. Add ags of carbon oxide into syrup containing milk of line, the combination of the carbon dioxide and the milk of line will produce carbonate containing calcium which will be abstisded with other impurities in the syrup, two outcomes will be obtained in the process, one is saturated thin sugar juice being sent for evaporation, and the other is concentrated syrup having very strong abrasive property, the maximum permitted slip speed in transmission cannot exceed 15 ~ 1.0 m f · s, so it can be conveyed with a NEMO* pump to a press filter, the dehydrated syrup from the filter contains 50 % of solid content, and has very strong viscosity and corrosion. Therefore, a NEMO* pump with a hopper and a screw feeder is your ideal choice. The crystal sugar from the crystalizing process can also be conveyed with a hygleric NEMO* pump for food. Therefore, NEMO* pumps can be seen in almost every process in sugar industry.

Flow Chart of Sugar Processing





Wine brewing

The grapes harvested are sent to wine breweries, through washing and stem removing, they are sent to a juice extractor. A NEMO® pump is mounted at the bottom of the extractor for circuital transmission of the grapes, through several times of squeezing, grape sturry will be finally produced. In order to prevent the grape sturry against oxidation, a mini-model NEMO® pump can be applied for feeding suitable amount of suffur cloxide in it, through the staying in heating, the coloring matter in grape peels and tannin will enter into the juice. The following process is filtration, and the residue from the filtration can be pumped away with a NEMO® pump. In the ferment process, the terment will be added in the grape juice to facilitate the sugar element to turn to alcohol and the gases containing carron will be releaded. Before the purification, in order to stabilize the chemical property of the grape wine, small amount of chemicals such as white glutin, activated carbon, and sulfur can be added in by using the characteristics of accurately feeding of NEMO pumps. The grape wine after purification is the finished product, which has stable properties and smell and can be conveyed with a NEMO® pump to canning process, and the commodity of wine will be shown in the stores.

Flow Chart of Wine Brewing NEMO® pump



Meat and pets' food processing

The processing of meat and pets' food is that the frozen meat is first out to pieces with a cutter, made into meat slurry by putting water in, then according to different foods with different concentrations, different seasonings are added in, finally they are put into an oven to roast. The meat slurry made contains the granules of stone and ice crystal that have storegrea attrastive property, you can choose a NEMO[®] hygienic food pump to do the job for it is fully competent for its excellent performances. When you feed the additives to try to adjust the different tasts for different pets, the NEMO[®] mini-model hygienic food pump can be chosen for accurately feedings by regulating its rotation speeds with a tolerance less than 1%. Besides, the wastewater in the meat slurry and the processing can all be conveyed with a NEMO[®] pump. Therefore, compilet varieties of NEMO[®] pumps can satisfy the requirements for conveyance of almost all the media in all the processes.

Industries of Medicine, Biological products, Cosmetic and Chemicals

In the processes of the above industries, the requirements on hygiene and asepsis are quite rigor. The NEMO® hygienic food pumps and cleaning asepsis pumps designed, manufactured and tested according to the standards of EHEDG and QHD conform to many domestic and foreign hygienic standards and completely meet various requirements.

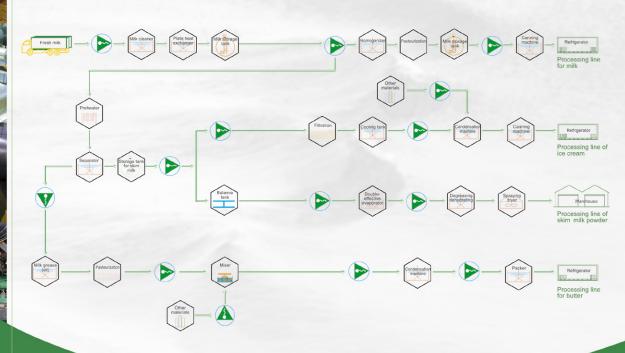
||21|





In the processing of dairy products, the stable conveyance of media is very important. NEMO® pumps can convey media stably, cutting free, and pusleessly, the maximum viscosity of media can be up to 3 million mPas, so it is the best choice for conveying high glutinous media. They are widely applied in the processing of dairy products of milk, ice cream, skim milk powder, and butter.

NEMO® pump



22