BRIKESH
ENGINEERING

Manufacturer of
Dairy Process Equipments & Projects

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MILK PASTEURIZATION

Fresh milk produced from healthy milch animals generally contains minimum load of microorganisms. In the course of handling at the farm, milk is liable to be contaminated by various microorganisms mainly bacteria. Rapid chilling to below 4°C temperature slows down the growth of microorganisms in the milk. Milk must be treated by an established process so that all pathogenic microorganisms are killed before it is consumed as fluid milk. This is achieved by heat treatment.

Pasteurization is one of the most important heat treatment processes. The term as applied to market milk refers to the process of heating every particle of milk to a temperature of atleast 63°C (145.4°F) for 30 minutes or 71.7°C (161°F) for 15 seconds (or to the temp-time combination which is equally efficient) in properly designed equipment. Milk is immediately cooled to 4°C and stored in Cold storage maintained at 4+1 Deg C.

As per definition of International Dairy Federation (IDF) "Pasteurization is a process applied to a product with an objective of minimizing possible health hazard arising from pathogenic microorganisms associated with milk by heat treatment, which is consistent with minimal chemical, physical and organoleptic changes in the product" The heat treatments suggested by the IDF for the pasteurization of milk are 15 seconds at 71.7°C=161°F or 30 minutes at 62.8°C=145°F can be regarded as "universal" reference treatments. Three aspects emerging from the definition are: (i) level and degree of heat treatment, (ii) minimum chemical, physical and organoleptic changes, and (iii) minimum health hazards. These are elaborated here.

TIME-TEMPERATURE COMBINATION

The time-temperature combinations normally used for pasteurization of fluid milk are as follows:

- 63°C (145.4°F) and held at that temperature for atleast 30 minutes
- 72°C (161.6°F) and held at that temperature for atleast 15 seconds.

The milk is then immediately cooled to a temperature not greater than 4°C. The selected heat treatment shall be applied only once. This means pasteurization includes heating to a specific time-temperature combination followed by immediate cooling to 4°C.

PURPOSE

Milk is pasteurized for two purposes:

- To make safe for human consumption by destroying pathogenic microorganisms present in milk.
- To improve its keeping quality.

The most heat resistant pathogenic organism at pasteurization temperature is the Mycobacterium tuberculosis and hence this has been made as an index organism to achieve complete safety of milk. Any heat treatment, which will destroy this organism, can be relied upon to destroy all other pathogenic organisms as well as other organisms involved in milk spoilage. Some bacteria, call thermodurics (heat resisting) may survive during pasteurization but immediately cooling slows down their growth and thus prevents them causing spoilage such as flavour taint or souring. Although, the main purpose of heat treatment is to destroy all microorganisms capable of causing disease in humans but pasteurization has

two additional benefits,i.e. the destruction of a large number of spoilage microorganisms present in raw milk and deactivation of some natural enzymes like lipases, which can adversely affect the quality of manufactured products, i.e. lipolysis or breakdown of fat into glycerol and free fatty acid. However, we must be clear that pasteurization is not a substitute for cleanliness during milk production. The pasteurization process should only be applied to raw milk obtained from healthy milch animals which is clean, sweet and has a low bacterial count.

HOMOGENIZED MILK

United State Public Health Service has proposed one of the most comprehensive definitions for homogenized milk. This has been the most widely accepted and referred definition. It states that "Homogenized milk is milk which has been treated in such manner as to ensure break-up of the fat globules to such an extent that after 48 hours of quiescent storage no visible cream separation occurs in the milk and the fat percentage of the milk in the top 100 ml of milk in a quart bottle (946ml),or of the proportionate volumes in containers of other sizes, does not differ by more than 10 per cent of itself from the fat percentage of the remaining milk as determined after thorough mixing.

SEPARATION OF MILK

We have studied that milk contains fat and non-fat constituents, also called solids-not-fat (SNF). Fat is present as globules whereas the SNF form an ionic solution(e.g. certain salts), true solution (e.g. lactose and whey proteins), or a colloidal solution (e.g. casein micelles) in the water part of milk. Thus, milk represents an emulsion in which the relatively large fat globules are dispersed in the continuous aqueous phase (serum). Since fat globules are lighter as compared to other solids, they tend to readily separate out from the serum (or skim milk), as can be seen in the formation of a 'cream' layer on the top of milk held undisturbed in a container for a few hours. Cream is that portion of milk, which is rich in milk fat, but poorer in SNF. This suggests that much of the fat can be easily separated in the form of cream from milk, leaving behind the skim milk containing very little fat. Cream separation enables the processor to manufacture a variety of fat-rich dairy products such as cream of various types, butter, ghee, etc. Cream separation also makes it possible to adjust the composition of milk with respect to its fat and SNF contents. Such compositional modification (vide Sec) may be desired for products manufacture as also for meeting the legal requirements of different types of fluid milk.

Two methods of separation of cream from milk are commonly used: (i) gravity separation and (ii) centrifugal separation. Both these methods rely on the basic principle of separation of two immiscible liquids having different densities, under the influence of gravitational or centrifugal force.

DAHI / YOGURT

Process on the basis of scientific lines has been developed for dahi making in the organized sector. Fresh, sweet, good quality milk is received, pre-heated and subjected to filtration and clarification. The milk is standardized to 2.5 to 3.0 percent fat and 10 percent solids not fat, pre-heated to 60 Deg C and homogenized single-stage at a pressure of 176-kg/sq cm. The milk is heated to 85– 90 Deg C for 15-30 minutes, cooled to 22-25 Deg C and inoculated with 1-2 percent of specific dahi starter culture. It is then filled in suitable packaging containers of the appropriate size and incubated at 22-25 Deg C for 16-18 hours. After proper setting of the dahi, the acidity of dahi reaches 0.6 to 0.7 percent and a firm curd is formed. The curd is cooled by circulating chilled water or air around the containers and then transferred to cold room maintained at about 4-5 Deg C.

PANEER

Paneer refers to the milk product obtained by the acid coagulation of hot milk and subsequent drainage of whey. The acids commonly used are citric, lactic, acetic, etc. phenomenon of coagulation involves the formation of large structural aggregates of proteins in which milk fat and other colloidal and soluble solids are entrained with whey.

CREAM

Cream is defined as the fat rich portion of milk obtained by gravity or mechanical method of separation. It is the light weight portion of milk which still contains all the main constituents of milk but in different proportions. The fat content of cream varies widely in the range of 20- 80 % depending upon the method of separation. Two indigenous products, which resemble cream in certain respect, are Malai and Sar. These products are prepared by skimming fat during boiling of milk or from boiled milk during cooling. Malai is obtained by hand skimming of heated and cooled milk.

BUTTER

Butter is the product obtained from cow or buffalo milk or a combination thereof or from curd with or without the addition of any preservatives including common salt, any added colouring matter or flavouring agents. It shall be free from other animal fat and shall contain not less than 76 per cent of milk fat by weight

GHEE & BUTTER OIL

Ghee: Ghee may be defined as heat clarified butterfat prepared from cow or buffalo or sheep or goat milk or their mixtures and having characteristic cooked or acidic flavour and grainy texture.

Butter oil : It may be defined as clarified butterfat and normally having bland or flat flavour. The grains are either absent or under developed in it.

CHEESE

Cheese is a fermented dairy product. Fermentation has occupied a place of pride in food preservation practice from time immemorial. It improves and enhances the nutritional value and enriches flavour, texture and rheology of the product. Fermented milk products have been reported to have therapeutic, anticholesterolemic, anticarcinogenic antihypertensive and anticariogenic properties. Cheese, as a delightful fermented food contributing to a variety in our diets, has been recognized to provide important nutrients and considered superior to non-fermented dairy products in terms of nutritional attributes as the microflora present produce simple compounds like lactic acid, amino acids and free fatty acids that are easily assimilable.

REFRIGERATION

Refrigeration means production of cold, i.e., to bring and maintain the temperature of an enclosed space below that of its surroundings. This enclosed space can be a refrigerator cabin or deep freeze cabin or cold storage, etc. that is being used to store food/ dairy products at low temperature. It can also be an air-conditioned room or building where low temperature of air is required for human comfort. In this way, refrigeration has very wide applications such as food preservation in domestic as well as in food/dairy industries, ice-manufacturing, ice cream manufacturing, textile industries, air conditioning of buildings, transport air conditioning, liquidification of gases, research and medical applications, etc. We are familiar to these different uses of refrigeration.

WEIGH BOWL

Application : Weigh bowl is required for weighing of milk which received in can at milk receive area.

Construction : Rectangle/square horizontal vertical design, hanger supported, Gradient bottom, suitable for manual cleaning, crevices free sanitary design.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr & 2,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

DUMP TANK

Application : Dump tank is required for collecting and transfer the milk which is going for further milk process after weighing.

Construction : Rectangle/square horizontal vertical design, leg supported, Gradient bottom, suitable for manual cleaning, crevices free sanitary design.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr & 2,000 Ltr.

MOC : SS 304 / SS 304L SS 316 / SS 316L

Finish : Matt / Mirror

MILK SILOS

Application : Silos are required for storage of milk and other milk products for further process or after process completion.

Construction : Cylindrical vertical design, inclined bottom, top conical closer, suitable insulation is provided with stainless steel welded cladding, skirt / structure supported, suitable for CIP, Crevices free sanitary design.

Capacity : 5,000 Ltr, 10,000 Ltr, 15,000 Ltr, 30,000 Ltr, 40,000 Ltr., 60,000 Ltr. & 1,00,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

BALANCE TANK

Application : Balance tank is required to receive & maintain the raw milk constant supply during pasteurization process.

Construction : Cylindrical vertical design, Flat top & bottom closer, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 100 Ltr, 200 Ltr & 150 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

CREAM STORAGE TANK

Application : Cream storage tank is required for storage the pasteurized cream

Construction : Cylindrical vertical design, conical top & bottom closer, dimple jacket with suitable insulation is provided alongwith stainless steel welded cladding, Leg supported, suitable for CIP, Crevices free sanitary design.

Capacity : 2,000 Ltr, 3,000 Ltr, 5,000 Ltr, 8,000 Ltr. & 10,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

PASTEURIZED MILK STORAGE TANK

Application : Pasteurized milk storage tank is required to store the pasteurized milk or milk products

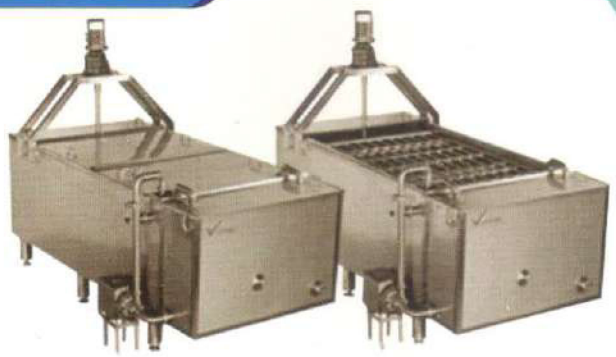
Construction : Cylindrical horizontal design, both side conical end closer, suitable insulation is provided with stainless steel welded cladding, Leg supported, suitable for CIP, Crevices free sanitary design.

Capacity : 5,000 Ltr, 10,000 Ltr & 15,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

BUTTER MELTING VAT



Application : Butter melting vat is required for melting the butter with uniform heating and avoide excess heating.

Construction : Rectangle/square horizontal vertical design, open top, gradient bottom, hot water circulation coil, insulated with stainless steel cladding, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr & 2,000 Ltr. & 3,000 ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

BUTTER CHURNER

Application : The objective of churning is to produce butter. During churning continuous agitation of cream destabilizes the oil-in-water type emulsion of cream, the emulsion breaks and butter grains are formed. The cream used for churning should possess good churn-ability. It means that it should produce sufficiently firm grains of butterfat easily and completely in optimum time (35-45 min). In short churn-ability of cream refers to the ease, completeness and duration of churning to produce sufficiently firm grains of butterfat, which can easily be washed.

Construction : Cylindrical horizontal design, dished end type both side closer, rotary circulation is provided with suitable geared motor, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 200 kg, 500kg, 1,000 kg & 1,500 kg

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

GHEE CATTLE / BOILER

Application : Ghee cattle / boiler is required to prepare the ghee from cream / butter with help of steam or other heating media.

Construction : Cylindrical vertical design, hemispherical bottom dished end and flat hinged top closer, jacket with suitable insulation is provided alongwith stainless steel welded cladding, low speed stirrer is provided, Leg supported, suitable for CIP, Crevices free sanitary design.

Capacity : 250 Ltr, 500 Ltr. & 1,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

CHEESSE MELTING VAT

Application : Cheese melting vat is required for culturing & coagulation process.

Construction : Rectangle/square horizontal vertical with oval shape ends design, open top, flat gradient bottom, hot water circulation coil, insulated with stainless steel cladding, provided with top entry rotary with horizontal movable stirrer, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr, 2,000 Ltr. & 3,000 ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

PANEER PREPARATION TANK

Application : The heating and coagulation of milk is or heated milk directly take in paneer preparation tank done in a stainless steel tank, a drain-valve is provided to drain whey after coagulation.

Construction : Rectangle/square horizontal vertical design, open top, gradient bottom, hot water circulation coil, insulated with stainless steel cladding, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 500 Ltr & 1,000 Ltr

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

DAHI / CURD / YOGHURT PROCESS TANK

Application : Dahi / Yoghurt process tank are required to process & preparation of curd milk.

Construction : Cylindrical vertical design, conical / dished end type top & bottom closer, limpet coil with suitable insulation is provided along with stainless steel welded cladding, low / high speed stirrer are provided, Leg supported, suitable for CIP, Crevices free sanitary design.

Capacity : 1,000 Ltr, 1,500 Ltr, 2,000 Ltr & 3,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

STERILAZER

Heat sterilization : Although the refrigerated shelf life improves markedly by the various treatments given to raw paneer, the shelf life at room temperature does not improve noticeably. Heat sterilization of paneer is an effective treatment for improving its shelf life at room temperature. Paneer packed in tins along with water/ brine and sterilized in an autoclave at 15 psi for 15 min lasts for 4 months. The perception of an oxidized flavour renders the product unacceptable afterwards. A slight amount of cooked flavour accompanied by maillard browning, the intensity of which increases slightly during storage, is noticed.

Construction : Cylindrical horizontal design, welded dish ends to shell, non jacketed, suitable insulation is provided along with stainless steel welded cladding, saddle supported, Crevices free sanitary design, fully auto and provided with PLC panel

MOC : SS 304 / SS 304L / SS 316 / SS 316L
Finish : Matt / Mirror

BULK MILK COOLER

Application : Bulk milk cooler is ideal for storage and maintain the raw milk quality.

Construction : Cylindrical horizontal design, welded flat ends to shell, jacket with suitable insulation is provided along with stainless steel welded cladding, Suitable low speed agitator is provided at top, Leg supported, suitable for CIP, Crevices free sanitary design, Suitable refrigeration unit is provided at outside.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr, 2,000 Ltr, 3,000 Ltr, 5,000 Ltr & 10,000 Ltr
MOC : SS 304 / SS 304L / SS 316 / SS 316L
Finish : Matt / Mirror

MILK TANKER

Application : Milk tanker is required to store and transfer the bulk milk from one place to another place.

Construction : Cylindrical / elliptical horizontal single or multiple compartment design, welded flat ends to shell, suitable insulation is provided along with stainless steel welded cladding, skirt supported, suitable for CIP, Crevices free sanitary design.

Capacity : 8,000 to 8,500 Ltr & 12,500 to 13,000 Ltr.
MOC : SS 304 / SS 304L / SS 316 / SS 316L
Finish : Matt / Mirror

MAWA CATTLE

Application : Mawa cattle / boiler is required to prepare the mawa from milk with help of steam or other heating media.

Construction : Cylindrical vertical design, bottom dished end and open top, jacket with suitable insulation is provided along with stainless steel welded cladding, low speed stirrer is provided, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 200 Kg.
MOC : SS 304 / SS 304L / SS 316 / SS 316L
Finish : Matt / Mirror

BASUNDI CATTLE

Application : Basundi cattle / boiler is required to prepare the basundi from milk with help of steam or other heating media.

Construction : Cylindrical vertical design, bottom dished end and open top, jacket with suitable insulation is provided along with stainless steel welded cladding, low speed stirrer is provided, Leg supported, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 200 Kg.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

MAWA PAN

Application : Mawa pan is required to prepare the mawa from milk with manual agitation alogwith steam or other heating media.

Construction : Cylindrical vertical design, bottom hemispherical dished end and open top, jacket with suitable insulation is provided along with stainless steel welded cladding, suitable for manual cleaning, Crevices free sanitary design.

Capacity : 100 Kg.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

ICE CREAM AGING TANK

Application : Ice cream aging tank is required for additives preparation during process as required.

Construction : Cylindrical vertical design, conical ends type top & bottom closer, dimple jacket with suitable insulation is provided along with stainless steel welded cladding, low speed stirrer are provided, Leg supported, suitable for CIP, Crevices free sanitary design.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr
2,000 Ltr., 3,000 Lt,r & 5,000 Ltr

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

ICE BANK TANK

Ice Bank : The ice bank is a widely used for fast cooling of milk. This method of cooling reduces the size of the refrigeration compressor (hence, power requirement) by building up a reserve of ice over a long period. In ice bank, cooling is done through a plate heat exchanger or a surface type cooler with chilled water being the cooling medium. The chilled water is pumped from the ice bank through the heat exchanger and back to the ice bank. Ice banks have considerable flexibility in size and range from a small, self-contained portable unit to a large, using a multiple ammonia compressors, water condensers and associated cooling tower

Powder mixer tank

Application : Powder mixing tank is required to mixing with additives during process as required

Construction : Cylindrical vertical design, conical ends type top & bottom closer, limpet coil with suitable insulation is provided along with stainless steel welded cladding, low speed stirrer is provided, Leg supported, suitable for CIP, Crevices free sanitary design.

Capacity : 500 Ltr, 1,000 Ltr, 1,500 Ltr & 2,000 Ltr.

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

Butter Trolley

Butter prepared in the churn requires unloading. Hence, a hygienically designed stainless steel open type trolley is required. The size of trolley should be such that it should accommodate all butter from the churn. If the quantity of butter made is less, one may collect butter in other containers, provided they are clean and designed to handle food products.

Capacity : 500 KG 1,000 KG

MOC : SS 304 / SS 304L / SS 316 / SS 316L

Finish : Matt / Mirror

Paneer Hoops - Moulds

Used for holding the curd in preparation for pressing the curd and shaping the finished paneer, Stainless steel is used for fabrication of moulds.

Capacity : 5 KG & 10 KG

MOC : SS 304 / SS 304L
SS 316 / SS 316L

Finish : Matt / Mirror

Paneer Press

The press consist the single / multiple set of pneumatic cylinder as required, each cylinder can press the 3 nos of paneer hoops, the press is provided with suitable electrical panel

CLEAN-IN-PLACE (CIP) CLEANING SYSTEM

It is a process that combines high velocity scrubbing and chemical actions of the circulating detergent solutions to remove the deposits from milk handling equipment. The clean-in-place (CIP) system of cleaning eliminates the dismantling and reassembling process for the equipment for the cleaning purposes. This reduces the human effort involved and economizes on labour, time and energy.

The CIP System consists of storage tanks for water, alkali and acid detergents, pumps and interconnecting pipelines for solutions. Pressure jets, perforated spray balls are employed in conjunction with CIP system for creating effective turbulence for proper cleaning of storage tanks

Storage tanks have the provision for heating of the solutions. Equipment to be cleaned is connected with this system and different solutions are circulated through the equipment for a definite period of time in a sequence decided as per the cleaning cycle. The time of circulation, temperature and the concentration of cleaning solutions and the turbulence required for physical action depend upon the Type of deposits in the equipment.

Addition of higher amount of detergents or unnecessary increasing the cleaning time does not remove additional deposits from the surface. Also sometimes higher temperatures of detergent solutions may fix the deposits more firmly on the milk process equipment.

The detergent solutions are reused as many times as possible. The concentration of the detergents is constantly monitored. For conservation of water, an additional tank is provided which collects the final rinsed water, which is used for pre rinse in the next cleaning operation.

CLIENT LIST

- Apple Dairy
- Atman Solutions Pvt. Ltd.
- Bajrang Dairy
- Bharat Dairy
- Blueberry Industries
- Mehasana Dairy
- Milky Milk Processor
- Navrang Dairy
- Pathvimeda Dairy
- Ramdev Food Products Pvt. Ltd.
- Sheetal ice-cream
- Sumiran Food
- Sharad Dairy
- Umiya Dairy
- Vimal Dairy