

Equipments Used In Milk Reception



Contents

- 1** Introduction
- 2** Factors affecting Equipments Designing & Installation
- 3** Equipments
- x** About PMG Engineering

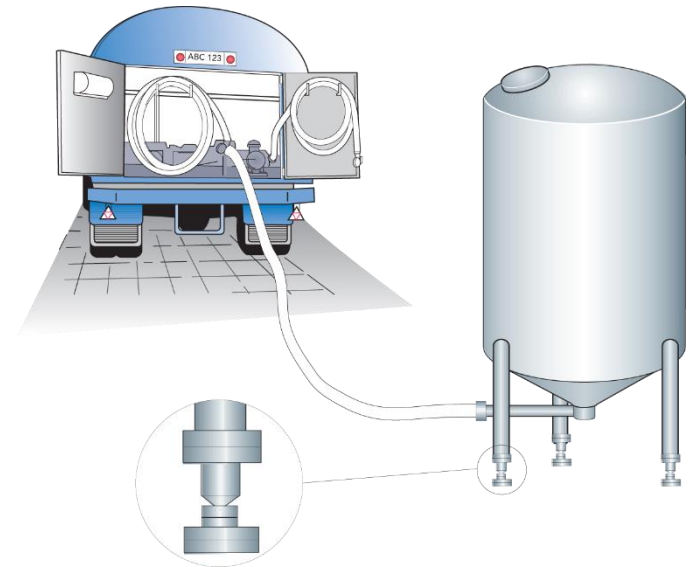
1. Introduction

- Milk received either in cans or in tankers Raw Milk Reception Dock.
- Dairy reception dock is specially designed and equipped,
 - to facilitate **rapid reception** of milk and, cleaning and sterilization of used containers.
- Equipment at milk reception designed so that intake operations are expedited, particularly where large volumes of milk are received.
- Layout at the reception dock and equipment placement is done for obtaining the maximum efficiency at the minimum cost.



2. Factors affecting Equipment Designing

- **Health regulations:** Prior to the start of construction, the project needs formal written approval and interaction with the local health authorities during the preliminary design phase.
- **Volume of milk:** The reception platform must be spacious enough to accommodate the required number of milk can lorries and tankers, considering seasonal variations in milk availability.
- **Floor space:** Proper milk inspection and handling of rejected cans should be done with adequate space and equipment, avoid proximity or proximity to walls or ceilings. Emptied cans and lids should be properly washed and returned to the truck.



2. Factors affecting Equipment Designing

- **Methods of delivery of milk:** The layout of platforms and equipment, including conveyors at the reception dock, is crucial for efficient milk delivery. Truckers should discharge cans at the intake point before picking up empties, and the combined capacity of the intake, washer, and discharge conveyors should be sufficient.
- **Location of driveways and vehicle yards:** Streets, driveways and yards for the vehicles must be located suitably in relation to the receiving dock.
- **Elevation of dock:** The level of the truck and receiving platform should be the same.

3. Equipments

3.1 Conveyor:

- Efficient materials handling requires conveyor systems that provide direct, continuous flow from origin to destination, ensuring simplicity, flexibility, and trouble-free operation.
- It should have proper elevation at all points, and easy to clean, lubricate and maintain. Sharp curves, sudden changes of elevation switching of various size packages and other tasks can be handled without difficulty
- It permits inspection, grading, sampling of milk. It conveys milk can from one end of platform to tipping point.
- It can be power driven gravity roller type.



3. Equipments (Cont.)

3.2 Can Tipping Device:

- It is floor mounted horizontal aluminum crossbar supported on two legs
- Used for manual tilting and unloading of milk to weigh bowl.
- The leg shall be made of SS Pipe.



Can Tipping Device

3.3 Weigh Scale/ bowl /tank/ weighing Machine:

- it is a stainless-steel bowl attached to circular dial weigh scale.
- May be fitted with automatic weigh recorder.



Weigh Scale/bowl/tank

3. Equipments (Cont.)

3.4 Can Rinsing and Steaming Block:

- It is Pedal Operated Equipment for rinsing and sterilizing cans.



3.5 Sanitary Milk Pump: Typically, stainless-steel centrifugal pump which pumps milk from dump tank.



3. Equipments (Cont.)

3.6 Dump Tank:

- A rectangular vessel used as a balance tank for milk between a weigh bowl and a milk chiller in dairy industries.
- Sturdy and hygienic, capable of storing large amounts of liquid.
- These tanks are used in conjunction with conveying systems or individually for small chilling centers or bulk milk cooling centers.
- They have an outlet at the flat bottom with a slop for easy liquid drain and are mounted on adjustable ball feet.



3. Equipments (Cont.)

3.7 Drip Saver: Drip Saver is used for the removal of excess water or milk residue in the drained Milk cans. It has tubular with rack arrangement.

3.8 Can washer: The smaller capacity ones are Rotary can washers, whose capacity is 3 to 5 cans/min, while the larger capacity ones are Straight-through can washers, whose capacity is about 12 cans/min. It is used to clean wash and sterilize cans.

3.9 Can Washing Trough: It is a semi-circular manual cleaning basin provided with scrubbing brush, which is used to scrub and clean cans.



Drip Saver



Can washer



Can Washing Trough

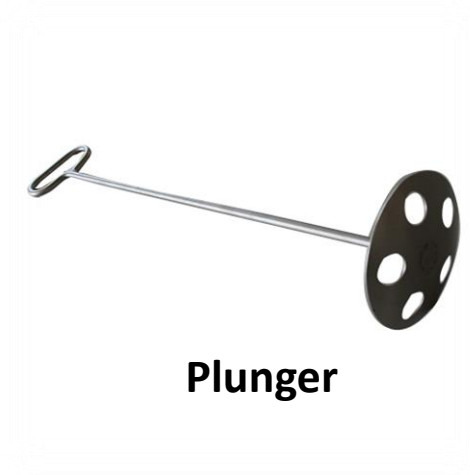
3. Equipments (Cont.)

3.10 Draining Rack: It is either Roller Roller type conveyor or rotary rack which is used to drain and dry clean milk cans and lids.

3.11 Sanitizing Assembly: it consists of 3 parts: steaming block, pump spray and sanitizing solution tank which is used to sanitize tank.

3.12 Plunger: It is manual stirrer made up of stainless steel or aluminium which stir milk in can or vat for grading and sampling.

3.13 Testing kit: It consists of sampler, sample bottle, test tubes etc. These are used to accomplish platform tests.



Plunger

3. Equipments (Cont.)

3.14 Jacked Vat / Tank :

- For batch cooling especially of small quantities.
- It consists of a tank within a tank, with the space between the two being used for circulation of the cooling medium, by either pump or main pressure.
- An agitator is provided to move the milk (which is in the upper tank) for rapid cooling.



3. Equipments (Cont.)

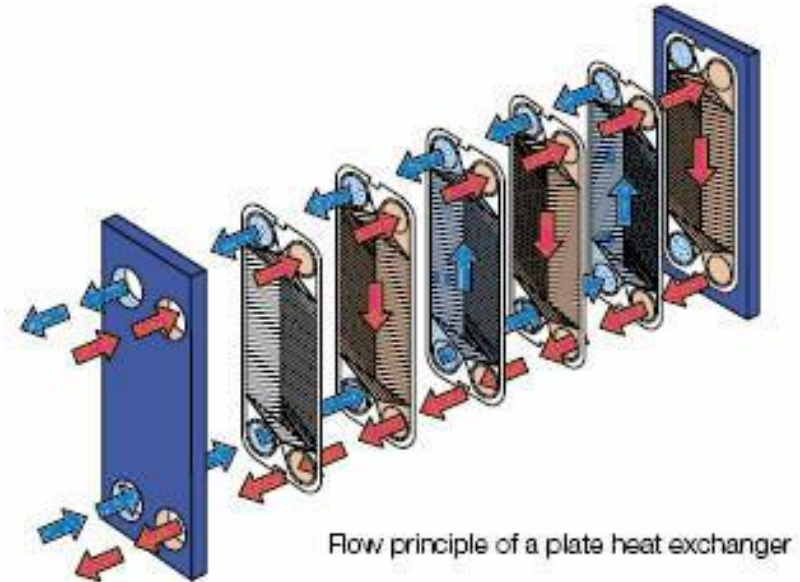
3.15 Surface Coolers:

- A series of small diameter horizontal tubes are welded one above another terminating in a header at each end.
- The header connects the tubes together for series of parallel flow.
- The cooling operation may be completed in two or more stages by mounting one unit above another.
- Milk is distributed over the coil by means of distribution pipe or trough and the milk drops from the lower coil into a collection trough, from which it is removed by gravity or pump.
- The cooling medium flows through the coil.
- There are units available, called cabinet or fan type coolers in which two or more surface type coils are used served by common distributor and collecting troughs, and one mounted within a cabinet having hinged doors.

3. Equipments (Cont.)

3.16 Plate Cooler:

- For continuous cooling.
- Commonly used in the dairy industry, especially for large scale handling.
- Consists of several thin, flat, grooved, stainless steel plates, sealed at the edges with a gasket and clamped tightly within a press.
- The spaces between the plates are occupied alternatively by the milk and the cooling medium (chill water / brine),
- Thus, one side of each plate is exposed to milk and the other side to the cooling medium. Plates may be added to provide increased capacity at nominal cost.



3. Equipments (Cont.)

3.17 Can cover Loosener or opener: It opens or loosens the lid from the cans which is placed in the conveyor line after pre washer or immediately after unloading from vehicle.

3.18 Ventilation Duct : it is installed near ceiling to remove fumes, air, etc from reception dock.

3.19 Compressed Air Arrangement: connected to the top of tanks to empty the tanker under air pressure.



Can cover Loosener



Ventilation Duct

3. Equipments (Cont.)

3.20 Sanitary Piping: It convey milk from tankers to storage tanks which is generally made up of stainless steel.

3.21 Weigh bridge: Weigh bridge is a large set of scales, usually mounted permanently on a concrete foundation, that is used to weigh entire rail or road vehicles and their contents. By weighing the vehicle both empty and when loaded, the load carried by the vehicle can be calculated.

3.22 Pre- Washer: it fits into conveyor lines which wash the exterior of milk cans before dumping.

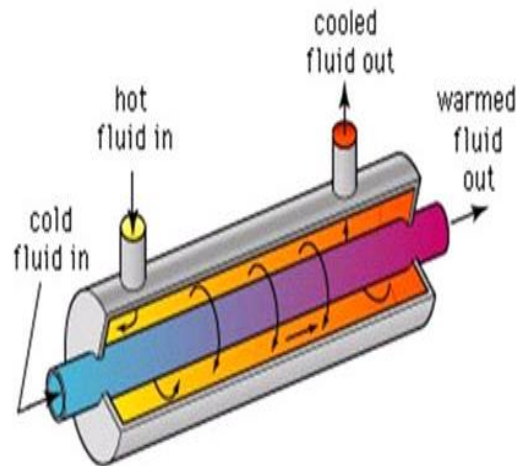


Weigh bridge

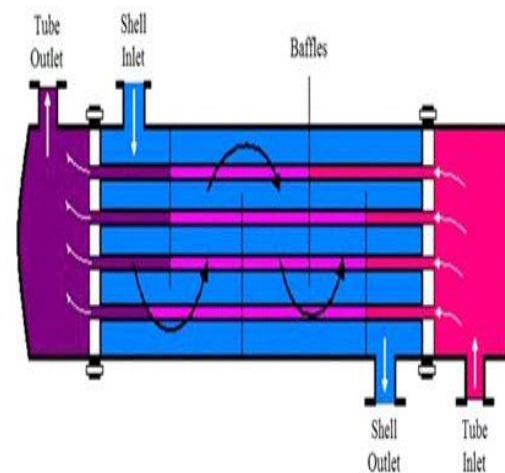
3. Equipments (Cont.)

3.23 Internal Tabular Cooler:

- For continuous cooling.
- It consists of a stainless-steel tube about 2.5 to 5.0 cm in diameter surrounded by a similar tube, forming a concentric cylinder.
- Several such tubes may then be connected in series to obtain sufficient cooling. The cooling medium flows counter to the milk flow.



Concentric Tube type Heat Exchanger



Shell and Tube type Heat Exchanger

3. Equipments (Cont.)

3.24 Milk silo:

- Usually of the capacities of 50,000-100000 tonnes.
- They can hold large amount of product in less area.
- Other considerations are:
 - Bottom slope 6%.
 - Control panel to show temperature, pressure, etc.
 - Electrode at the drainage line to indicate when tank becomes empty.



PMG Engineering Private Limited

The End-to-End Engineering Company in Food Industry

info@pmg.engineering | www.pmg.engineering



We deliver End-to-End Engineering Design and Construction Management Projects in Food and Beverage Industry.



Meeting Global Benchmarks

In ENGINEERING DESIGN and PROJECT MANAGEMENT
for FOOD and BEVERAGE Industry with SINGLE POINT ACCOUNTABILITY

Process Engineering | Project Management | Mechanical | Electrical | Automation | Food Safety

PEOPLE DELIVERING RESULTS

Safe-by-choice. First Time Quality. Maximize Value. Objectivity.
Ownership. Reliable and Trustworthy Business.

Our Clients



Build World-Class Food Factories