

GHEE PLANT

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

DESIGN & ENGINEERING BY

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GHEE MAKING PROCESS

Ghee is animal fat normally produced from Milk. Following are the step taken during ghee making process.

1. During pasteurization process milk cream is separated in the cream separator with 50 – 70 % fat content. (These equipments are not in our scope of supply.)
2. This cream is then churned in butter churn. This makes butter of 84 % fat. The whey is drained in whey tank, which is used as by product. (These equipments are not in our scope of supply.)
3. Butter from the butter churn is taken in the butter trolley. (These equipments are not in our scope of supply.)
4. This butter either can be stored in the cold room, till sufficient butter is available for further processing. (These equipments are not in our scope of supply.)
5. Once sufficient butter is available, it is taken in the Ghee Kettle.
6. Open the condensate drain valve and remove all the condensate from the steam jacket.
7. Steam valve in the ghee kettle is opened slowly and start supplying steam (1.5 bar G.). This is to heat the butter and melt it.
8. Close the drain valve and open steam trap and let condensate pass through it.
9. Once enough butter is melted, start the agitator of the ghee kettle.
10. Continue supplying steam to the kettle.
11. The butter oil will start boiling and water from the butter will evaporate.
12. Let all the water evaporate.
13. Close slowly the steam supply valve and open vent valve on the jacket.
14. Let all condensate from the steam jacket get drained.
15. Let ghee to cool down.
16. Continue agitating ghee with the help of agitator.
17. After ghee temperature has come down to around 70 Deg C, drain this in the ghee filter tank.
18. With the help of SS strainer, most of burned protein from the butter is filtered out.
19. Once all ghee is filtered, start the ghee pump.
20. The ghee should be fed to ghee clarifier, where ghee will be clarified.
21. The clarified ghee is collected in the balance tank.
22. Ghee from the balance tank, with the help of another ghee pump is transferred to jacketed ghee storage tank.
23. This storage tank has water jacket with electric heater. In case of very cold weather, switch on the electric heater. This is to keep ghee in free flowing condition.
24. This is final product. Pack ghee in consumer packing. (These equipments are not in our scope of supply.)
25. Clean the complete plant from inside and outside with warm detergent followed with water and wipe out all traces of butter / ghee.
26. Clean all pipes / valves.

EQUIPMENT SPECIFICATIONS AND DESCRIPTIONS

A. Ghee Kettle.

A.1 Description

This is three jacket, fabricated from SS 304 material. The inner jacket is closed, by hemispherical dish from the bottom and top is covered. The plate thickness is selected to suit pressure. The volume of the vessel is 500 ltr.

The outer jacket is steam jacket. This is fabricated from SS material. This jacket has, steam inlet, condensate outlet, and safety valve connection. The steam is distributed in the jacket with the help of pipe.

The kettle is then insulated by glass wool insulation and finally cladded with SS sheet.

The following attachment and accessories are included,

- Scrapper type ghee agitator.
- Plug type ghee outlet valve.
- Ghee temperature indicator.
- Steam inlet valve and pressure indicator.
- Steam trap with isolation and by pass valve.
- Steam jacket safety valve.
- Legs support.
- Top cover.

A.2 Installation

See attached layout plan. The height of the roof under this must be 4 mtrs. The place should be well ventilated to remove water vapors, which is generated during ghee making process. The front should be clear. The butter loading is done from the front of the kettle.

A.3 Routine Maintenance.

1. After using kettle, drain completely the steam jacket.
2. Keep vent valve open, when system is not in use.
3. Clean the kettle with detergent from inside and outside.
4. Check agitator and remove any dirt on the shaft.
5. Check all valves for any leakage and stop it.

B. Ghee Sieve Tank.

B.1 Description

This is tank fabricated from SS 304 material. This has SS strainer at the top to filter ghee. The following attachment and accessories are included,

- SS strainer
- Plug type ghee outlet valve.
- Legs support.
- Top cover.

B.2 Installation

See attached layout plan. It should be kept near the ghee kettle. The pipe with valve is provided along-with the ghee kettle.

B.3 Routine Maintenance

1. After using tank, drain completely.
2. Clean the tank with detergent from inside and outside.
3. Check all valves for any leakage and stop it.

C. Ghee Pump

C.1 Description

This is hygiene design centrifugal pump, manufactured from SS 304 material. Please refer attached manufacturer manual.

C.2 Installation

See attached layout plan. It should be kept near the ghee kettle.

C.3 Routine Maintenance

Refer attached manual.

D. Ghee Clarifier

D.1 Description

This is high speed centrifuge, used to clarify ghee. This will remove all material from the ghee and clarified ghee will be dispensed in the balance tank. Please refer attached manufacturer manual.

D.2 Installation

See attached layout plan. This must be anchored with the help of foundation bolts. Refer manufacturer manual for proper installation of the clarifier.

D.3 Routine Maintenance

Refer attached manual.

E. Ghee Balance Tank

E.1 Description

This is fabricated from SS 304 material and have following accessories.

Ball feet legs

Outlet Valve

Cover

E.2 Installation

See attached layout plan.

E.3 Routine Maintenance

Clean the tank from inside & outside with warm detergent solution.

F. Ghee Storage Tank

F.1 Description

This is fabricated tank having water jacket. The jacket has electric heater with thermostat. The tank is fabricated from SS 304 material.

F.2 Installation

See attached layout plan.

F.3 Routine Maintenance

1. Drain water once in a week.

2. Fill only soft water.

3. Check electric heater and thermostat.

4. Clean the tank from inside and outside after usage.