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Pasteurization

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Outline

Introduction

- Batch process
- HTST Pasteurizer

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- Batch Process
  - Suitable for small capacity
  - involves heating to 60 ^{o}C and holding at that temperature for 30 min.
- Time taken for heating and cooling is given a

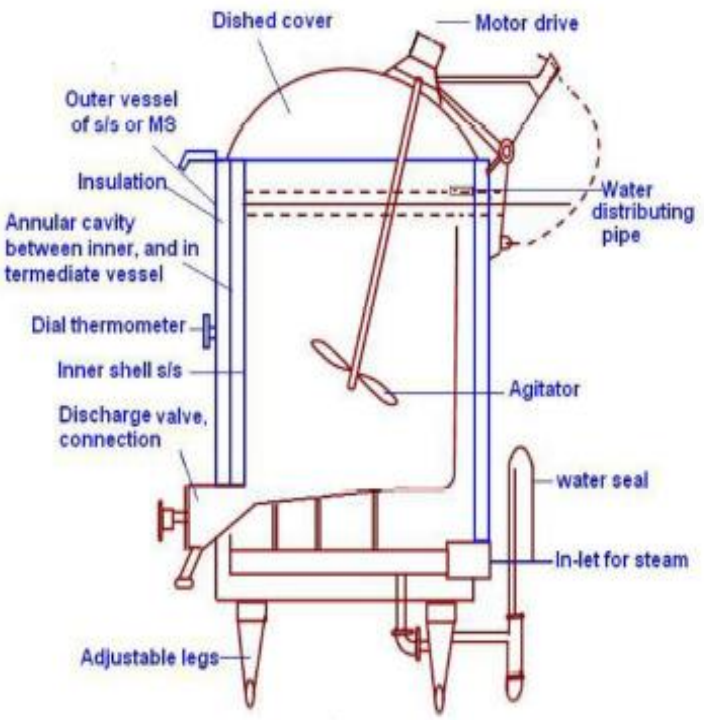

Fig.17.1 Batch pasteurizer

$$t_h = \frac{m.c}{A.U} \ln \frac{T_s - T_o}{T_s - T_m}$$

$$t_c = \frac{m.c}{A.U} \ln \frac{T_o - T_{cw}}{T_m - T_{cw}}$$

where, t_h, t_c = Time taken for heating or cooling respectively

m	= mass of milk
c	= Specific heat of milk
A	= Area of heat transfer
U	= Overall heat transfer co-efficient
T_o	= Initial temperature of milk
T_m	= Final temperature of milk
T_s	= Hot fluid temperature
T_{CW}	= Chilled water temperature

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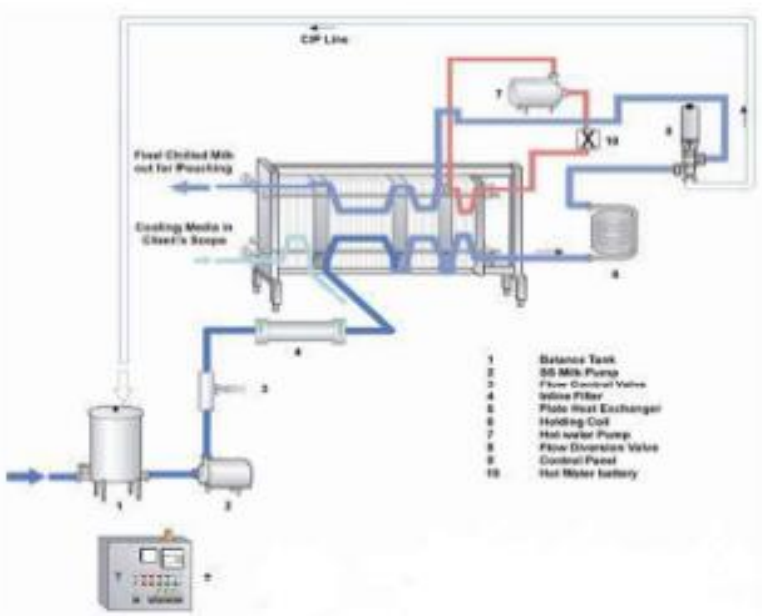
HTST Pasteurizer

- Have proved to be workhorses of processing in Dairy Industry
- For milk the time temperature combination used is 71.5 ^{o}C for 16 sec, and then immediately cooled to below 4 ^{o}C.



17.2 Schematic diagram of pasteurizer
Adopted from JMD Sonic Engg Ltd manual

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Plate heat exchanger (PHE)

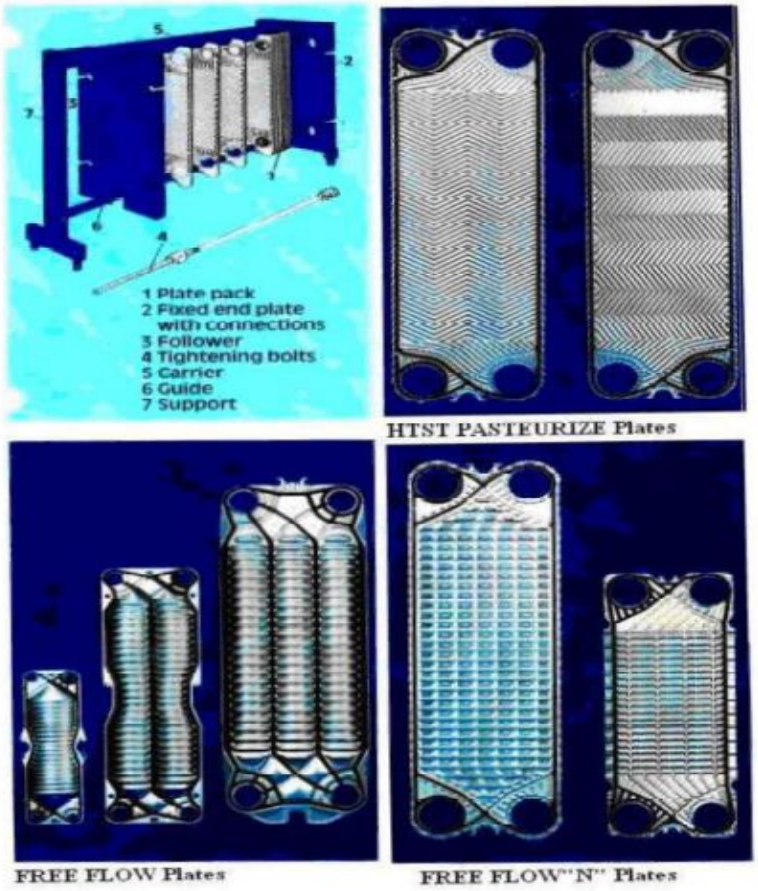

Fig.17.3 HTST pasteurizer
(Adapted from manual of GEA Ahlborn Gmbh &co)

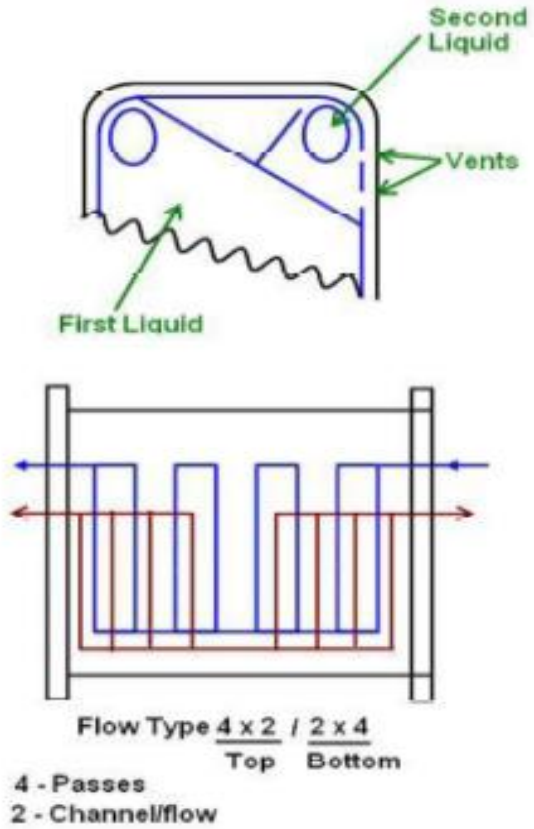

Fig.17.4 PHE

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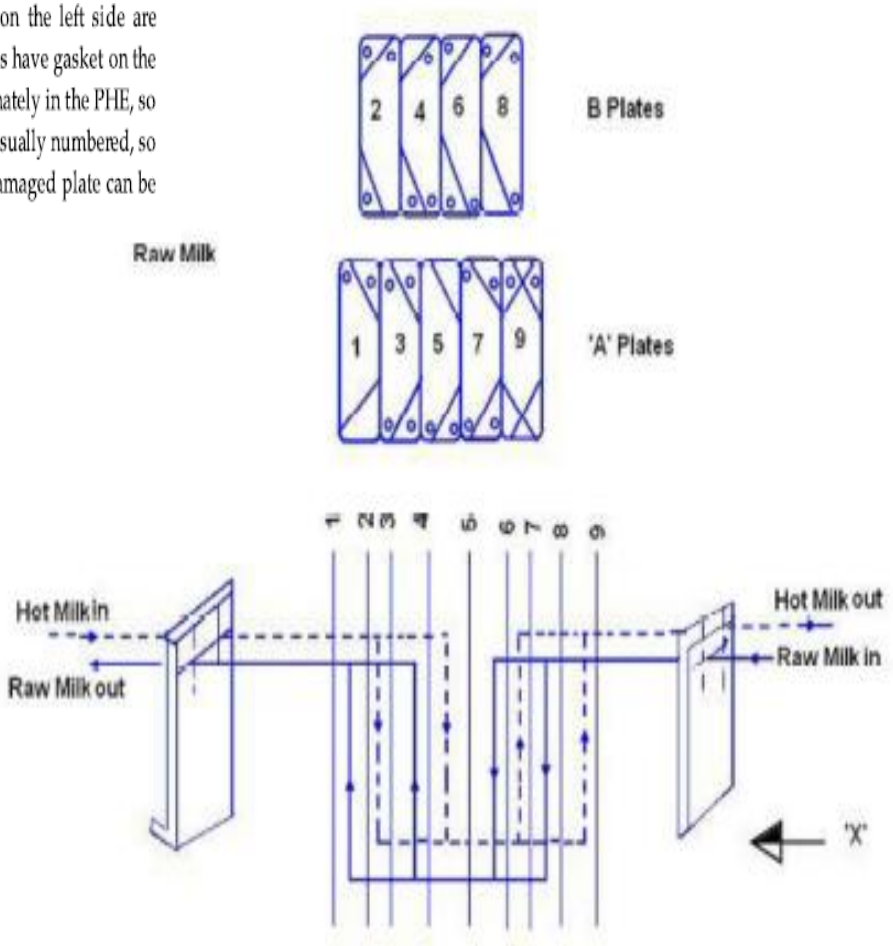
Plate connection diagram

In the connection diagram, the flows of liquid are shown. The flows drawn on the left side are running along A- plates and the flow on the right side over B-plates. The A-plates have gasket on the right hand side and B-plates have it on the left. The two types are arranged alternately in the PHE, so the process fluid and service fluid flow in the alternate channels. The plates are usually numbered, so as to make it easier in assembling, and relate to the connection diagram. Any damaged plate can be replaced by an identical spare plate.



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Thank you