

FILTRATION EQUIPMENT:

- One (1) Filtration Engineering Co., Inc. Ultrafiltration System for processing whole milk at a capacity 35,000 lbs/hour over 20 hour's operation per day. Feed temperature to be 40° F. The system will operate at a concentration ratio of 3:0:1; to produce concentrated whole milk at 25% solids.

Operation Parameters:

Feed: 35,000 lbs/hr of whole milk at 12% solids
Concentrate: 11,667 lbs/hr at 25% total solids
Permeate: 23,333 lbs/hr at 5.4% total solids.

Equipment Specifications:

- A. Three (3) Recirculation loops
Twenty (20) 6.3" 31 mil vexar membranes loop 1
Twenty (20) 6.3" 31 mil vexar membranes loop 2
Twenty (20) 6.3" 47 mil vexar membranes loop 3
C. Four (4) Elements per Vessel

Total elements sixty (60) 6.3" x 38" equal to 1,000 square meters of membrane area.

Feed System: 700 liter balance tank, enclosed tank with spray ball and 18" man-way with drain valve, level control, throttling valve, four (4) divert valves, one (1) temperature probe (pt-100), and includes a 4" four port flow plate, two (2) shut-off valves and one (1) throttle valve.

Sock Filter Bank: Four (4) sock filter canisters, four (4) shut off valves, two (2) pressure transmitters, (2) pressure gauges, one (1) stand for Filter bank.

System Pumps: (Fristam Pumps) One (1) centrifugal feed pump (25 hp), three (3) centrifugal stage recirculation pumps (25 hp), one (1) permeate transfer pump (7.5 hp), one (1) concentrate transfer pump 7.5 HP.

Concentrate Section: Consisting of a 400 liter enclosed balance tank with manway, CIP Spray ball, level control and temperature transmitter. One (1) transfer pump, (VFD required for this pump)

Permeate Section: Consisting of a 700 liter enclosed balance tank with manway, CIP spray ball, level control and temperature transmitter control. One (1) transfer pump. (VFD required for this pump), one (1) four port flow plate and two (2) divert valves.

Loop Section:

Three (3) recirculation loops

Three (3) pressure transducers to measure boost pressure.

One (1) centrifugal recirculation pump per loop, 25 hp. (VFD's will be required for each stage pump)

Twenty (20) 6.3" membrane housings.

Three (3) inline coolers with control valves and temperature probes.

Three (3) pressure gauges

Three (3) permeate flow meters with collection piping and return lines to permeate tank and divert valves. Necessary steam controls and heat exchanger for CIP Loop isolation valves and plug flow flushing valves for CIP and production control loops 1 - 3
Interstage isolation valves on loop 1 for production control.

System Controls:

One (1) NEMA 4X UL listed control cabinet
One (1) Panelview 1000
One (1) One (1) SLC 5/05
One (1) Ethernet hub

Necessary I/O cards

Two (2) magnetic flow tubes for system ratio
Necessary air and remote I/O cabinets

One set of alarm for high temperature, high pressure, and other functions.

Production functions will be completely automated.

NO MOTOR STARTERS OR FREQUENCY DRIVES INCLUDED IN THE SYSTEM.

General: The equipment supplied will be built to USDA and 3-A sanitary standards. Two (2) complete sets of operating manuals will be supplied.

UF Expansion system by one (1) stage:

Operation Parameters:

Feed: 45,000 lbs/hr of whole milk at 12% solids
Concentrate: 15,000 lbs/hr at 25% total solids
Permeate: 30,000 lbs/hr at 5.4% total solids

Hardware Required:

Five (5) Membrane vessels with closure kits
Filtration Engineering will guarantee the performance of this system as stated in paragraph one of the quotation, or FE will add the necessary membrane area and components at no charge to customer to achieve the stated rates.

Twenty (20) 6.3" x 38" UF membranes, Necessary feed and permeate headers, One (1) Pressure transmitter, One (1) temperature transmitter, Valves for stage isolation
Valves for plug flow flush, One (1) Fristam 25 HP pump and One (1) Permeate flow meter