

International Process Plants

Stock #600493

Glycerine Plant

17,000 MTPY



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Brief Overview

- Capacity: 17,000 metric tons/year of feedstock
- Technology: Free and Clear to Practice Worldwide
- Utilities: Electricity, Steam, Water and Fuel Gas
- Year Built: 2003
- Shutdown: 2009
- Product Produced: Pure Glycerine
- Raw Materials: Crude Glycerine



Major Equipment

➤ **Luwa Evaporator** (item 561-V0910):

Large Buss SMS wiped film evaporator, type CP 100, 18 m², 316Ti SS, built 1987.

- Internal operating pressure; -1 barg @ 250°C, 8,635 ltr
- Jacket 1 operating pressure; 40 bar @ 250°C, 120 ltr
- Jacket 1 operating pressure; 40 bar @ 250°C, 120 ltr
- Jacket 3 operating pressure; 15 bar @ 200°C, 8 ltr
- 1.2 m diameter by 5 m straight side
- Crane type 151 double mechanical seal
- 55 kw motor, 415 volt, 1,475 rpm motor via David Brown size MFD 980 gearbox, input 1,475 rpm, output 130.2 rpm.

➤ **Luwa Evaporator:**

Small unit, Buss SMS wiped film evaporator, 2 m², 316Ti SS, CS jacket.

- Internal operating pressure; -1 bar @ 200°C
- Jacket 1 operating pressure; 12 bar @ 200°C
- Jacket 2 operating pressure; 12 bar @ 200°C
- 410 mm diameter by 2,430 mm straight side
- 5 kw motor, 380 volt, 1,410 rpm motor, 450 rpm gearbox

Process Overview

- The Glycerine Purification Plant refines soap lye crude and splitters crude to produce glycerine with a high level of purity. These raw materials contain glycerine along with salt, water, and numerous other impurities. The process consists of a dryer to remove moisture, a Luwa evaporator where high temperature and vacuum remove most of the salt, a condenser to collect the glycerine, a bleaching column to remove color and odors, and a final evaporator to reduce the moisture content. The final glycerine product is 99.7% pure with less than 2 ppm chlorides.
- The raw material soap lye crude and splitters crude are blended together typically in an 80:20 ratio. The blended feedstock must meet the following general specifications: 80-90% glycerine, 10% water, an Ash/MONG ratio of 4:1, and less than 0.1% free alkalinity as Na₂O.
- The pre-heater is a shell and tube exchanger operating at 105°C using 4 bar steam for heat. The flash dryer operates at 105°C and 45 mbar which reduces the water content to less than 1.5%. The pre-heater and flash dryer have a very high recycle flow rate of 40 m³/hr.

Process Overview (cont.)

- The dried product then proceeds to the Luwa wiped-film evaporator which operates at 156°C and the very high vacuum of 4 mbar. The steam jacketed Luwa has a glycerine/water mixture recirculated to the rotor seal and nitrogen for cooling the bottom bearing. There is a complete spare rotor for the Luwa. The glycerine evaporates as the salt and other impurities slowly fall downward. The salt is discharged via the “salt egg” using the “air lock” created with two slide valves. The salt is eventually dissolved in water and sent out as a waste.
- The glycerine vapor passed through a disentrainment vessel and on to the condensing column. The disentrainment vessel is baffled and packed to remove any entrained salt or high-boiling impurities. The condensing column contains three condensers operating at successively lower temperatures. They operate at 127, 101, and finally at 30°C.
- The cool glycerine is then passed through one of the carbon bleachers where color and odor are removed. The carbon bleachers have 25 m³ capacity and utilize 54 filter nozzles in the bottom cone to keep the carbon in the vessel. Each filter nozzle has 20 plates which are 1 mm thick. There are two sets of Pall cartridge filters following the carbon bleachers to catch any carbon that escapes.

Process Overview (cont.)

- The glycerine product then proceeds through two heat exchangers operating with 4 bar steam. The product is heated to 130°C before going to the steam stripper which also operates with 4 bar steam. The stripper is under 4 mbar of vacuum, as is the final evaporator. The final evaporator is a wiped-film unit similar to but smaller than the Luwa. It operates at 130°C and removes the water down to less than 0.5%. The final product is then cooled, filtered, and sent to storage.
- The vacuum for these units is supplied in two stages. Vacuum pumps take the process down to 40-60 mbar. Vacuum ejectors driven with 1.5 bar steam supply the lower vacuum pressures down to 2-3 mbar.
- Process control systems and programming are completely up-to-date and are for sale with the facility. This unit uses the Siemens PCS7 system, which was installed in the 1980s but has been periodically updated. Promace is used as the process information management system (PIMS).

Equipment Details

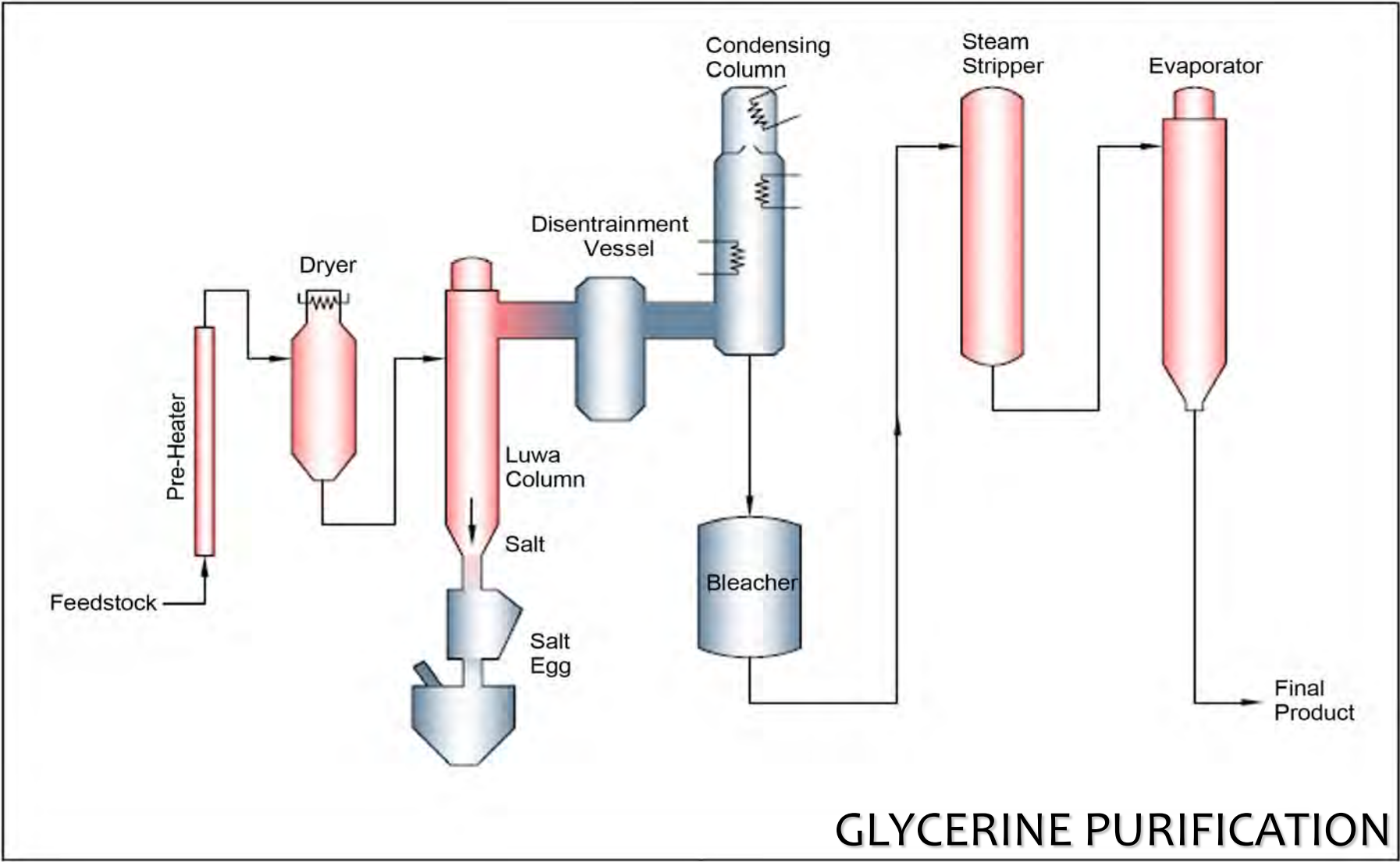
Equipment	Design Temp.	Design Press.	MOC	Dimensions
Pre-Drier	160°C	5.2 Bar	316L	4.9m (h) 1.1m (dia.)
Evaporator	250°C	40 Bar/ -1 Bar	316L	9.9m (l) 1.2m (dia.)
Condensing Column	160°C	1 Bar/ -1 Bar	316	10.4m (l) 2m (dia.)
Stripping Column	200°C	1 Bar/-1 Bar	316Ti	5.02m (l) 0.8m (dia.)

There are also (22) SS storage tanks with a total capacity of 1,600 metric tons associated with this plant.

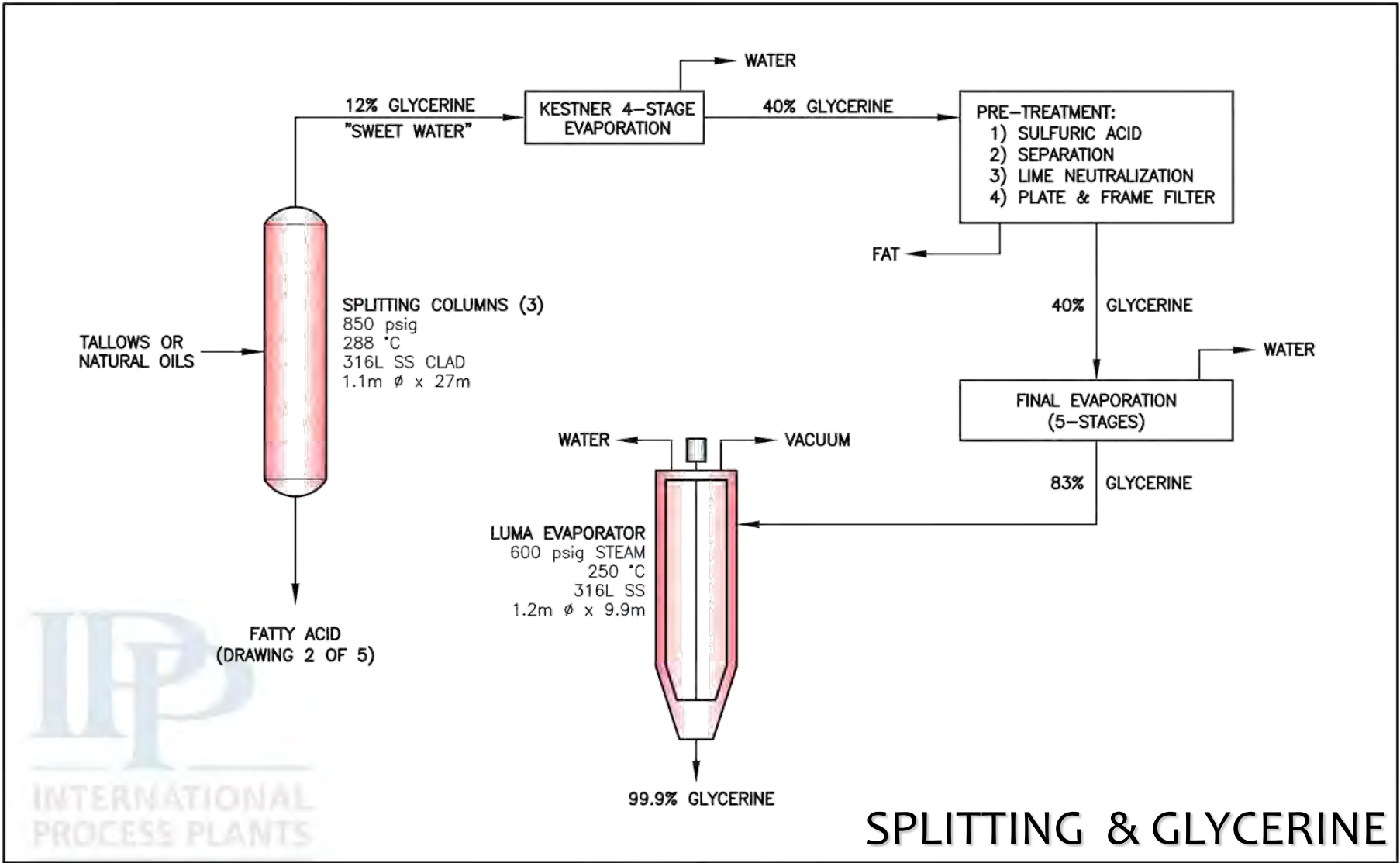


Bleachers

Process Flow Diagram



Process Flow Diagram



Photos



Final Evaporator



Luwa Evaporator Structure

Contact IPP Today!

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