1989 Buss-SMS-Canzler GmbH Thin Film Evaporator Type “LUWA”	
Mfg: Buss-SMS-Canzler	**Model: LN-0050**
Stock No. MGAB001.126	**Serial No. 138**

1989 Buss-SMS-Canzler GmbH Thin Film Evaporator Type ñLUWAò(FK0234). Model and S/N: LN-0050/138.D-6308 Butzbach. Capacity: 200 lbs/hr of water removal. 316 L Stainless steel construction. Size: 5.40 sq. ft. Buss, Type: LN-0050, S/N: 0050/138, Apparatus Internate: VAC @ 30 to 482 °F 10 Vol Gal. JK Evaporator Sec: Vac/240 PSI @ 482 °F 1.6 Vol. Gal. 2 Evaporator Sec: Vac/209 psi @ 650 °F 1.6 Vol. Gal. Buss Thin Flim Evaporator, Natô Bd: 474, Inside: Vac @ 30 to 482 °F, Jacket Steam: Vac/240 psi @ 482 °F, Jacket Hot Oil: Vac/209 psi @ 650 °F, Design Metal Temp: +30 °F @ 240 psi. Wolfe Mechanical Thin Film Evaporator, S/N: C-1250, Natô Bd: 230, Vessel MAWP: FV 50 PSI @ 366 F, MDMT: -20 F @ 50 psi, Jacket MAWP: 150 @ 366 °F, MDMT: 20 @ 150 psi. Procon Pump, 1-1/2 hp, 1725 rpm, 208-230/460 V, 5.3-5/2.5 amps, 60 Hz, 3 phase. Inlet/outlet: 1/2 in. dia. port. Overall dimensions: 8ft. 6in. L x 86 in. W x 15ft. H.

Goulds Centrifugal Pump, S/N: /43D195, capacity: 17 gpm @ 57 tdh, impeller diameter: 7 in., maximum design pressure: 285 psi @ 100 °F. Siemens Motor, 7.5hp, 460 V, 9.0 amps, 60 Hz, 3 phase. Inlet/outlet: 1-1/2 in. dia. 4-bolt flange.

Eastern Centrifugal Pump, Model: 11. Motor, 75 hp, 208-230/460 V, 2.7-2.6/1.3 amps, 3450 rpm, 60 Hz, 3 phase. Inlet/outlet: 3/4 in. dia. 4-bolt flange.

(2) Yamada Double Diaphragm Product Pumps, Model: 40 BSI, S/N: 057245, maximum air pressure: 7 mpr, pressure: 25-75 psig, flow rate: 1.5 gpm, fluid: Ethylene/Water. Inlets/outlets: 1 in. dia. 4-bolt flange.

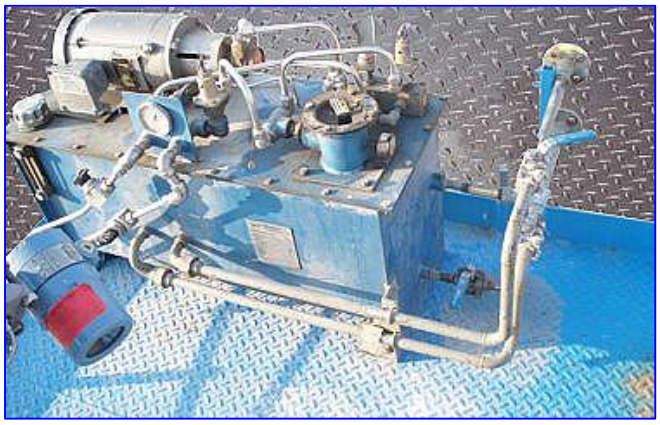
Rosemount Flowmeter. Output 4 to 20 Ma. Supply 12 to 45 VAC Max. Pacemaker Motor, 3 hp, 1735 rpm, 230/460 V, 9.3/4.65 amps, 60 Hz, 3 phase.

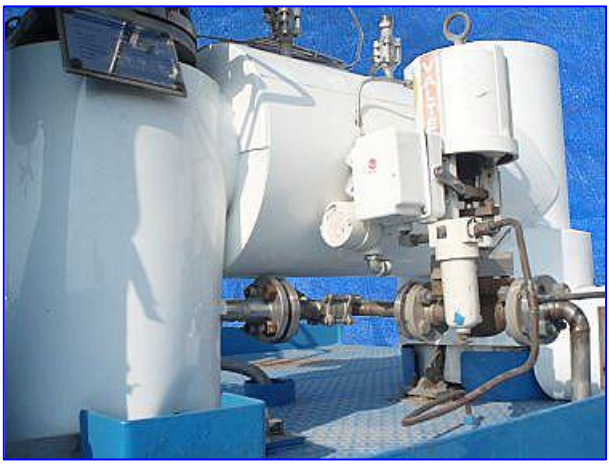




Receiver


LUWA
(ASSET#) FK0234
OPERATOR
DATE



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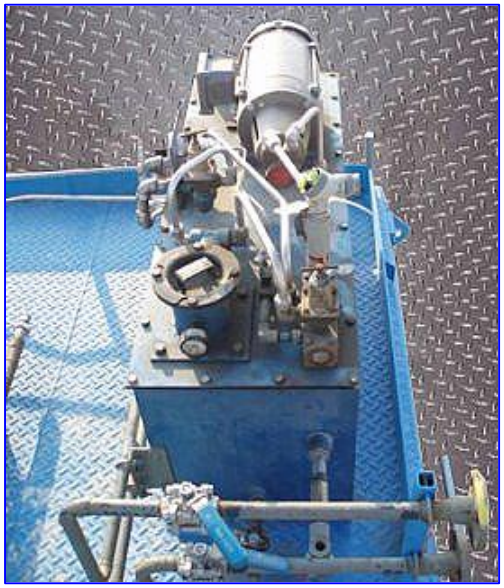

Basics

Thin Film Evaporation refers here to the thermal separation of products in a mechanically generated, thin and highly turbulent liquid film.

After entering the Thin Film Evaporator, the product comes into contact with the rotor: it is uniformly spread on the periphery by the distribution ring, then picked up by the first rotor blades and immediately formed in to a film (0.5 - 3.5 mm) on the heat transfer surface. In front of each rotor blade, the fluid creates a bow wave (Fig. 1).

The fluid in the gap between the heat transfer surface and the rotor blade tip is highly turbulent and this leads to intensive heat and mass transfer rates.

This turbulence produces high heat transfer coefficients even with highly viscous products.

Due to the intensive mixing action within the bow wave, temperature sensitive products are prevented from over heating and fouling on the heat transfer surface can be reduced or eliminated.

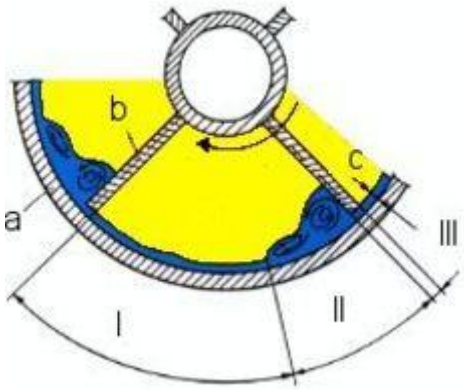

Fig. 1: a) inner shell b) rotor blade c) gap between rotor and inner shell I) film zone II) bow wave III) gap zone

Working Principle of vertical Thin Film Evaporators

The product to be treated is continuously fed into the vertical Thin Film Evaporator above the heating jacket (Fig. 2) and is spread on to the periphery by the distribution ring.
The product is then picked up by the rotor blades and immediately formed in to a thin turbulent film on the heat transfer surface.
The volatile components of the feed stock are therefore very quickly evaporated and flow counter-currently with reference to the feed, up towards the top of the evaporator to the rotating separator. Here, entrained droplets or foam are knocked out of the vapour steam and return to the evaporation zone.
The evaporated components (low boilers) then flow out of the evaporator in to the condensation stage, column or to another downstream process step. For special applications co-current vapour/product flow can be used in which case a separation vessel is fitted at the bottom of the evaporator below the rotor in place of the normal rotor mounted separator and the upper vapour outlet nozzle.
The non volatile components of the feed stock (high boilers) flow in a spiral path down the heat transfer surface to the bottom of the evaporator, arrive to the bottom part of the heat transfer zone in a single pass within a matter of seconds and leave the evaporator.

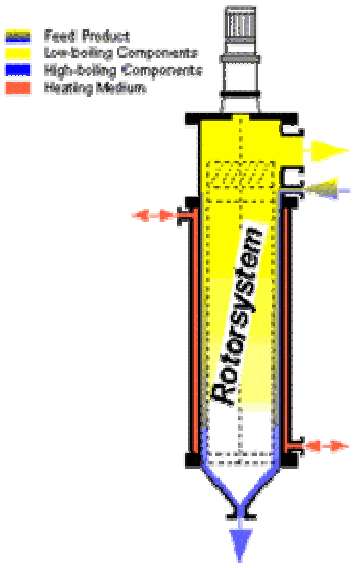

Fig. 2: Cylindrical design Type "Luwa" and "Sambay"

The working principle of vertical, conical Thin Film Evaporators (Fig. 3) is similar to the one of the horizontal, conical Thin Film Evaporators.

Working Principle of horizontal Thin Film Evaporators

The product is fed continuously to the horizontal Thin Film Evaporator (Fig. 4) at the larger diameter end, picked up by the rotor blades and spread immediately in a thin turbulent film on the heat transfer surface.
The evaporator's conical form results in a centrifugal force being imparted on the product by the rotor which effectively has two components: one perpendicular to the heat transfer surface and the other in the direction of the body's larger diameter end (Remark: the same effect occurs in the vertical conical Thin Film Evaporator also). The product hold up created by these forces and that of the incoming product ensures that the heat transfer surface is fully wetted independent of the evaporation ratio and/or the feed rate. Localised product over heating and thermal degradation are thereby reduced or avoided altogether.

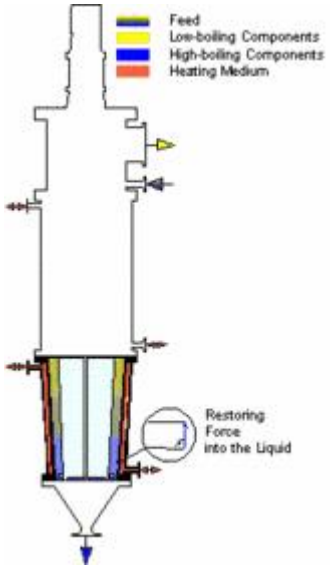

Fig. 3: Vertical conical design type "Sako KV"

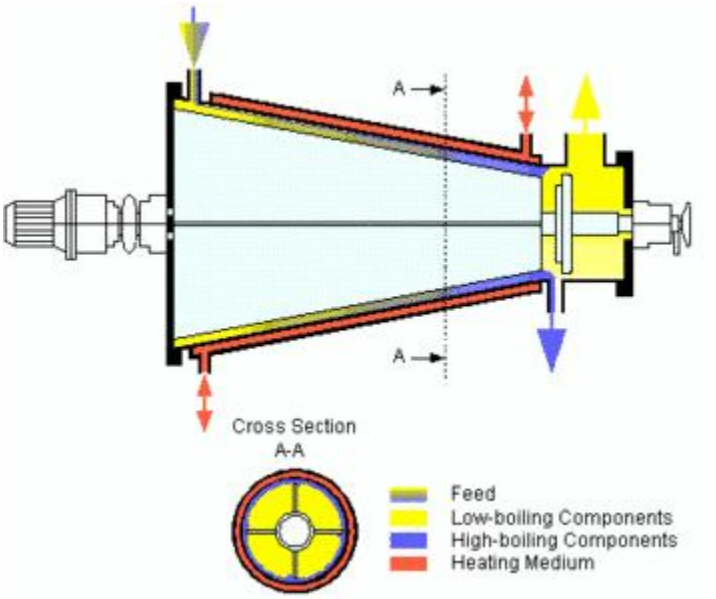

Fig. 4: Horizontal conical design type "Sako KH"

The product vapour (low boilers) flows co-currently through the horizontal Thin Film Evaporator and in to the rotating separator. Here, entrained droplets and foam are knocked out and pass in to the liquid phase outlet (high boilers). The dry vapour then passes in to the condensation stage, column or to another downstream stage.

Thin Film Evaporator type "LUWA"

The Thin Film Evaporator type "LUWA" is equipped with a rigid-blade rotor (Fig. 5). It handles products with viscosities up to about 50,000 mPas. The rotor with his closed-type construction and his very smooth surfaces is easy to clean and is therefore used for a wide range of products, particularly in the food industry but also in the pharmaceutical industry (Fig. 6).

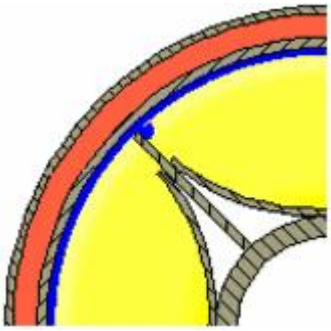

Fig. 5: Cross-section of Thin Film Evaporator Type "LUWA"

Fig. 6: Thin Film Evaporator Type "LUWA"