

SILOXY EVAPORATOR TECHNOLOGY FOR PULP AND PAPER MILLS



The spent liquor from the cotton linter pulping process is unique. The organic compounds stripped from the linters are primarily fats which have a high tendency to foam. The spent liquor from the pulping process has a dissolved solids (i.e., organic and inorganic material) concentration of around 8%. A larger amount of the water must be removed from the liquor before it can be combusted. A multiple-effect evaporator is typically used to remove the water, however, special care must be taken in the design of the evaporator system to minimize the generation of foam.

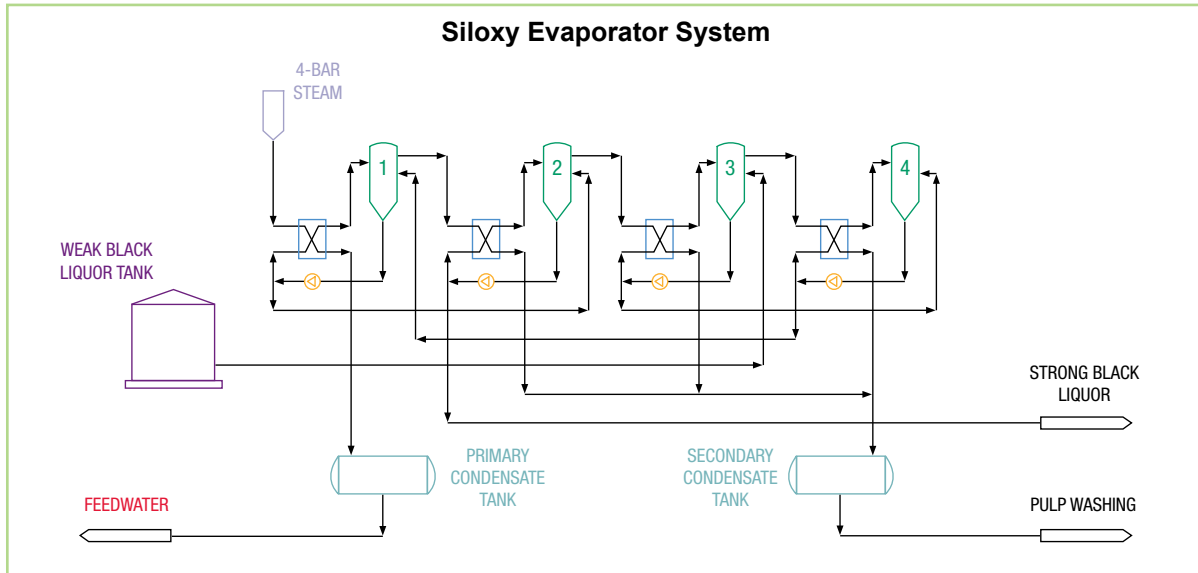
THE SILOXY EVAPORATOR SYSTEM

The novel Siloxy evaporator system utilizes the forced-circulation evaporation principle and a specially designed steam/liquor separator to minimize foaming. An evaporator system based on these principles is in operation at a cotton linter mill in Spain.

The overall design of the Siloxy process (see Siloxy Oxidizer) minimizes the size of the evaporator system.

In the Siloxy oxidizer (see Siloxy Oxidizer), high-purity oxygen is used for combustion, and the water in the combustion gases is condensed and the latent heat in the water can be recovered. Therefore, the thermal efficiency of the Siloxy system is very high and is not a function of the black liquor concentration from the evaporator system. Since oxygen is the combustion gas, the black liquor firing solids can be much lower. As a result, the solids concentration from the evaporator set is lower, enabling a reduction in the size of the evaporator system.

TECHNOLOGY FOR SUSTAINABLE PULP PRODUCTION



TYPICAL SYSTEM CONFIGURATION (4-EFFECT)

A typical evaporator system configuration is shown in Figure 1. Primary steam at 4-bar(a) pressure from the Siloxy oxidizer is fed to the first evaporator effect. Secondary steam from the evaporated liquor is led through the effects in the order 2–3–4–condenser. Atmospheric steam generated in the Siloxy oxidizer is added to the secondary steam entering the third evaporation effect.

The sequence of evaporation is determined based on the temperature of the mill’s weak black liquor. The strong black liquor at

the desired dissolved solids content is pumped from the second effect at a temperature near 100°C to an atmospheric strong liquor tank.

Primary steam condensate is extracted at about 120°C and piped to the mill’s feedwater tank, where the excess heat is utilized to heat the makeup feedwater. Secondary condensate (i.e., the water separated from the black liquor during evaporation) is collected in a condensate tank operated under vacuum. The secondary condensate is pumped from the condensate tank at a temperature of about 60°C. This hot, only slightly contaminated water can be used for pulp washing.

CONTACT US

For more information about this novel Siloxy evaporator technology and how it could help you, contact us today.

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