

PULP MILL

The manufacturing of Paper using the Kraft Mill process generates liquids called Black Liquor and Soap in the digester. When the wood is cooked in the digester a caustic bath is used. The Black Liquor is the by-product from that process. The Soap is a combination of resin and fatty acids which becomes Tall Oil when Acidified. Tall Oil is a product that the pulp mills sell for a profit, and the removal of the Soap from the Black Liquor improves the performance of the evaporation process.

The Black Liquor and Soap mixture is condensed by evaporators to increase the total solids content of the solution. When the solids content reaches 25-30%, the Soap is at the optimum concentration for separation. At this point a Soap tank is used to separate the Black Liquor and Soap. These tanks utilize a long residence time to allow for separation and mechanical skimmers to remove the Soap. In some plants, air is used to aid in the separation causing the Soap to foam.

Agar Probes are used to indicate the position of the Black Liquor and Soap interface. The Black Liquor is an aqueous solution and provides a very high reading from the probe and looks like water to the Agar technology. The Soap being organic provides a much lower reading. When the probe is positioned below the skimmers, the indication will allow the operators to know whether they are skimming pure Soap or some Black Liquor.

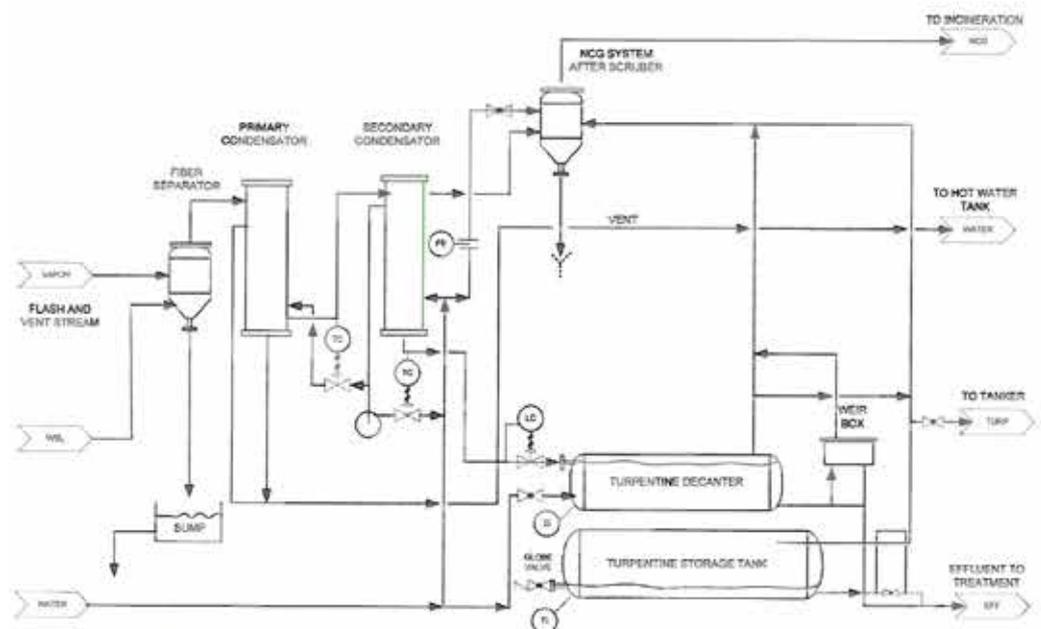
A separate Agar probe can also be used to indicate the concentration of foam if air flotation is used.

The proper separation of these fluids benefits both the Black Liquor process as well as the Tall Oil production. The Soap in the Black Liquor will reduce the efficiency of the concentration process thereby reducing the efficiency of the boiler recovery operation.

Any extra Black Liquor in the Soap has a number of adverse affects on the Pulp Mill. First, a much larger amount of acid must be used to neutralize the Soap in the Tall Oil processes. Second, the Black Liquor that is lost must be replaced by fresh caustic at a direct expense to the plant. Third, the quality of the Tall Oil is reduced which lowers the selling price. Fourth, the neutralization of the Black Liquor can release H₂S, which is an environmental hazard.

After the Tall Oil is generated from the Soap, the Oil is stored first in a Wet tank (for water separation) and then second in a Dry tank. In the Wet tank, an Agar probe can also be used to control water separation.

Another location in which an Agar probe can be of benefit is in the Turpentine process. Turpentine and water vapor are recovered from the Digester relief gases. These gases are condensed, then turpentine is decanted from the water. Any liquid that is mixed with these gases can cause emulsions to be generated in the decanter. The presence of these emulsions make complete separation very difficult to control. Agar Interface Probes used in the decanting vessels will greatly increase the operator's ability to control the process. The Agar probes perform just the same in this process as in any other organic / aqueous separation with the Turpentine registering as the oil phase.



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