IsoFlo™

The IsoFlo™ technology is a reactor for oxidizing white or black liquor with a plug flow design to reduce the volume and maximize the efficiency. The white liquor can be partially or fully oxidized depending on where the oxidized white liquor will be used.

The problem

When white liquor is used in processes such as oxygen delignification and bleach plant extraction stages the sodium sulfide (Na2S) have negative effects on the quality of the pulp. The sulphur contents in black liquor can be a cause of problems with odours in the mill.

The solution

With NORAM's IsoFlo™ reactor the Na2S is either partially oxidized to thiosulphate or fully oxidized to sulphate. The partly oxidized white liquor can be used in the Oxygen Delignification, Eo bleaching stage and in SO2 scrubbers. The fully oxidized white liquor can be used in the Eop and OP bleaching stages. With black liquor oxidation the odours from the sulphur contents are decreased and this technology is utilised in NORAM's LignoForce technology.

How it works

The IsoFlo™ reactor is designed based on a vertical U-tube exchanger which offers the possibility to recover heat from the reactions. Oxygen is injected in multiple stages in order to increase the efficiency of the reactor. With the plug flow design there are no by-passing, channeling or back-mixing issues as seen with other reactor types. Before the reactor, strainers are installed in order to capture any solid particles and decrease the risk for plugging in the reactor. Figure 1 shows an installed IsoFlo™ reactor.

The benefits

The IsoFlo™ reactor is optimised both for a short reaction time to have a high chemical utilisation but also to minimize secondary reactions and thereby reducing the O2 consumption.
With the vertical bundled orientation the footprint is minimized along with the fabrication cost. With the controlled temperature operation the safety, reliability and life of the equipment is increased.
With the IsoFlo™ black liquor oxidation, see Figure 2, the malodourous product is eliminated and the sulphur emissions are decreased.

Types of oxidizers

In Figure 3, the plug flow reactor can be seen. NORAM also offers bubble column and pipeline reactors as well as air liquide O2 based system solution.

Figure 1 Installed IsoFlo™

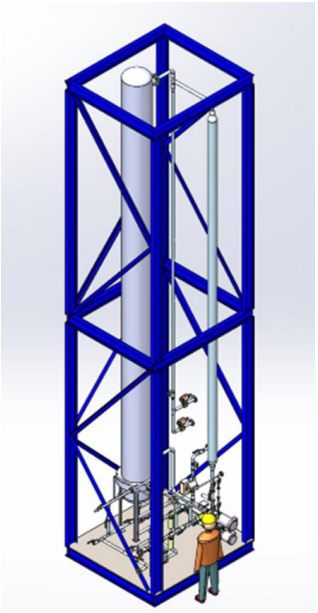

Figure 2 IsoFlo™ plug flow

Figure 3 IsoFlo™ Black Liquor Oxidizer, pipeline reactor

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