

TECHNICAL NOTES

FOREST PRODUCTS LABORATORY

U. S. FOREST SERVICE

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ACID PROOF LININGS FOR EXPERIMENTAL SULPHITE DIGESTER

The problem of lining an experimental sulphite digester is different in many respects from lining problems encountered in commercial practice. The most important difference is that due to size. Others arise from the fact that in order to obtain quantitative yields, the experimental digester must be washed free of pulp immediately after each blow, and a lining which spalls off and produces a dirty pulp is unsatisfactory. It is out of the question to riffle the pulp and obtain reliable yields.

Many different kinds of linings were installed in the experimental digester at the Forest Products Laboratory before a satisfactory one was found. Because of difficulties due to size, tiling similar to that used in commercial installations was impractical. Lead was first tried, but was soon discarded on account of the "creeping" action of this metal when subjected alternately to heat and cold. Bronze was found to produce dirty pulp. A solid lining of litharge and glycerine lasted only a short time. Then cement briquets were made of many mixtures, given different coatings, and subjected to the action of sulphite cooking acid. The results of this experiment led to the installation of a lining of 1:1 cement and crushed quartz sand, 3 inches thick and coated with sodium silicate. This lining held up fairly well for some time, though particles of sand were continually falling off and causing dirty pulp.

It was finally decided that the only way out of the difficulty was to install a solid stoneware casting of acid proof tile 1-1/2 inch thick. As the digester is joined in the middle, the shape of the casting offered no particular difficulties. Liberal tolerances were allowed on all dimensions and openings difficult to locate were omitted in the casting. A stone cutter with an air chisel was able to put these holes through without breakage after the casting was in place and backed with cement. This lining has proved exceedingly satisfactory.