

LignoForce™

The LignoForce™ technology is a lignin recovery system developed with FPIInnovations. The result is an efficient, safe, small-footprint plant with the flexibility to produce an endless variety of lignin products. Currently, one pilot plant and one full-scale plant is in place.

The problem

Today, lignin is burned in the recovery boiler and the capacity is often the limiting factor for the pulp production due to the high equipment cost. Lignin has unused potential as raw material and replacement for fossil-based materials. With lignin recovery, there is a problem and safety issue regarding sulphur emissions both with the odour and the negative health effects.

The solution

The LignoForce™ recovers lignin with **different pH** depending on the product requirement. The system is **flexible** considering the feedstock and can be used with hardwood, softwood, eucalyptus and mixed species. The lignin can be used in the lime kiln as fuel and/or dried and sold as a product.

How it works

The LignoForce™ system utilizes Noram's IsoFlo™ oxidation technology where the black liquor is oxidized to a various extent depending on the product. The lignin is precipitated with CO₂ addition before being filtered in a counter-current filter press. The lignin is washed with water and sulfuric acid to reduce the sodium and sulfur contents of the lignin. Depending on the end-uses moist lignin can be extracted and sold as a product. Otherwise, the lignin can be dried in a ring dryer and sent to a lime kiln burner and/or a packing system. Figure 1 shows an installed LignoForce™ plant.



Figure 1 Installed LignoForce™

The benefits

Through the IsoFlo™ oxidation, see Figure 2, the **malodorous product is eliminated** and the **sulphur emissions are decreased**, particularly considering H₂S. The oxidation results in **lower CO₂ and acid requirements**. The heat generated in the oxidation step is recovered to **decrease steam demand**. The counter-current filtration results in a high efficiency which gives **lower acid and water consumption**.



Figure 2 IsoFlo™ Oxidizer

Lignin product

In Figure 3, the dried lignin product is seen. Lignin has various end-uses both as a fuel and as a raw material. Examples include adhesives, bitumen replacement and thermoplastics.



Figure 3 Dried Lignin

