

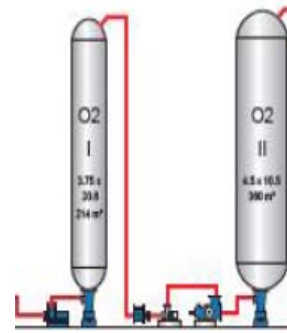
## Master Thesis

### Full oxidation or partial oxidation of white liquor in pulp oxygen delignification

Purpose of the study is to investigate the process of white liquor (WL) oxidation to reduce a consumption of sodium hydroxide (NaOH) in the oxygen delignification (OD) stage. Usually, NaOH used as an alkali source in OD stage that increases a cost of the process and creates imbalance in Na/S ratio in the recovery cycle. Thus, a partial replacement of caustic soda or/and up to 100% replacement should be investigated. It is known that during the WL oxidation a sodium sulfide ( $\text{Na}_2\text{S}$ ) is converted to thiosulfate ( $\text{Na}_2\text{S}_2\text{O}_3$ ) - partially oxidized white liquor or to sulfate ( $\text{Na}_2\text{SO}_4$ ) - fully oxidized white liquor. It is believed that a partially oxidized white liquor (OxWL) is suitable for OD stage at the Kraft production process. The mill partner should carefully evaluate both types of systems due to differences in operational costs.

#### SCP Ruzomberok $\text{O}_2$ delignification plant

Two reactors + two wash presses  
 Target kappa 8.5 (inlet kappa 16.5)  
 Alkali consumption (NaOH + untreated WL) 16 kg/t  
 $\text{O}_2$  consumption 16 kg/t  
 Retention time 18+36 min



Overall, further improvement of the OD stage will allowing pulp quality improve in terms of strength at optimal kappa number reduction.

A detailed conceptual modeling for this study as well as time schedule and laboratory tests will be defined together with the University partner.

Mondi R&D paper (Grigory Zinovyev, Johannes Leitner)

University partner: TU Graz (Roman Poschner, Prof. Ulrich Hirn)

Mill partner: Mondi SCP Ruzomberok (Michal Kebisek, Tomas Sutto)

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Start date: to be defined; ~Summer 2021  
 Place of work: TU Graz  
 Salary: €1030.- per month, 6 month contract