# THE IMPACT OF BLEACHING CONDITIONS ON THE VISCOSITY OF HARDWOOD PULP

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## ABSTRACT

Positive results have been achieved in recent years in upgrading the paper-grade pulp to dissolving pulp type as raw material for Lyocell fiber. The pentosans content in such pulps is significantly higher than in the dissolving pulps currently employed for this purpose. The SCAN viscosity is on important parameter influencing in particular the processing of pulps in the production of spinning solutions. The bleached pulp viscosity must be low and within a small target window (320 to 400 ml/g) for the Lyocell process. Otherwise, problems can occur during production. Lower viscosities lead to a worsening of themechanical properties of the lyocell products. Higher viscosities may in particular lead to an increased viscosity of the spinning solution, so that spinning is slower overall.

The purpose of the present study is to evaluate the possibilities of controlled decreasing of final pulp viscosity by moderate changes in bleaching conditions. Paper grade hardwood pulps ware used in this investigation. The effects of higher alkali charge, reaction time, and addition of peroxides in the oxygen delignification and extraction steps were investigated. Hot chlorine dioxide bleaching was studied at higher acid consumption and at different temperatures and reaction times. The effect of alkalinity in the final chlorine dioxide stage and hypochlorite addition was also investigated.

The results from that investigations show that the hot chlorine dioxide stage, the alkaline conditions in final chlorine dioxide stage and the addition of peroxides in the oxygen delignification and extraction steps do not provide a significant viscosity reduction of the pulp. Better results are obtained after oxygendelignification at a higher alkali charge. A significant reduction in pulp viscosity is observed afteraddition of hypochlorite in the extraction stage. Similar results are obtained also after addition of hypochlorite in the final chlorine dioxide stage. Here, due to the alkaline conditions, a significant content of active chlorine is observed in the spent liquor, but this residual chlorine can be reused in the previous bleaching stages. No increase in AOX in final bleached pulp is analysed. In conclusion, considering theenvironmental problems, hypochlorite appears to be the most suitable agent for controlled reduction of the final pulp viscosity.

**Keywords:** hardwood pulp, bleaching, hypochlorite, viscosity.

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