

# Influence of DNA as additive for market pulp on tissue paper

A. Cláudia S. Ferreira, Roberto Aguado, Ana M. M. S. Carta, Raquel Bértolo, Dina Murtinho e Artur J. M. Valente



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## Abstract

Given the competitiveness in the tissue paper market, manufacturers are continuously seeking eco-friendly options to improve its properties. This work highlights the incorporation in tissue paper of fibrous formulations of deoxyribonucleic acid (DNA), taking advantage of the extremely versatile functionality of this macromolecule, which is, besides biodegradable and obviously biobased, safe for human health. Blends of pulps and salmon DNA were characterized through thermogravimetric analysis, scanning electron morphology, water absorptivity and desorption rate monitoring. It was found that water uptake increased by +43 % for a 1:9 DNA/pulp blend. Then, the presence of DNA accelerated water release. Moreover, DNA was used to produce laboratory tissue paper sheets in two ways: from said blends and by direct addition to the pulp slurry. Each method had a different effect on paper properties, the most promising result being for pre-blending, by which the tensile index increases from 7 to  $9 \text{ N} \cdot \text{m} \cdot \text{g}^{-1}$ . Although it was not possible to improve every desirable property, this was not detrimental to softness or water absorptivity. In conclusion, DNA showed potential as a dry strength additive not only for tissue paper, but also for food wrapping or for any other application that could benefit from biocompatibility.