



NMP3-CT-2004-500311

Sustainpack

Innovation and Sustainable Development in the Fibre Based Packaging Value Chain

Instrument: **IP**
Thematic Priority: **3**
Nature of deliverable: **R**

D3.04

First deliverable for SP3

Nanofibres, particles, and matrices selected for evaluation within SP3

Due date of deliverable: 2004-11-30
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Start date of project: 2004-06-01

Duration: 4 years

Organisation name of lead contractor for this deliverable:
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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Introduction

The following report describes the activities and the work performed within the "Sustainpack 3 Fibre based composite films" project (SP 3) during the first 6 months.

Following the Sustainpack kick-off meeting in Stockholm in June 2004 it was decided that the SP 3 kick-off meeting was to be held in Valencia in July 2004. The workpackage.3.1 (WP 3.1) workplan were presented and an overview of the work distribution given. All partners in SP 3 selected processing methods and matrices for evaluation. Clays and fibres were discussed and the partners were informed that STFI-PF and KCL were to provide fibers for SP3 and SHU the nanoclays.

The work have been conducted separately, but with continuously contact between partners. This work can be seen as kind of a trail and error study of how well matrices and particles/fibres have worked together. The chosen materials are presented below. Unfortunately no nanofibres have been available during the first six months of the project. This is due to the time needed for KCL respectively STFI-PF characterise the nanofibres.

Matrices

During the first six months of SP 3 the main focus has laid in evaluating different renewable polymeric matrices to be used in the future work. Most of the partners in SP3 have been involved in this step, and many different matrices have been tested with several processing methods, these are listed in table 1.

Partner	Matrices
A & F	PLA Potato Starch
IATA-CSIC	PCL PHB, PHB-HV
ITENE	PLA, PHB Starch based
STFI-PF	Wheat gluten Na-Alginate Chitosan
KTH	PLA Starch based
RISOE	PLA PHB, PHBV
STU	Starch PHB-PCL
Ahlstrom	Chitosan Gelatine

Table 1. Listed over selected matrices for the different partners.

Fibres

Following the Valencia meeting contact with Mikeal Ankerfors at STFI-PF and Mika Vähä-Nissi at KCL were made about the supply of cellulose nanofibers. Due to different reasons they were, unfortunately, not able to deliver any fibres at all before, as it turned out, November 2004, and at that stage just standard MFC. (STFI-PF). Nanofibres with different treatment is estimated to be available in March 2005 (KCL). The work at KCL mainly emphasises the modification of cellulose fibres by mechanical refining and/or chemical means. Once the fibres have been delivered experimental testing with different matrices will start. STFI-PF still have considerable time in which to develop fully characterised cellulose nanofibres for circulation to project partners. In table 2 fibre types are listed with estimations regarding availability.

Partner	Fibre	Availability
KCL	Mercerised dissolving pulp refined at 500 revs	december 2004
	Selected mercerised dissolving pulp*	march 2005
	Selected mercerized ECF pulps*	march 2005
	Selected parchementized dissolving pulps*	march 2005
	Selected parchementized ECF pulps*	march 2005
STFI-PF	Micro fibrillated cellulose (MFC)	Today (delivery time ~ 4-5 weeks)
	Cellulose nanofibers	During 2005

Table 2. List over fibres and estimated delivery time.

Particles

At the first stage of the project ordinary commercial nanoclays have been used, such as different types of montmorillonite. Later on, organo-clays developed and supplied by SP 2 specially designed for a good dispersion and compability with the matrices will be used. Also Sheffield Hallam University (SHU) is expected be a big resource in choosing and preparing clay for the systems. Clays that will be used are different types of montmorillonite, laponite, and hectorite etc.