

**Fiber analysis of paper**

10.01.2012 sf/se

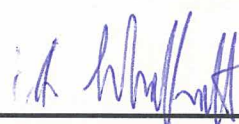
Ordered by: Greenpeace Canonbury Villas London N1 2PN United Kingdom

Date of order: 2011-12-13

Your order number:

Our order number: IPAP-11-320

Institution for  
Paper Science and Technology  
IfP-g GmbH  
Alexanderstraße 8  
64283 Darmstadt



Test	Pulp	Sample
		<b>Producer: XEROX</b> <b>Brand name: ASTRO</b> <b>***Product details on the sample-package:</b> <b>5033811987913/007R98791</b> <b>Copy paper</b> <b>Country of delivery: Greece II</b>
Number of test specimen: 5 Estimated number of fibers examined: ca. 2500		
Qualitative identification*	Chemical softwood	Douglas fir identified
	Chemical hardwood	Acacia; 130 unusual vessels of different species were found, but unknown
	Mechanical pulp/ rag	Traces
Number of test specimen: 2 Estimated number of fibers examined: ca. 800		
Quantitative determination*	Chemical softwood	ca. 10 %
	Chemical hardwood	ca. 90 % - ca. 30 % Acacia** - ca. 60 % Unknown hardwoods**
Evaluation	<b>There is a strong indication for mixed tropical hardwoods as 130 unknown vessels have been found, accompanied by acacia. There are many destroyed vessels which could neither be identified nor counted.</b>	

\*\*The vessels of all hardwoods were counted; together with the number of each kind an estimation of each share is given.

\*\*\*Product details in your letter: 75 g/m<sup>2</sup>, 5033811587915  
Adress: Greenpeace Greece, Kleissovias 9 str., 10677 Athens, Greece

### Fiber Analysis by Microscope

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#### Legend

\*applied test methods: ZM/IV/74, T 401om-03  
observation in transmission, magnification 100 times  
Dyeing methods: Herzberg stain, Alexander stain

#### Weight factors used in quantitative determination

Softwood pulp: 0,9  
Hardwood pulp: 0,5  
Mechanical pulp: 1,3

#### Number of test specimen (qualitative identification): 5

Either the sample or the ply to observe have been examined for optical brightener agents (OBA).

If no OBA is detected the sample is surely made from virgin pulps as recycled fibers always contain OBA.

If OBA is detected this will not necessarily mean recycled fibers are present as OBA is applied in virgin fibers for certain paper grades.

If ink residues are detected on the fibers this will surely mean that recycled fibers are present.

#### Qualitative identification:

This method only gives different wood species without the amount in the pulp.

#### Softwood pulp:

Softwood pulp can be separated from hardwood pulp by dyeing with Alexander stain.

Different softwoods can only be separated by fiber morphology, mostly of spring tracheids.

Autumn tracheids of different species often appear very similar. This means that even if only certain species were identified other species may not be excluded for sure.

#### Hardwood pulp:

Hardwood pulps can be separated from each other by examination of their vessels. However, fibers are treated during the pulping and paper making process. This may lead to impossibility of examination of the morphology of a detected vessel.

Therefore, if a detected vessel is accurate enough, the species can be determined and is mentioned in the report, but others may occur, too.

To determine a species it is necessary to have a pulp made of this species as an example for comparison.

Very few tropical hardwoods have been pulped so long which means that no samples or literature with figures are available.

In consequence, for qualitative identification, tropical hardwood can not be excluded if unknown vessels were found.

But these unknown vessels may derive from unusual wood used for pulping that is not necessarily tropical hardwood or from vessels that could not exactly be identified.

Eucalyptus and Acacia are not regarded as tropical hardwood but as wood raised in plantation.

#### Literature:

Fiber Atlas, Springer Series in Wood Science, 1995

Faseratlas, Dr. Marianne Haders-Steinhäuser, 1974