

Nonwood Fiber Content Papers - Part 1: Corrugating Medium Physical Properties

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April 2002

The data contained in the following table is from an excellent paper entitled "Industrial Experiences & Problems Involved In Stock Preparation & Papermaking Utilizing Non-Wood Fibrous Materials", written by D.K. Misra, Thessalian Pulp & Paper Industries Ltd., Larisa, Greece, and published in 1975 in the TAPPI Non-Wood Plant Fiber Pulping Progress Report No. 6.

This data was developed from tests on commercially produced paper and paperboards which were available at the time. Some of this data likely is a little outdated due to advancements in paper machine design such as improvements in Fourdrinier drainage and the development of twin wire paper machines and no-draw press sections, all of which allow for a high nonwood fiber fraction in the furnish. Nevertheless, this actual mill data still offers a valuable insight into the potential use of nonwood fibers in papermaking.

Unfortunately, since this paper was presented, no one has undertaken a similar ambitious project to determine the characteristics of currently available nonwood fiber content papers. With the renewed interest in nonwood fibers for papermaking in North America and Europe, perhaps the time has come for a research organization to undertake such a project.

The following table provides physical properties of **corrugating medium** produced from nonwood pulps. Even using pre-1975 technology, a few points to consider include:

- the concora and stiffness values of nonwood fiber content corrugation medium were very comparable to paper produced with 100% semi-chemical woodpulp
- fluting paper produced with 100% wastepaper showed lower concora value
- breaking length of corrugating medium produced from 100% semi-chemical woodpulp was comparable to values obtained with 85% **bagasse** pulp in the furnish
- corrugating medium produced from 100% **wheat straw** had relatively low breaking length value
- however, as concora and stiffness are the primary requirements of corrugating medium, papers produced with high proportions of nonwood pulp still fully met market requirements.

Physical properties of corrugating medium produced with nonwood pulps								
Furnish	Basis Weight (g/m ²)	Ash (%)	Thickness (microns)	Breaking Length (m)	Burst Factor	Cobb (g/m ²)	CMT (lbs)	Ring Crush (lbs)
Bagasse								
85% bagasse, 15% wastepaper	115			5510	32.0		60	38
45% bagasse, 55% wastepaper	127	2.2	275	3080	17.5	307	63	40
Straw								
100% wheat straw	90			3980			48	28
100% wheat straw	115			3720			59	36
100% wheat straw	125			3820			65	42
100% wheat straw	127			4035			72	45
50% wheat straw, 50% wastepaper	144				23.6		70	39
70% rice straw, 30% wastepaper	122	10.5	235	3270	20.8	38	32	26
For Comparison								
100% semi-chemical woodpulp	127		215	5350			73	37
100% wastepaper	115	3.8	240	5120	29.4		42	40