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3 Steps to Put a Pitch Control Strategy in Place

Take more control over pitch by feeding less.

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Pitch is a natural resin found in all wood types from all over the world: No matter what you do, it's a major factor in your papermaking process. If left unchecked, it can degrade the quality of your product and cause problems with the equipment you use to make it.

Your Product

During the pulping and papermaking processes, pitch separates from the wood and builds up on the surfaces of equipment. When it breaks free from those surfaces, it eventually gets broken down into brown or black specks that are clearly visible in your final product. These lead to quality downgrades. Discounted rates that result in less profit per ton. Or worse, a total rejection, which is extremely costly. You might even lose your customer.

Your Equipment

Pitch also takes a toll on your equipment. It gums up or scales up your pulp or paper machines, including important wires and sensors. This can lead to a less efficient — and more expensive — process. You're looking at time lost for cleanup and repairs, or even extended shutdowns.

The smartest approach to a pitch control program for pulp and paper begins with prevention and preparation. Use these three steps to get ahead of pitch.

STEP 1 Practice pitch prevention.

You can proactively reduce your need for chemical treatment.

- *Manage your woodyard wisely.* The less bark the better, with <1% being optimal. Age chips 30 to 45 days for best results. And be aware of seasonal impact on pitch counts.
- *Keep a tidy house.* Monitor lubrication processes for leaks and quickly respond to missing lubricant inventory. Ensure seals are intact and coolers aren't leaking oil or hydraulic fluid into cooling water.
- *Wash brownstock well.* Keep equipment well maintained and under DCS. Operate at the highest temperature possible (>60°C is preferred). Optimize dilution factors. Maintain and manage a well-designed defoamer program with proper feed points and control, using high-quality Buckman defoamer chemistry.


Pitch on a doctorboard.

STEP 2 Collect data.

The key to a value-based approach to pitch control is knowing your equipment, operating parameters, and systems. To do that, you need quality routine inspection programs and data, lots of data.

- *Know your physiology.* What's your grade structure? Do you have hardwood and softwood campaigns? How do seasonal changes impact your pulp?
- *Know your process design.* Where do you have changes in temperature and pH? Where is the best feed-point selection?

STEP 3 Pick a chemical pitch control program that fits.

- *Dispersion.* Works best with high temperature and high pH to keep wood acids colloidal in size so they can be easily washed from pulp.
- *Fixation or adsorption.* Acts as a retention chemistry that uses a polymer to attach the pitch to fiber.
- *Enzymatic.* Breaks down specific pitch components into more manageable fatty acids which can readily be removed from the process.
- *Detackification.* Neutralizes the anionic charge on the resin particles and can stay in the system to help with encapsulated pitch.
- *Encapsulation.* Surrounds colloidal pitch with a hydrophilic shell, typically with alternative pitch control products, such as talc, which becomes an inert filler, remaining in and being sold with the sheet for a profit.

When it Comes to Pitch, the More You Know, the Better You Control

Know the components. Wood resins are the major building blocks for pitch deposits, but other materials attach to them during the pulping process. Identifying components is your first step toward managing pitch more accurately and cost-efficiently. These could include defoamers, hydraulic fluids, lubricating oils, talc and metals.

Lab Analysis: Most precise, but you have to wait for results. Your routine deposit analysis includes:

- Percentage of toluene/ethanol extractive (% extractable organic)
- Attenuated total reflectance analysis (direct infrared spectroscopy)
- Pitch characterizations
- Silicone
- Scanning electronic microscope (SEM) imaging
- Stereographic pictures

Common tests you might request:

- Ash percentage
- Brightness metals
- Dichloromethane (DCM) extractives
- Toluene/ethanol extractives
- Acetone extractives
- Fourier transform infrared (FTIR) analysis
- Silicone

Field analysis: Simple, routine, and fast. These options are convenient and relatively easy to perform, but keep in mind they're far more subjective than lab analysis.

- Visual inspection of process equipment
- Shear test
- Plates or coupons
- Hemocytometry
- Hydrophillic and hydrophobicity testing


Pitch on a repulper.

Be Careful When Comparing Tests

Each test can use different solvents to analyze the same sample, and that can mean different results.

Example: The toluene/ethanol test will extract more than just pitch from a sample, while DCM is better at identifying just the pitch components.

Be sure you understand how to read the results. If you don't, you could misinterpret the data. Then you might miss an opportunity to address a pitch issue in the most efficient way.

Total Extractives (grams)	0.0373
DCM Extractives (%)	17.75
Pitch Components	
Sterol Fatty Acid Esters (ppm)	69310
Triglycerides (ppm)	40833
Sterols (ppm)	4994
Fatty Acids (ppm)	15318
Resin Acids (ppm)	< 75
Total	130455

Comments: ppm = mg/L

Example: Look closely at this high-pressure liquid chromatography (HPLC) analysis. It breaks a pitch sample down into typical pitch chemical families —triglycerides, fatty acids, rosin acids, sterols, and steryl esters. But it also overstates the representation of actual wood pitch. That's because it includes other materials in the total extractives results. This deposit sample is shown to contain 17.75% DCM extractives. But take a closer look. Total pitch components are less than that, at 13.04%.

CASE STUDY #1

The Challenge: A large North American pulp mill wanted to expand into low-ash pulp markets. To accomplish that, they needed to eliminate talc and maintain very low dirt counts (<1 ppm). At the time, they were using a combination of a dispersant — Buckman's Busperse® 248 — and talc.

The Solution: Buckman® 280 was dosed at 13% of the talc feed rate (with a ratio of about 7.5 to 1), and talc was eliminated.

The Result: The mill successfully maintained quality parameters and produced low-ash pulp.

CASE STUDY #2

The Challenge: A South American eucalyptus mill was interested in producing low-ash pulp.

The Solution: Buckman 280 was dosed at a feed rate of about 9% of the original talc feed rate.

The Result: The mill successfully maintained quality parameters, and colloidal pitch counts decreased.

About the Author

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