

Contaminant Control

Master Screen Display ...

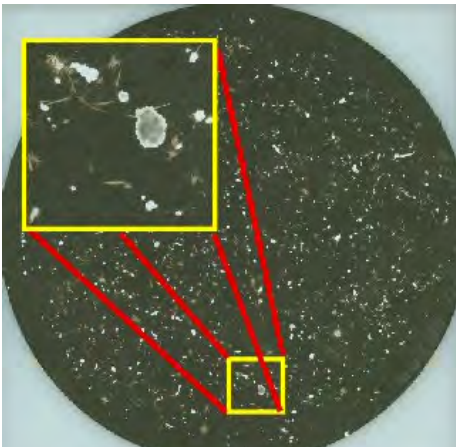
Shives and Dirt



A White 210 mm (8") filter paper showing a magnified view of shives and dirt (bark) rejects from groundwood pulp separated from good fiber by the Pulmac Master Screen. Filter paper displays can be ready for analysis 30 minutes after starting the Master Screen test cycle.

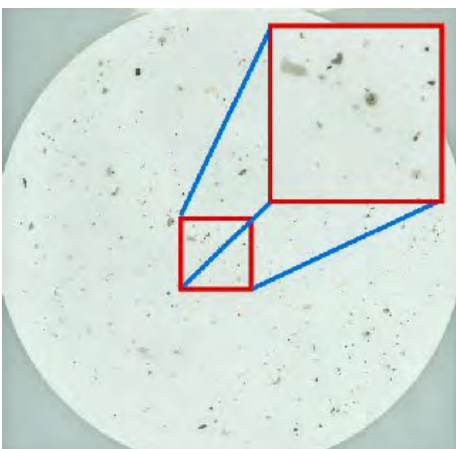
Because they have distinctly different shapes, shives and dirt can be measured and reported as distinct classes by the Verity IA Master Screen image analysis system following a single scan of the entire filter paper.

Shives and Stickies

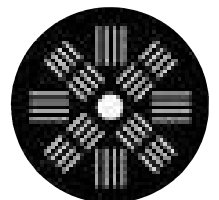


Black contrasting filter paper with a magnified view of stickies and shives. A pressure sensitive paper coated with calcium carbonate is placed over the filter paper and the two are pressed and heated. The stickies melt and the calcium carbonate adheres to them, turning them uniformly white. Now with distinct shapes and colors, stickies and shives are measured and reported as separate classes by the Verity IA Master Screen image analysis system with a single scan of the entire filter paper.

Stickies



White filter paper showing magnified view of stickies that have adhered to a clear Mylar sheet that was run through an office laminator with the filter paper containing both stickies and non-sticky matter. When this filter paper is removed from the Mylar sheet the stickies remain stuck to the Mylar. The residual non-sticky material is brushed away leaving the stickies. Prior to measurement and classification of the stickies by the Verity IA Master Screen software, a clean filter is placed behind the stickies.



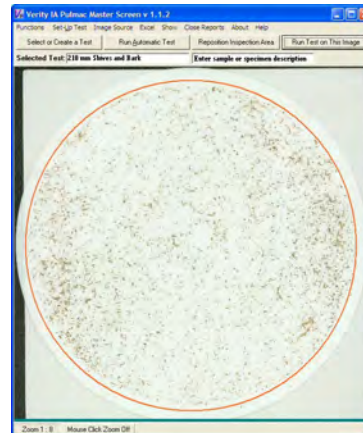
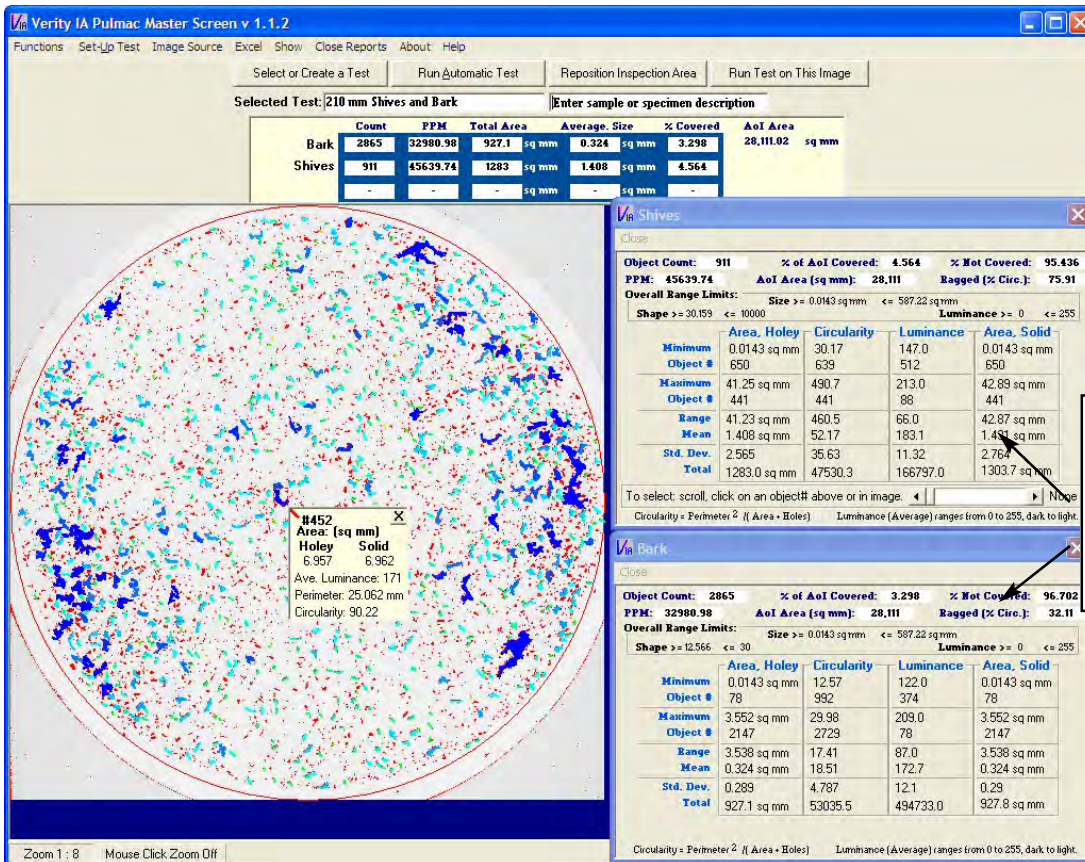
Contaminant Control

...Image Analysis

Master Screen Module

This program measures shives, bark, dirt, stickies and other contaminants separated from a sample pulp slurry by the Pulmac Master Screen. The Master Screen deposits reject material on a conventional white or black 210 mm (8") filter paper. These contaminants are then measured by the Verity IA system for size, the area covered by each item, and their shapes (circularity). Once measured, the contents are classified by shape into bark or dirt and fibrous materials (shives). Each category, bark (or dirt) and shives is counted separately.

The Pulmac/Verity system can also measure stickies content of recycle pulps. With a simple heat, pressure and pre-treatment procedure to separate dirt and fiber from stickies a repeatable stickies count is easily obtainable.

	Count	PPM	Total Area	Average Size	% Covered	AoI Area
Bark	2865	32980.98	927.1 sq mm	0.324 sq mm	3.298	28,111.02 sq mm
Shives	911	45639.74	1283 sq mm	1.408 sq mm	4.564	

	Area, Holey	Circularity	Luminance	Area, Solid
Minimum	0.0143 sq mm	30.17	147.0	0.0143 sq mm
Object #	650	639	512	650
Maximum	41.25 sq mm	490.7	213.0	42.89 sq mm
Object #	441	441	88	441
Range	41.23 sq mm	460.5	66.0	42.87 sq mm
Mean	1.408 sq mm	52.17	183.1	1.457 sq mm
Std. Dev.	2.565	35.63	11.32	2.764
Total	1283.0 sq mm	47530.3	166797.0	1303.7 sq mm

	Area, Holey	Circularity	Luminance	Area, Solid
Minimum	0.0143 sq mm	12.57	122.0	0.0143 sq mm
Object #	78	992	374	78
Maximum	3.552 sq mm	29.98	209.0	3.552 sq mm
Object #	2147	2729	78	2147
Range	3.538 sq mm	17.41	87.0	3.538 sq mm
Mean	0.324 sq mm	18.51	172.7	0.324 sq mm
Std. Dev.	0.289	4.787	12.1	0.29
Total	927.1 sq mm	53035.5	494733.0	927.8 sq mm

At left is a typical evaluation to monitor screening efficiency or refiner performance.

The Pulmac Master Screen program has analyzed the scanned filter paper display for:
1- shives and
2- bark.

