

Characteristics of wire and felt side in a finished sheet of paper

Fines, aka white water - finely divided matter: cellulose, hemicellulose and additives (MgCO₃, fillers, pigment, etc.)

Using fines and fiber grain to determine wire side vs felt side:

During sheet formation, pulp (furnish) flows across the mould in a direction perpendicular to the wire lines covering the mould. Initially, when the pulp begins to impact the mould surface, the fines fall through the screen; very quickly thereafter a fiber mat starts to form, trapping the fines on the upper side of the sheet (the felt side). The vatman shakes the screen side to side and forward to back, creating a multidirectional 'grain.' A more pronounced grain direction is found on the wire side and a more random fiber orientation is found on the upper, felt side.

Note: Machine-made paper is only shaken side to side, creating a more pronounced grain directionality.

Note: Freer pulp retains less fine matter (cellulose and mineral fines) than highly processed pulp.

Under a Microscope:

Wire side:

Chain lines indented (if visible).

Fibers are more aligned, like combed hair (in parallel to the swirl of pulp in the vat, combined with the direction of the vatman's dip).

More fibrous due to fewer fines.

Felt side:

Fibers more random;

More fines result in areas where the "normal" fibers are hidden by or mixed with smaller, shorter fibers.

