Checklist for Using Fybrel™ Synthetic Pulp

Fybrel™ fibrillated polyolefin pulp has been used in many commercial papermaking systems and other systems designed for handling fibers. Runability of Fybrel™ has been very good; few problems have been experienced. This checklist is designed as an aid for planning and conducting trials in a wet process.

DISPERSION

- Many applications can tolerate some fiber bundles. Dispersion is then less critical, and conditions can be adjusted accordingly.
- Union pulping: Add Fybrel™ to pulper, disperse, and then add wood pulp.

A. CONSISTENCY
   * Recommend 2.0 to 3.0 wt% for first trial.
   (A Fybrel™ slurry is slightly more viscous or heavier than a wood pulp slurry of same consistency.)

B. TEMPERATURE
   * Dispersion quality improves as water temperature increases.
   (Temperature for optimum dispersion is 50°C.)

C. TIME
   * Depends on temperature, consistency, Fybrel™ grade or type, pulper design and dispersion quality needed.
   (30 minutes is typical for good dispersion quality with E-400, 3% consistency and 50°C.)

D. TEST
   * View diluted sample in glass cylinder or on blue glass.
   (Addition of a thickener to increase viscosity greatly aids visual inspection of dispersion quality.)

E. DEFLAKER OR DISC REFINER
   * A deflaker or disc refiner at low power can substantially improve dispersion quality.

REFINING

- Fybrel™ pulp does not need refining.
- Cutting type of refining can shorten the Fybrel™ fibers (not desired). Brush refining can entangle or fuse the Fybrel™ fibers if plate clearance is too small or power input too high. Use visual test to check for fiber damage (see item D under DISPERSION).

A. REFINING PROCEDURES
   * Best method is to add Fybrel™ pulp to pre-refined wood pulp.
   (Especially important if wood pulp is heavily refined)
   * Blends of wood pulp and Fybrel™ can be refined.
Disc refiners have given best results. Too heavy refining can cause fiber bundles.

B. MACHINE REFINING
* Generally gives no problems.
* Heavy refining can cause fiber bundles.

PAPER MACHINE
- Fybrel™ pulp behaves much like wood pulp, but is also plastic and thus sensitive to temperature and pressure.
- A certain machine clean-up frequency is associated with every paper grade. Furnishes containing Fybrel™ pulp will also have characteristic machine clean-up frequencies. This is frequency must be determined by experience for each machine and grade in the same manner as with all-wood pulp furnishes.

A. WET END
* May need small adjustments in headbox consistency, foils and vacuums.
* No problems with trim or wet broke.
* Very occasional problems have occurred with wire release from Fybrel™ fibers sticking into wire.

B. PRESSES
* Usually no problems if the wood pulp furnish does not pick.
  (Fybrel™ pulp furnishes generally have slightly more picking tendency than all-wood pulp furnishes.)
* Normal cleaning (showers, doctors) is effective with Fybrel™ pulp.

C. DRYERS
* Fybrel™ pulp melts at 125 to 135°C (E-type Fybrel™), 105 to 125°C (UL-type Fybrel™).
  * Recommend maximum dryer temperature of 115°C (E-type Fybrel™), 105°C (UL-type Fybrel™).
  (At least during early trials until experience is gained)
  (Web temperature will not exceed about 100°C until almost dry.)
* Sticking occurs if dryer too hot.

D. YANKEE DRYER
* Too high temperature can cause sticking.
  (Maximum temperature depends mainly on web moisture leaving Yankee, Fybrel™ pulp content, furnish, and dryer surface condition.)
* Recommend starting with low temperature (e.g. 85°C) and gradually increasing.
  (Properly fitting doctor is important.)

E. FRICTION POINTS
* Contact between stationary items and the moving web will generate heat and cause formation of plastic needles. Controls are:
  1) Remove friction point
  2) Limit heat buildup by web speed, tension, or external cooling.

F. CALENDER
* Normally use lower loading than with wood pulp.
* Too hot rolls can cause sticking.
* Reduce web moisture in proportion to Fybrel™ pulp content.

WINDING AND CONVERTING
- Webs containing Fybrel™ pulp have performed satisfactorily on a wide variety of converting equipment: coaters, printers, laminators, extrusion coaters, die cutters, envelope machines, board molding machines, presses, embossers, etc.

A. FRICTION POINTS
* Plastic needles form if heat generation is sufficient (see item E under PAPER MACHINE).
  (Tendency toward needle formation decreases as the paper roll cools)
* Slitters should run slightly faster than the web.
  (Plastic film can form around stationary or high speed slitters.)

B. SPLICING TAPE
* Avoid heat-sensitive tape (melts Fybrel™ pulp during tape application).

C. HEAT TREATMENT
* Sticking may occur between the dry web and surfaces heated about 110°C (E-type Fybrel™), 100°C (UL-type Fybrel™).

REPULPING
* Repulping is possible provided the Fybrel™ fiber has not been fused or melted by high pressure or temperature. Recommended conditions are:
  (1) Heated water (up to 70°C).
  (2) Maximum agitation.
  (3) Gradual loading of broke.
  (4) Lower consistency and/or increased pulping time.

Fybrel™ Fibrillated Polyolefin Pulps available from

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