

NOTES ON USE / SWP™ Synthetic Pulp

(Wet End Papermaking Process)

SWP™ is a hydrophilic fibrillated fiber made from polyolefin. SWP™ is a high performance material in wet end papermaking processes. General type papermaking machine is used for papermaking with 100% SWP™ or mixture of SWP™, pulp, etc.

1. DISINTEGRATING

SWP™ sheet has 3~6mm thickness and water content of the sheet is usually 40~70%. SWP™ has hydrophobic properties compared with wood pulp, therefore the disintegrating/dispersing conditions of SWP™ in water (generally pulpers or beaters are used) are a slightly different compared with the DISINTEGRATING / dispersing conditions of wood pulp. As a note on use, we recommend the following conditions.

A) DISINTEGRATING TEMPERATURE

Recommended water temperatures for optimum disintegrating are 40~60°C. (SWP™ is slightly difficult to refine compared with wooden pulp.)

B) DISINTEGRATING CONCENTRATION

Recommended disintegrating concentration is 1~3wt%. The optimum disintegrating concentrations are different depending on SWP™ grade.

C) DISINTEGRATING TIME

Recommended disintegrating time is 10~30 minutes. Recommended disintegrating time of easy disintegrating SWP™ grade (ex. E620) is 20 minutes or less.

We recommend checking the disintegrating state of SWP™ by viewing distilled sample in a graduated cylinder.

We do not recommend excessive disintegrating time, as it will induce intertwining of SWP™ fiber (called "YORE" in Japanese).

D) DISINTEGRATING MACHINE

Recommended disintegrating machine is a pulper.

If using a beater for disintegrating SWP™, one without weight is recommended.

2. REFINING

- SWP™ does not need refining, as it has already been fibrillated.
- Cutting type refining can shorten the SWP™ fibers (not desired). Brush refining can entangle or fuse the SWP™ fibers if plate clearance is too small or power input is too high.

3. PAPERMAKING

A) FLOATING and FLOCCULATION of SWP™ FIBERS

- SWP™ will float due to the light specific gravity on water, if you do not stir mechanically for ten minutes (FLOATING).
- SWP™ of comparatively long fibers tends to move horizontally and gather them (FLOCCULATION).
- In the upper two cases, it returns easily to the former dispersion state if little mechanical power (ex, stirring) is added the slurry. When using SWP™ with wooden pulp, if mixed enough, these problems decrease further as the difference in the specific gravity of the intertwined fibers group with water is small. We recommend stirring weakly as much as possible after the fiber dispersing is finished as strong stirring of the slurry induces intertwining “YORE”.
- When you cannot cancel the state of floating and flocculation in wet end, we recommend adding a certain dispersant in wet end. The effective dispersant retains fibers according to the increased viscosity of the slurry or cationic type.

B) DIRT of FELT

- SWP™ tends to be blocked in the space of the felt. Strong washing of felt of the papermaking machine is necessary when using only wood pulp.

C) DRYERS

- Dryer temperature control is very important for making SWP™-based synthetic fiber paper to avoid property changes in the paper by dryer heat.
- Resinoid may be generated on the dryer if it is too hot (generation of sticking) . Recommended temperature of the dryer is 20°C (desirably 30°C) or much lower than the melting point of SWP™. For example, in the case of using E620 the recommended temperature is 95~110°C.
- Recommended dryer type is a Yankee dryer because dirt can be easily removed.
- When multi-cylinder is used as a dryer, it is recommended that the cylinder temperature of the wet end side is kept low as possible and the cylinders' temperatures toward the reel side rises gradually to the right temperature.
- When heavy sticking occurs in dryers, an internal release agent (ex, SUNTORL KL, NICCA CHEMICAL.CO., LTD) or external release agent (ex, Industrial salad oil “DIVIDER OIL”) is recommended.

4. WINDING UP

- Special consideration is not necessary.
- If a high speed papermaking machine is used, avoid sliding part heat to avoid melting by frictional heat. When unavoidable, cool the sliding part by air.
- Slitters hold run slightly faster than the web.

5. HEAT TREATMENT (POST-PROCESSING)

- In the case of heat treatment of SWP™-based synthetic fiber paper, the temperature of the heat treatment is recommended under 5 to 10°C of the melting point of SWP™. (Example; in the case of using E620 the heat treatment temperature is 125 to 130 °C.)
- When the treatment temperature is over the melting point of SWP™, the paper will be made transparent as film. The paper is not ventilated easily, that is, the permeability value of the paper will be high.

6. REPULPING

- Repulping is difficult provided the SWP™ fiber has been fused or melted by high temperature (generally 70°C and more).

To the best of our knowledge, the information contained herein is accurate.

However, we cannot assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Mitsui Chemicals, Inc.

Synthetic Wooden Pulp Department, Nonwoven Fabric Division
Shiodome City Center, 1-5-2, Higashi-Shimbashi, Minato-ku, Tokyo 105-7117, JAPAN
TEL 03-6253-3651 FAX 03-6253-4226