



Graver Technologies

## Application Brief

LIQUID PROCESS FILTERS GRAVER TECHNOLOGIES 1-888-353-0303

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AB-003

### **Filtration Opportunities in Pulp and Paper**

Pulp and Paper mills have not historically been a favorite target of distributors selling the higher performance cartridge filters. This has been predominantly a bag filter application or, at best, resin bonded filters. However, it is worth taking a second look since Graver has uncovered the following lucrative opportunities for cartridge filters in pulp and paper mills:



#### **Bleaching Chemicals**

Modern Mills have moved away from using chlorine as a method of bleaching the pulp stock, and have adopted methods that produce the powerful oxidizing agent Chlorine Dioxide (ClO<sub>2</sub>). The ClO<sub>2</sub> production process involves the reaction of Sulfuric Acid, Sodium Chlorate, and Methanol, diluted into water to 8 to 10 g/L.

This process is very reactive and has to be very carefully controlled in a vacuum. Undesirable impurities, which include oxidizable substances such as reactive metals, rust, dust and organic contaminants such as hydrocarbon greases, oils and rubber, can make the reaction unstable and more sensitive to 'puffs', (essentially mini explosions in the reaction vessel).

**Sulfuric Acid** - Sulfuric Acid is typically delivered in tank cars and stored in tanks where it can pick up rust and scale. If these contaminants are not removed, it can lead to 'puffs' in the reaction chamber. Some mills will use string wound, but because string wounds are notorious at unloading contaminant, they can lead to slugs of captured contaminants entering the reaction, which can lead to 'puffs'. High efficiency melt blown filters provide improved contaminant removal.

**Graver recommends Stratum C or Stratum A Series high efficiency melt blown filters in 10 to 30 microns.**

**Sodium Chlorate and Methanol** - These base chemicals also pick up tank rust, scale and other debris and should be filtered before use for reasons explained above.

**Graver recommends Stratum C or Stratum A Series high efficiency melt blown filters in 10 to 30 microns for Sodium Chlorate.**

**For Methanol Graver recommends Stratum A Series 1 micron.**

Most mills will filter the above chemicals as they are unloaded from truck or rail cars and may filter again before feeding into the reaction vessel. In cold weather the chemicals are often more viscous. Stratum filters, which feature the molded Cactus Core, deliver exceptional collapse strength, so are the ideal solution to prevent filter collapse under these more adverse conditions.

## Water

**Incoming Water** - Copious volumes of water are used in the paper mill every day. Many mills draw their water from a surface source. Those plants located in colder climates see an increase in the amount of silt in the water during the spring runoff or snow melt period, resulting in an explosion in filter usage. Many paper mills will employ RO membranes. These are typically protected by multi stage prefilters which may include baskets, bags and melt blown filters.

**Graver recommends MBF Series 5 micron filters for pre RO filtration**

**Water knives** - The mill uses water knives to trim the rough edges off the paper (Trim Squirt application) and also to cutoff at the end of a roll (Tail cutters). These water knives features fine orifices which can easily clog if particulate is not removed from the water, causing plant downtime, and wasted pulp stock. In addition, finer particulate, that does not plug the nozzle, could cause erosion of the orifice, necessitating premature replacement of the nozzle.

**Graver recommends Stratum C Series 10 micron filters for water knife applications. For hot trim squirt applications, high temperatures dictate the use of RTEC Series resin bonded filters in 10 micron.**

**Spray nozzles** – As the newly formed paper moves down the line it must be kept wet so it does not break. Spray nozzles are used to apply water to the paper. If the water contains particulate, the nozzles can plug, causing the paper to dry and break. The result is loss of production time, replacement of nozzles and difficulty restarting the line. Point of use filters should be employed to remove contaminant that can plug nozzles.

**Graver recommends Stratum C Series 10 to 50 micron filters to prevent nozzle plugging, in a single cartridge housing close to the nozzles.**

**Eye Wash Stations** - Paper Mills are extremely safety conscious and eye wash stations are located throughout the plant site. A medium size mill could have many stations and filters are typically changed monthly or quarterly on a maintenance schedule. Some mills have been using resin bonded filters for this application, an extremely poor choice since fiber and resin particles can release from the filter and be projected into the employees' eyes.

**Graver recommends 1 micron MBF Series filters for this application.**

## Seal Flush

Paper machines run at speeds up to 75 mph thereby putting a lot of stress and wear on bearings and moving parts, in addition to generating a lot of heat. The cooling water that is used must be filtered to prevent contaminants from eroding the seals of rotating equipment such as pumps and refiners. The filters ensure that particulate in the cooling water, such as sand or silt, is removed to prevent wearing of the packing sleeve, and pre-mature failure that leads to downtime. See Graver Application Brief 001 for more detail on Seal flush applications.

**Graver recommends Stratum C Series 25 or 50 micron filters for seal flush applications.**

## Paper Additives

Many additives are used in paper production, especially when higher quality papers are being produced such as for magazines or ink jet printing. These additives may agglomerate and can mar the smooth finish that is desired.

**For pigments, depending on type, Graver recommends up to 100 micron Coax Series filters.**

**For dyes, Stratum A 10 to 20 micron is recommended.**

**For latex, use 50 micron RTEC or Stratum C**

## Conclusion

Pulp and Paper mills have numerous filter applications for Graver liquid process filters and can benefit from the superior performance of Graver's Stratum, MBF, Coax and RTEC Series filters.



**Stratum A Series**