

Winder Trimming

a case study

By L.R. Roberge and B. Doure



Today, paper trim on the operating floor is no longer an issue at Weyerhaeuser's board mill in Sturgeon Falls.

Weyerhaeuser's board mill in Sturgeon Falls, Ontario produces 95,000 mt/y of corrugated medium. The mill operates one paper board machine and utilizes an in-line 151 inch wide Cameron winder, with trimming stations on the tending and drive side.

THE PROBLEM: Paper trim from the winding operation, was pneumatically conveyed via a chopper fan and ducting and re-introduced to the dry end pulper. The pulper accepted trim and the accompanying motive air from two sources - the winder and a web welder. The pulper was not equipped with an exhaust system and consequently some of the moisture laden paper fragments from the chopping operation would continually exit the operating floor pulper opening with the excess air. The wet paper fragments would settle on the operating floor creating concern for safety as they introduced a slipping hazard for the operating crew.



In many paper mill machine rooms, paper trim on the operating floor can often create both safety and housekeeping concerns.

The presence of the paper fragments on the operating floor also became a housekeeping issue.

The machine crew and management wanted a solution to the problem. A solution was sought that would not jeopardize the trimming operation, not create more work for maintenance crews, not consume more power and not increase the noise level in the machine room. The mill also wanted to speed up the winder by 1000 fpm.

INVESTIGATION: One possible solution to decrease the flow of chopped trim out of the pulper was to introduce a pulper exhaust system. This meant installing another fan, motor (requiring additional energy), and ducting, in an old mill with limited space or head room at the pulper. The exhaust system would need to be designed flawlessly to avoid paper fragment blow-outs while avoiding carryover into the exhaust system itself. The mill was not certain that this goal could be achieved.

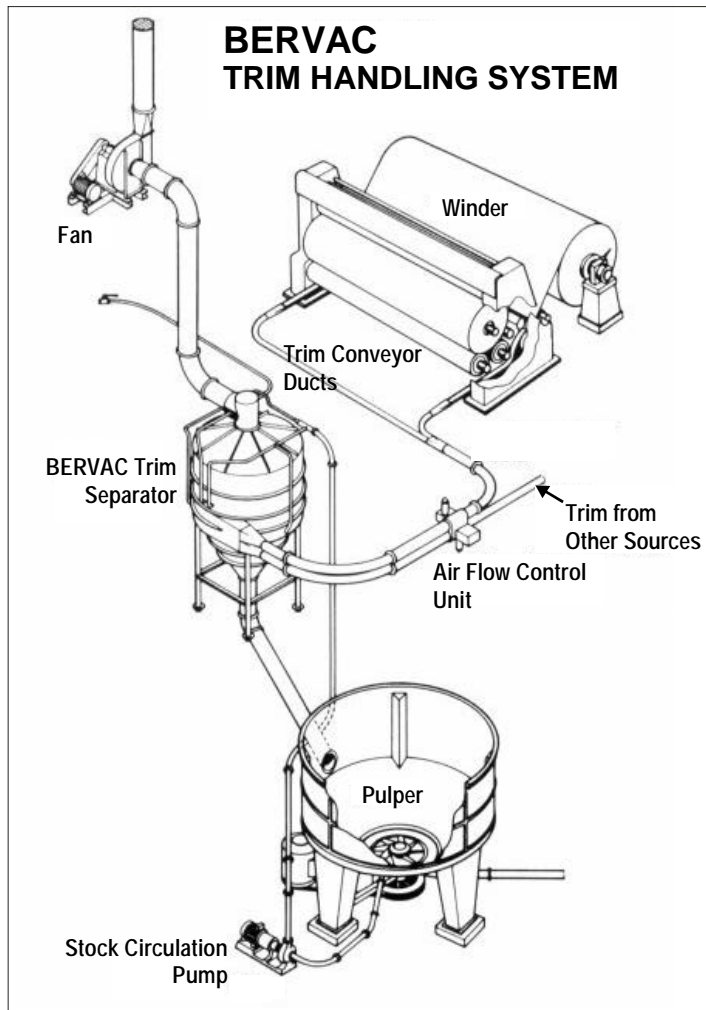
Another option was investigated; the replacement of the existing trim conveying system with a vacuum trim handling system which would eliminate the introduction of air into the pulper altogether. A system called BERVAC (supplied by EPM Tech Ltd.) is such a system. The trim (conveyed under vacuum conditions) enters the pulper below the liquid level through an air-lock seal. Hence, there is no possibility for paper trim blow-outs.

The **BERVAC Vacuum Trim Handling System** operates on a principle where the paper trims are conveyed unbroken in ducts under low vacuum from a winder or the like to a pulper. The trim is separated from the air stream in a separator, using stock or white water. The separator is connected to the pulper by means of a discharge pipe. This connection to the pulper is made below the pulper stock level, which forms an air lock in the discharge pipe. No mechanical rotary feeder or similar trim feed equipment is required. The stock and white water used to flush the paper entering the separator down into the pulper is typically taken from the pulper circulation and supply lines. The air flow required for trim conveyance is produced with a standard centrifugal fan. The fan exhaust air is reintroduced back into the machine room.



Space limitations were overcome by placing the separator and fan on a new mezzanine on the operating floor on the winder drive side.

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A number of winders may be served by a single BERVAC system. The BERVAC trim conveying system is suitable for the handling of practically all types of paper broke which allow pneumatic transport.

SOLUTION: The mill decided to install a BERVAC System. EPM sent a representative to the site to help the mill realize the benefits of the BERVAC System and to implement a custom design.

The new BERVAC system utilized a 20 HP centrifugal fan whereas the previous system used a 75 HP chopper fan. The new system required the installation of a new stock circulation pump equipped with a 20 HP motor. This left an overall energy savings of 35 HP per year.

On start-up, the mill learned quickly that pulper consistency was an important element to the operation of the BERVAC System. This resulted in lowering the average consistency in the pulper to allow adequate and continuous circulation of stock to the separator. Energy savings were realized by installing the BERVAC System but could not be readily quantified by the mill because of the change in operating parameters at the pulper.

SUMMARY OF ADVANTAGES AND DISADVANTAGES: The BERVAC System offered the following advantages to the mill:

- Elimination of housekeeping and safety issues resulting from wet paper fragments on the operating floor
- Energy savings
- The installation of a variable speed drive on the fan allowed better control of the tension on the trim web at the start of the wind and at the end. This can in some cases, result in lower noise levels at the trim chute as well as improved roll end appearance due to reduced tearing during these periods.

The system drawbacks were related to cost. For example:

- Space limitations resulted in placing the separator and fan on a new mezzanine on the operating floor on the winder drive side, resulting in additional costs.
- New trim chutes were required because air flow rates were considerably lower than the existing system, resulting in additional costs.

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