

Dye Injection for Online Color Control

THE TARGET GROUP?

Paper mills producing tissue paper, fine papers (bond, cover, text, envelope, etc.), coated paper, newsprint, directory paper, and specialty grades.

CUSTOMER CONTACT(S):

Stock Prep Supervisor, Paper Machine Supervisor, Engineering Manager.

WHY MIGHT THEY BE INTERESTED IN A BRAN+LUEBBE SYSTEM?

- Color matches are improved, and shade variations are reduced within production runs.
- Color fluctuations and incoming pulp stock colorability problems (especially with secondary fiber stock) are eliminated.
- Production time and costs incurred during grade changes are greatly reduced.

BRAN+LUEBBE'S SOLUTION:

A Bran+Luebbe metering system continuously adds the proper amount of dye to incoming paper stock. On-line color sensors and computers determine paper color and convert this information into numerical values. A color computer compares the numerical values to target values, calculates any differences, then sends appropriate signals to the stroke length controllers to adjust dye flow rate(s). Refer to the diagram on the next page.

WHAT ARE THE BENEFITS?

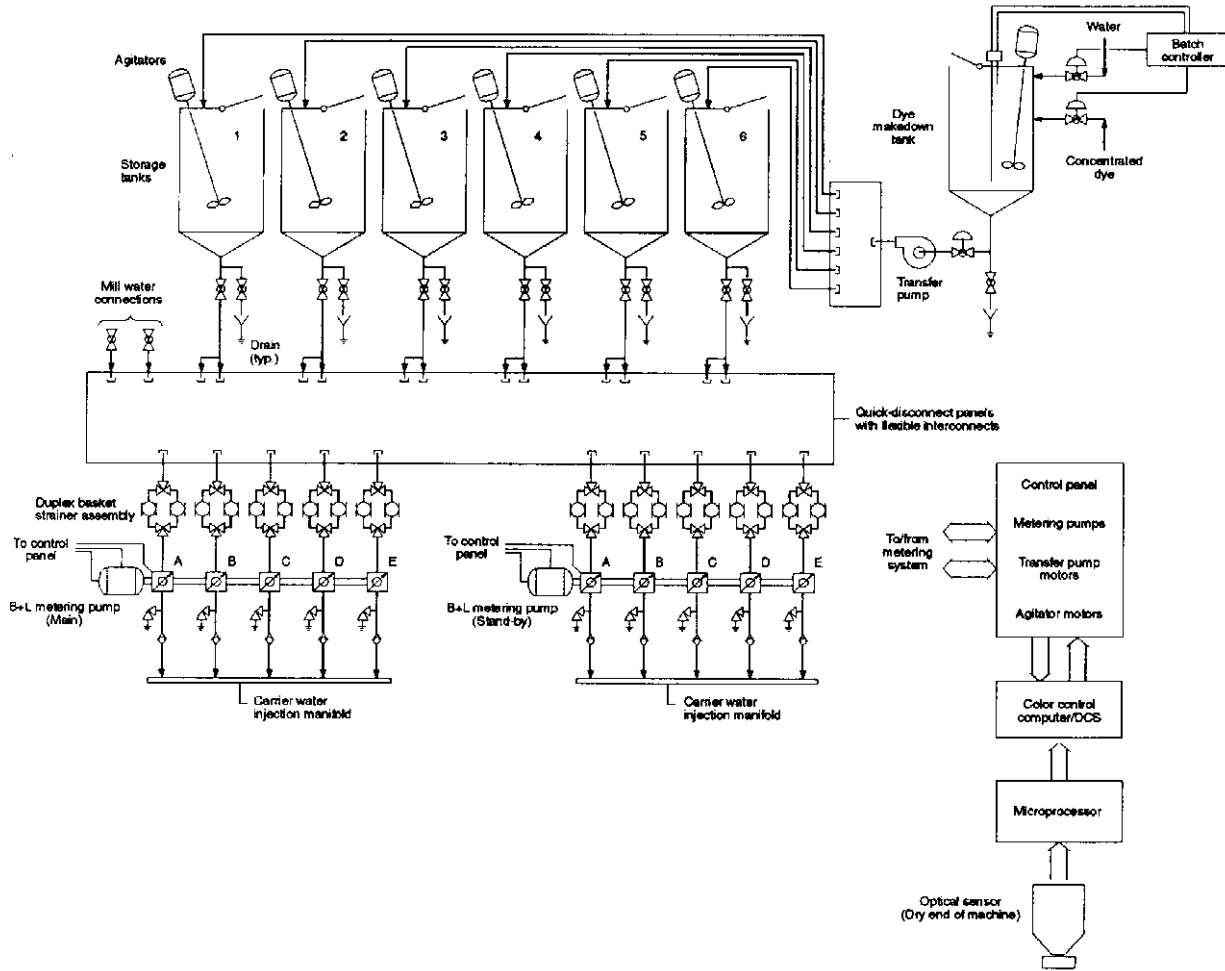
- Reduced color and grade change time lowers production costs and increases production levels.
- Off-color paper production is reduced, lowering costs and decreasing lost production time.
- Dye use is minimized. Consistent production improves end-product quality.
- Operator safety is improved.

PRICING: \$20,000 to \$250,000 depending on the level of technology incorporated, the number of dyes and ingredients used, and overall production level.

COMPETITORS: American Lewa.

BRAN+LUEBBE CONTACT:

TYPICAL DYE INJECTION SYSTEM



System Application

Inline Wax Emulsion Manufacturing

WHO IS A POTENTIAL CUSTOMER?

Paper coatings manufacturers and chemical suppliers.

WHY WOULD A MANUFACTURER BE INTERESTED?

Process engineers.

WHY MIGHT THEY BE INTERESTED IN AN EMULSION SYSTEM?

- Accurate emulsion production reduces operating costs and increases product consistency.
- Production capabilities are increased.
- Reduced operator interface.
- Useable floor space is increased because batch tanks are not required.

BRAN+LUEBBE'S SOLUTION:

- A metering pump proportions individual components (refer to the schematic on the next page).
- Once the ratio is established, the liquid is sent through a high-shear in-line mixer, producing a course (3μ - 10μ) emulsion.
- A homogenizer further decrease the particle size to as low as 0.1μ .
- Once its temperature is stabilized, the emulsion is sent directly to storage or transportation containers.

WHAT TECHNOLOGY DOES THE CUSTOMER CURRENTLY USE?

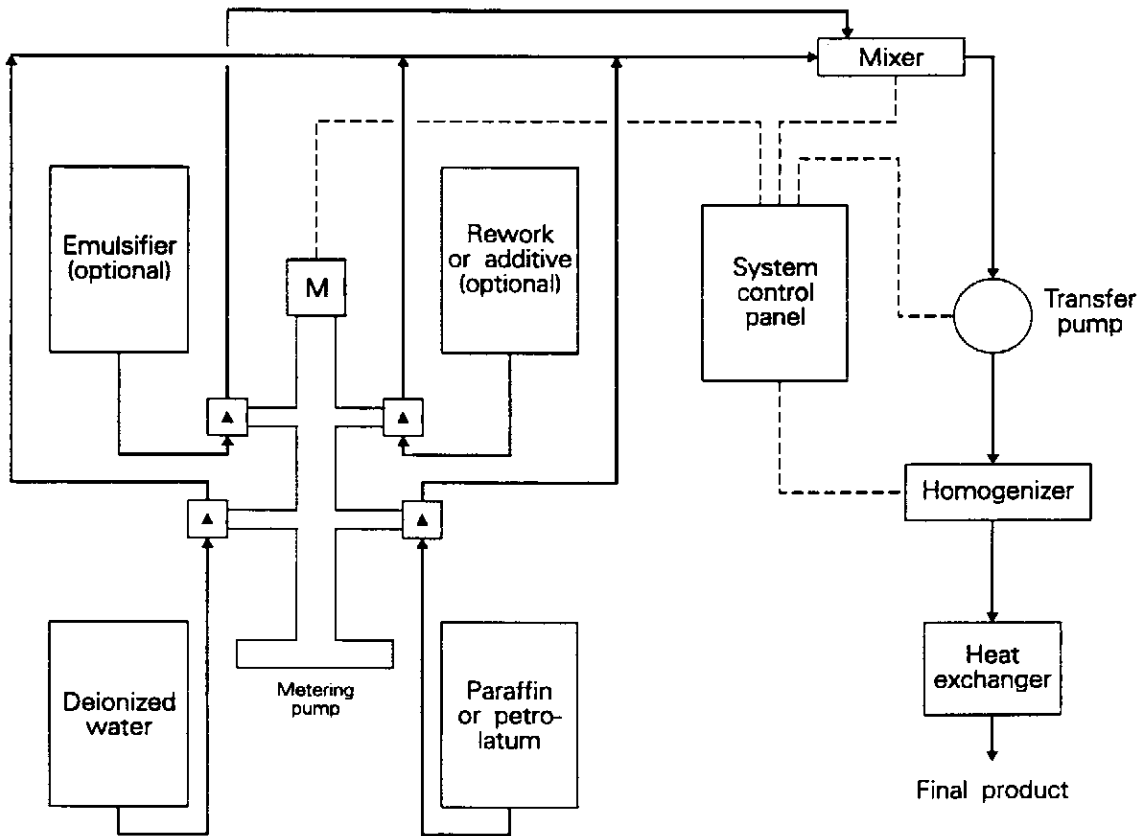
A batch production system using batch tanks and time-consuming high-energy mixers.

PRICING:

\$300,000 to \$400,000 for a 40 gpm system.

BRAN+LUEBBE CONTACT:

EMULSION SYSTEM SCHEMATIC



System Application

Bleaching/Paper Making Systems

THE TARGET GROUP?

- Pulp and paper mills.
- Engineering firms that service the pulp and paper industry.

CUSTOMER CONTACT(S):

- Stock preparation superintendent.
- Engineering manager.

WHY MIGHT THEY BE INTERESTED IN A BLEACHING/PAPER MAKING SYSTEM?

- They want to save money on chemicals and manpower.
- They want to minimize operator contact with aggressive or hazardous chemicals.
- They want to correct inconsistencies in bleaching preparations.

BRAN+LUEBBE'S SOLUTION:

- A Bran+Luebbe multi-headed metering pump for chemical preparation/addition.
- Produce only required amount of bleaching agent by pacing pump motor speed.
- Automated equipment allows for unattended operation.

WHAT ARE THE BENEFITS?

- Accurate metering decreases raw material use.
- Eliminates batch tanks.
- Mix proportion changes are quick and convenient.
- Increases product consistency.
- Increases operator safety.

WHAT EQUIPMENT (PROCESS, SYSTEM, ETC.) DOES THE CUSTOMER CURRENTLY USE?

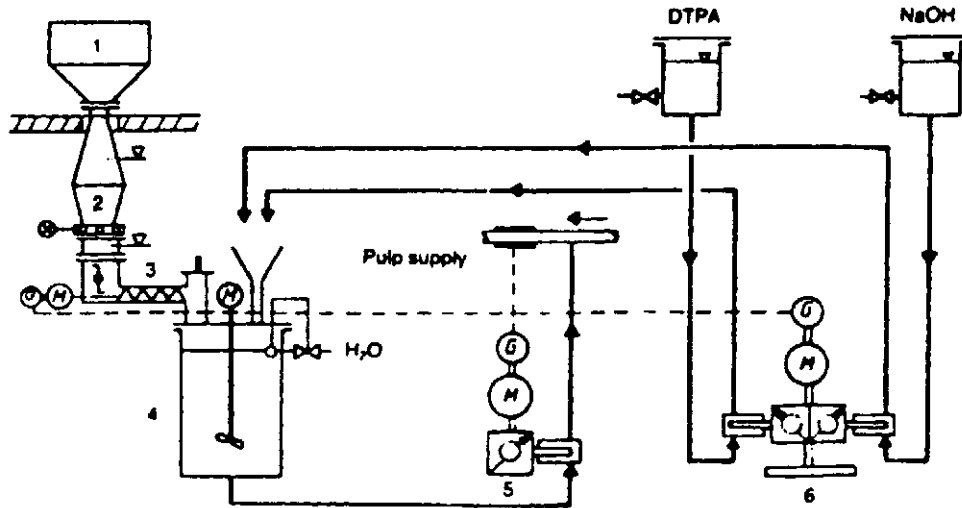
Batch equipment; throw-away single-headed pumps and/or flow control valves.

PRICING:

\$20,000 to \$100,000 depending on scope of supply.

COMPETITORS:

- In-house engineering departments.
- Consulting engineering firms utilizing on-site construction.

TYPICAL MECHANICAL WOOD PULP BLEACHING


- | | |
|---------------------------|---------------------------------|
| 1) Hydrosulfite Container | 4) Dilution Tank |
| 2) Sensing Element | 5) Hydrosulfite Metering Pump |
| 3) Screw Feeder | 6) Caustic & DTPA Metering Pump |

System Application

De-Inking/Paper Recycling

THE TARGET GROUP?

- Pulp and paper mills with recycling facilities.
- Engineering firms that service pulp and paper mills.

CUSTOMER CONTACT(S):

- Stock preparation superintendent.
- Engineering manager.

WHY MIGHT THEY BE INTERESTED IN A BRAN+LUEBBE SYSTEM?

- They are expecting problems with handling sodium silicate.
- Their current methods are unreliable and inaccurate.
- They want to save money on equipment adjustments and maintenance repairs.

BRAN+LUEBBE'S SOLUTION:

- Continuous, accurate, and repeatable chemical addition utilizing a Bran+Luebbe metering system.
- Centralized chemical storage and distribution.
- Automated equipment allows for unattended operation.

WHAT ARE THE BENEFITS?

- Operator safety.
- Continuous addition of sodium silicate eliminates the need to flush lines.
- Durable and precise equipment minimizes maintenance and operator attention.
- Accurate metering yields chemical savings.
- Increases product consistency and injection rate adjustment time.

WHAT EQUIPMENT (PROCESS, SYSTEM, ETC.) DOES THE CUSTOMER CURRENTLY USE?

CUR-

Batch equipment; throw-away pumps provided by chemical manufacturers.

PRICING:

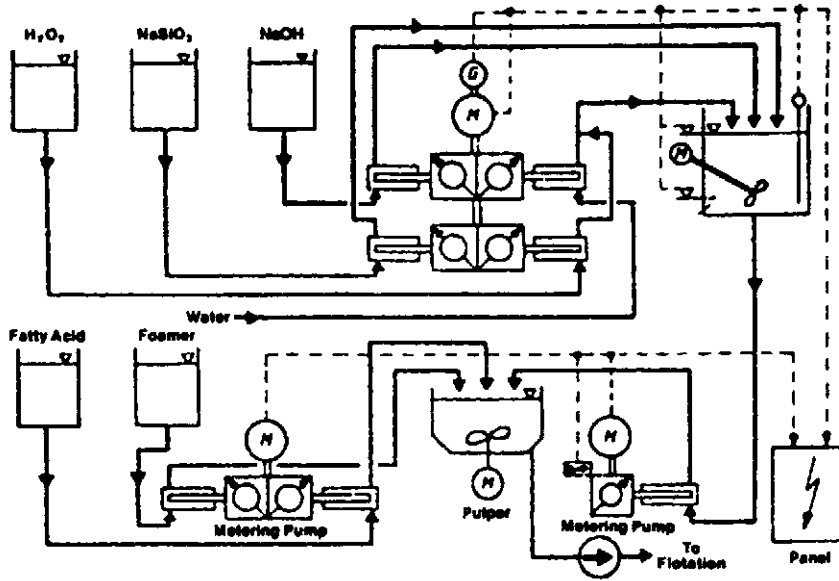
\$20,000 to \$200,000 depending on project scope.

COMPETITORS:

Cellier, Fluor Daniel (Note: This equipment is typically a small portion of the de-inking facility).

BRAN+LUEBBE CONTACT:

CHEMICAL PREPARATION FOR DE-INKING



System Application

Paper Coatings Preparation: Coatings Kitchens

THE TARGET GROUP?

- Paper manufacturers that coat on- or off-line.
- Paper converters that coat paper.

CUSTOMER CONTACT(S):

Paper Machine Superintendent, Engineering Manager, Coater Supervisor.

WHY MIGHT THEY BE INTERESTED IN COATING KITCHENS?

- They have problems with coating formulations, incomplete mixing, and coating components dispersion.
- Large batch volumes make coatings adjustments inefficient, and cause excess coating production/waste.

BRAN+LUEBBE'S SOLUTION:

- Apply a metering pump to continuously proportion raw materials.
- In-line blending optimizes coating adjustments and changeover times, and allows for individual control of additives, binders, and pigments.
- Coatings production based on the demand of the paper machine or the off-line coater.

WHAT ARE THE BENEFITS?

- Just-in-time coatings production reduces the amount of in-process chemicals.
- Adjustments, either manual, or automatic, to coating formulation are simple and produce immediate effects to the coating.
- Minimize rework, waste, and raw material use through accurate proportioning.

WHAT PROCESS DOES THE CUSTOMER CURRENTLY USE?

Batch tanks with high shear agitators. Plugged lines, inaccurate component batching, and poor mixing are everyday problems.

PRICING:

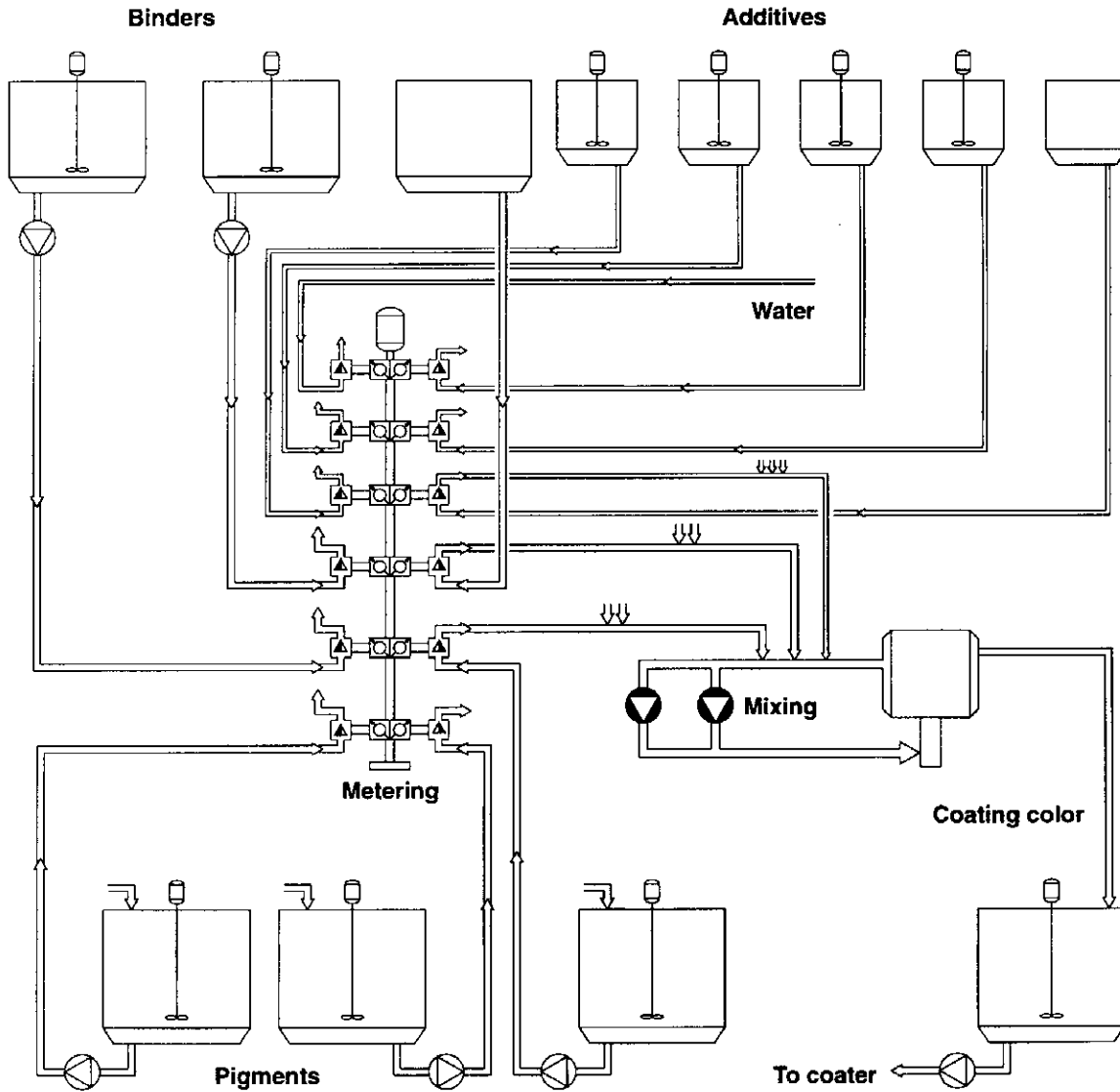
\$30,000 to \$400,000 depending on scope of supply, rate, and control standards.

COMPETITORS:

Engineering firms, in-house staff, or coater equipment manufacturers.

BRAN+LUEBBE CONTACT:

PROCESS SCHEMATIC



System Application

Tissue Additive Systems

THE TARGET GROUP?

Paper mills that manufacture tissue.

CUSTOMER CONTACT(S):

- Stock Preparation Superintendent.
- Coating Kitchen Supervisor.

WHY MIGHT THEY BE INTERESTED IN TISSUE ADDITIVE SYSTEMS?

- They want to decrease chemical usage by controlling the addition rate of various chemicals.
- They have an uneven distribution of chemicals across the tissue surface.

BRAN+LUEBBE'S SOLUTION:

- Use a metering pump to control chemical flow.
- Inject chemical into a heated carrier stream, if required, and mix for thorough dispersion.
- Provide a quick access spray bar for even distribution across the tissue surface.

WHAT ARE THE BENEFITS?

- Save money by decreasing chemical use.
- Obtain a more consistent product with less rework.
- Compact, self-contained unit for chemical metering, water heating, and delivery to the spray bar.

WHAT EQUIPMENT DOES THE CUSTOMER CURRENTLY USE?

Flow meters, control valves, and manual.

PRICING: \$10,000 to \$50,000 depending upon quantity and type of chemical.

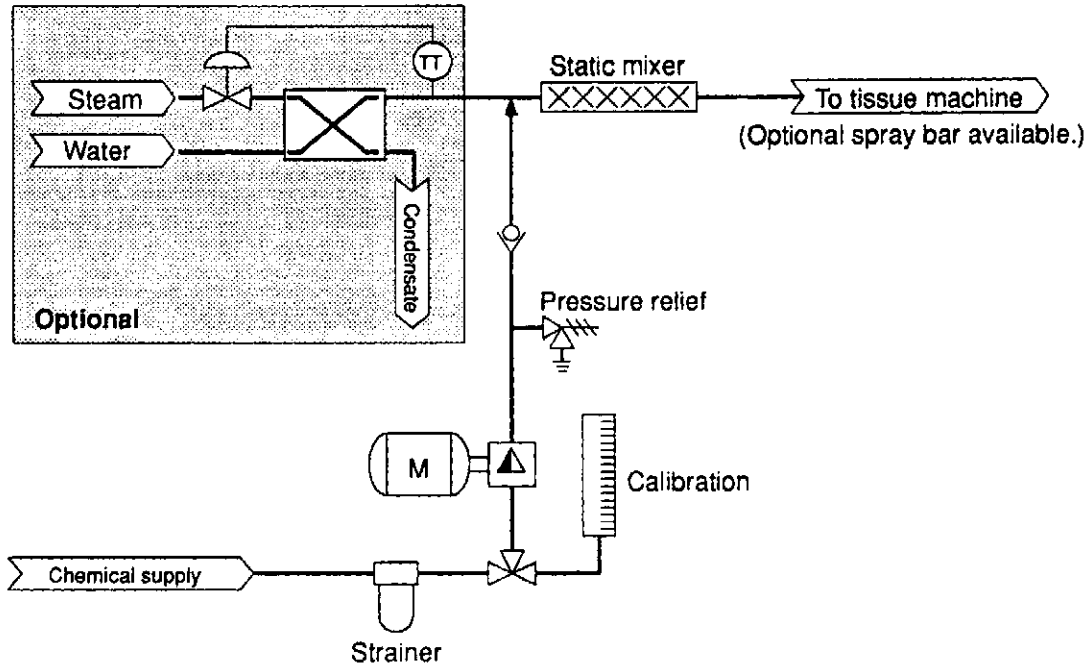
Competitors:

- In-house personnel who "put a system together".
- Engineering firms.

BRAN+LUEBBE CONTACT:

System Application

TYPICAL TISSUE ADDITIVE SYSTEM SCHEMATIC



System Application