



HEADBOXES

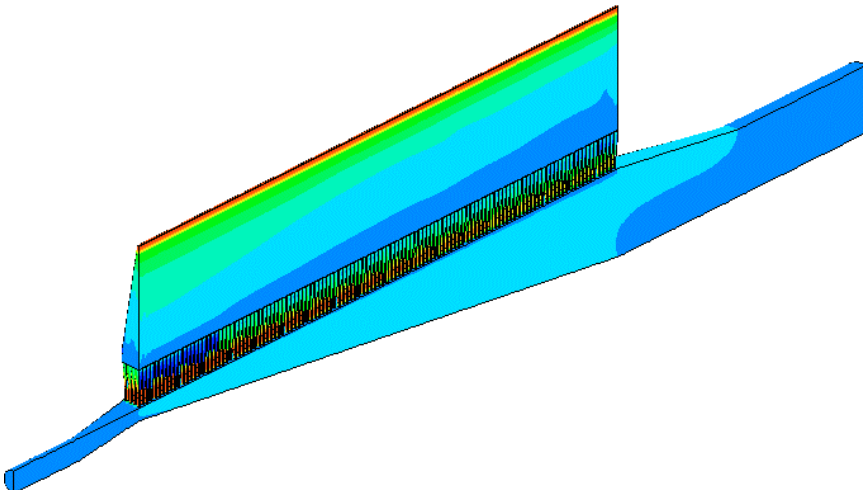
WHAT WE OFFER

PSL provides detailed analysis of headboxes that can be used to identify potential sheet-forming problems. Working with the mill, we find ways to improve headbox performance using modeling tools which predict flow and turbulence characteristics throughout the headbox. Results from the analyses are used to:

- Decrease property variations in the sheet
- Increase capacity of the headbox without adversely affecting paper quality
- Increase profit margins through improved paper quality

HEADBOX PERFORMANCE

Property variations in the paper sheet often originate in the headbox. Controlling basis weight variations in the cross-machine direction and reducing the MD/CD ratio can significantly improve profit margins.



Traditionally, headbox designs and modifications have been based on experience and simple physical modeling. Because of the complexity of the geometry and the three dimensional nature of the flow field, such an approach is often inadequate to properly identify problems and improve headbox performance. PSL simulates three dimensional flow throughout the entire headbox and predicts in advance the performance of proposed headbox modifications. Management decisions can then be supported by reviewing the best available information.

Headbox modeling provides a comprehensive picture of flow non-uniformity at the slice exit for a given paper speed range. Pressure variations inside the headbox, especially at the entrance of the diffuser block, are clearly shown.

WHAT WE CAN DO FOR YOUR HEADBOX

- Analyze the existing flow inside a headbox by performing a complete simulation of the plenum, diffuser bank, and slice
- Evaluate the effect of the approach and exit piping on the flow distribution in the headbox
- Identify the root cause of flow non-uniformities
- Analyze planned headbox retrofits
- Suggest operational and design changes to meet production goals

How Do We Do It

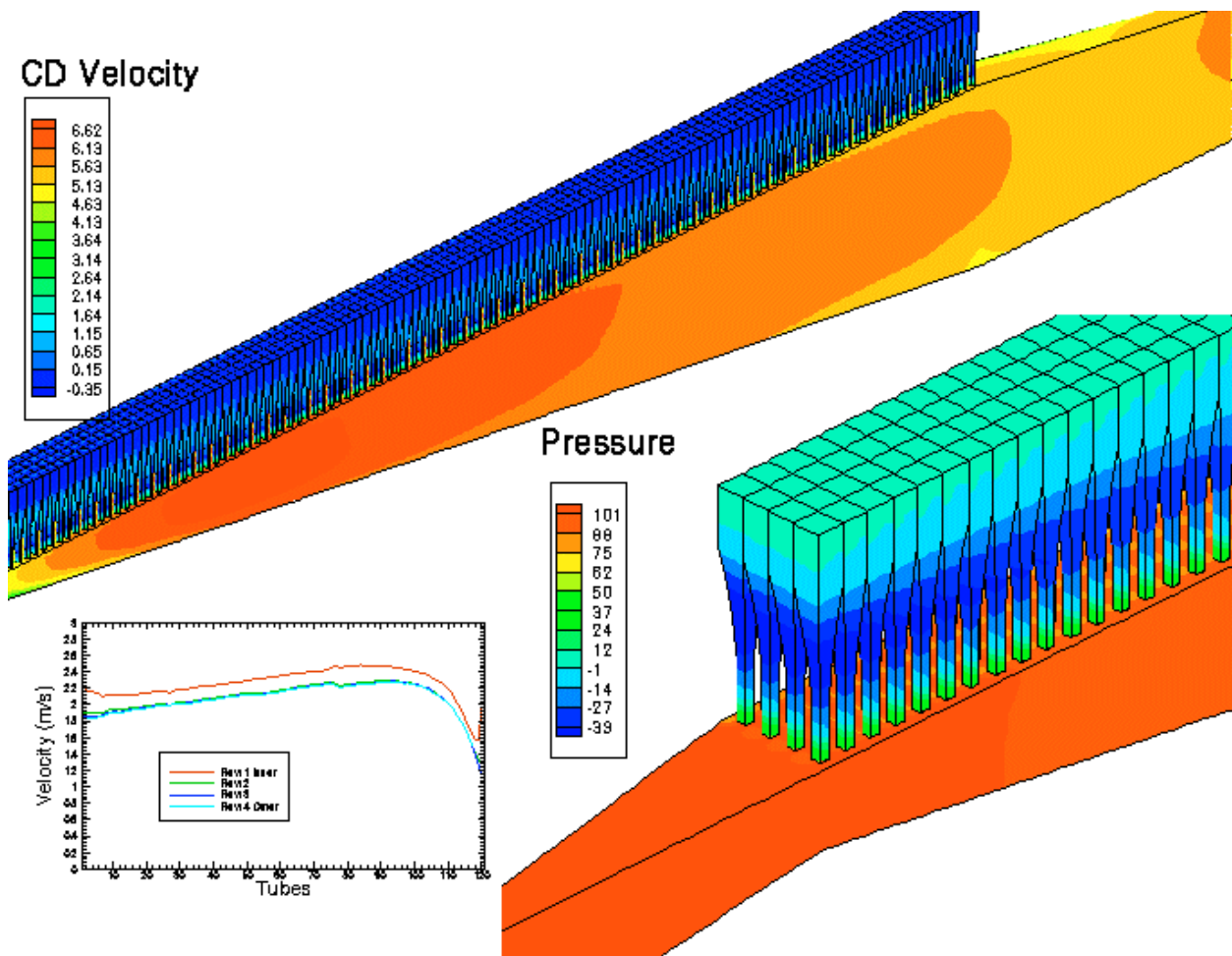
PSL works closely with the mill to collect the information necessary to build a three dimensional headbox model with parameters spanning the range of flow conditions used for production. Problems that limit production and performance are reviewed with the mill. PSL then uses its process-modeling tools to simulate the flow field and provide a physical picture of the flow phenomena inside the headbox. The results of the computer simulation are presented in the form of graphs and movies showing flow variations and turbulence characteristics inside the headbox. Injections of particles and simple fibre tracking can also be performed. The simulation results provide a comprehensive understanding of the headbox and provide a

reliable basis for optimization. Any proposed changes can be evaluated in advance using the model, so that risks in the decision-making process can be minimized.

TARGET CUSTOMERS

Our services are aimed at pulp mills who want to:

- Evaluate and compare headbox designs
- Develop more insight into the flow phenomena in headboxes
- Plan successful retrofits
- Improve paper quality and headbox performance



PROCESS SIMULATIONS LIMITED

Consulting engineers specializing in the modeling and analysis of industrial process equipment including:

- Recovery Boilers
- Headboxes
- Lime Kilns
- Hydrocyclones
- Bark Boilers
- Digesters
- Wood Kilns
- Air Ports, Nozzles, Ducts



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