

Headbox Audit Results in Significant Decrease in Web Breaks and Reduction of Softwood Fiber Ratio

Machine: 1-ply Twin Wire Dry Crepe
Grade: Tissue / Facial (10-11gsm)

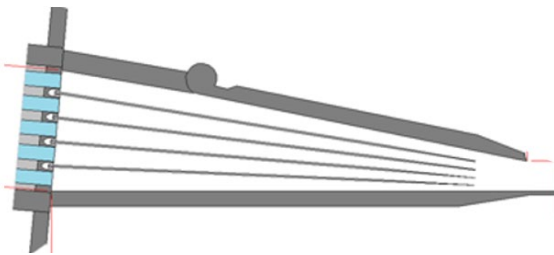
Opportunity

Customer desired to reduce sheet breaks and reduce softwood fiber ratio due to increased fiber costs.

BTG's Approach

After reviewing what had been done to date with minimal success, BTG recommended conducting a headbox energy (NRGx) audit. A headbox that does not have its energy properly balanced can result in poor formation, pinholes and high variability in the finished product.

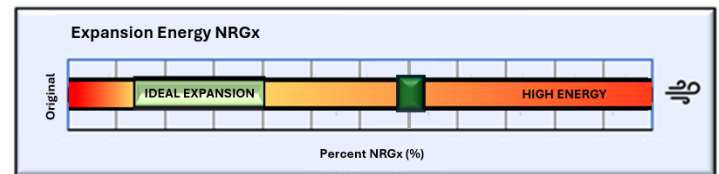
The BTG engineer collected the necessary information about the mill's process and current headbox sheet arrangement and set-up. The figure below shows the original set-up.



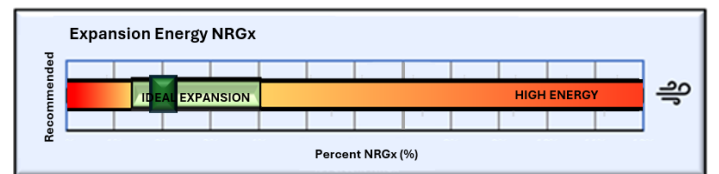
Analysis of the data revealed that the headbox energy was too high for the grades being produced. When the expansion energy generated in the headbox nozzle is too high, the fibers are more likely to spin and flock together, resulting in a more poorly formed sheet with larger void space in the structure. The mill was compensating for this lower tensile strength by increasing the softwood ratio, increasing their furnish cost.

BTG's Recommended Solution

The graph below shows how the expansion rate of the original arrangement compares to the "ideal" range generally seen on similar tissue machines. The original design was generating a very high expansion energy, which can have a substantial negative impact on formation and specifically on pinhole generation.



The mill settled on an arrangement which generated an expansion energy more suitable for their process. This arrangement helped to form a more uniform sheet with fewer voids, resulting in an 80% reduction in sheet breaks. Additionally, the formation improvement yielded a stronger sheet which allowed the mill to reduce the softwood ratio by 3% to maintain target tensile strength.



Financial Benefit

The change in headbox sheet design generated a significant reduction in sheet breaks (80%) and softwood fiber usage resulting in savings in excess of 400,000 EUR/year.

If you would like to verify if your headbox sheet arrangement is optimum for your process, please feel free to contact your local BTG account manager or NRGx@BTG.com