

Significant energy savings with Kurita PJ Technology

Application at the dryer section in a paper mill



1. Keywords

Paper mill, paper dryer section, multi-cylinder, Yankee, KURITA PJ, energy saving, increase of production, reduction of steam consumption, corrosion inhibition

2. Background

The dryer section in paper mills is by far the largest energy consumer in the paper industry. A Japanese paper producer needed to decrease the speed of the paper machine during winter time with direct negative impact on the total paper production capacity. In the course of the cold season, when the surrounding temperature is low, it is needed more steam and therefore more energy to remove the moisture from the produced paper via the dryer section.

This case study illustrates how KURITA PJ Technology solved the customer's problems and led to high economic benefits throughout the whole year.

3. System description

In the paper dryer section, rotating cylinders are heated by steam to remove the moisture. The dryer unit is by far the largest energy consumer in the paper plant and it constitutes almost 40% of total capital cost.

In paper drying, heat transfer occurs at the interface between steam and condensate in the cylinder and between paper and air outside the cylinder.

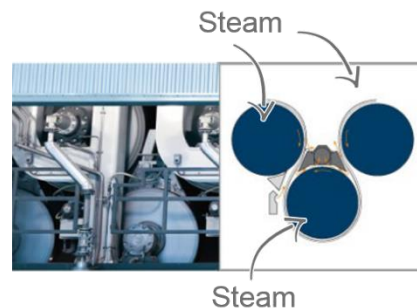
4. Objectives

- Reduce energy consumption
- Increase the speed of the paper machine
- Reduce steam pressure
- Improve corrosion inhibition

5. Action/Approach

Kurita offered KURITA PJ Technology, an innovative and practical solution for the paper dryer section. Kurita's approach improves the heat transfer efficiency and meets customer's needs for energy savings and increased paper production capacity, especially during winter time.

The injection of Kurita PJ Technology into the steam (see scheme below) establishes a hydrophobic layer on the dryer cylinder surfaces. This leads to clean surfaces and an improved condensing behavior of the steam inside the cylinder. The result is a significant better heat transfer directly leading to energy savings and increased paper production capacity.

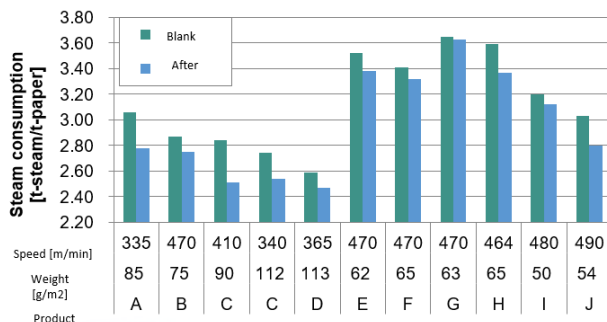


6. Achievements

- Steam consumption decreased 5% to 10%
- Savings of 240\$/day (26,000 JPY) was achieved (Calculated based on steam amount of 280 t per day and a steam price of \$15 (1,600 JPY) per ton of steam.

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- No requirement to decrease the paper machine speed during winter time (usually between 5 and 10 m/min.)
- Based on the customer's calculations this generates additional profit of \$23,100 (2,500,000 JPY) per month (based on 24 production days per month).
- Reduction of steam pressure about 10%
- 5% production increase
- Corrosion inhibition improvement and bulging prevention due to drying; etc.



Decrease of steam consumption
(After 3 months treatment)

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