



# KapStone Container Corp.



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## Organization Background

KapStone Container Corporation is a manufacturer of corrugated packaging products in Fridley, MN. The plant makes a variety of cardboard from paper stock and converts it to boxes designed, sized, and printed to customer specifications. The plant has served the upper Midwest market since 1962, and ships to over 30 states, Canada, and Mexico. The corporation is currently in the process of being purchased by Westrock.



*“Working at MnTAP gave me the opportunity to gain hands-on experience in an industrial setting. The project was challenging, but the guidance and support from MnTAP and Kapstone staff helped me understand its complexity and develop solutions to the problems. In addition to the fundamental engineering skills I got from this experience, the valuable feedback contributed tremendously to my personal growth and development.” ~ NT*

## Project Background

Large volumes of water are used for cooling in corrugated cardboard production and for cleaning related to printing operations. Large amounts of paper waste is generated from equipment, operational problems, changes in paper properties, as well as unavoidable trim. This project attempted to identify specific causes for some of the waste and then identify solutions.

## Incentives To Change

KapStone Container has the third highest water consumption in the city of Fridley, consuming 10 million gallons of water in 2017 at a cost of \$100,000 per year. The plant also generates about 9 million pounds of paper waste per year, and has a goal to reduce manufacturing paper waste from 14.5% to 12.5% of the total amount of paper purchased. Paper waste currently costs about \$2,700,000 per year.



# Solutions

Six water reduction options were evaluated. One has been implemented, three are recommended, and one needs more investigation. Paper waste investigations clarified material handling root causes, and identified one option which needs more investigation.

## Repair Leaking Valves

Leaky water valves were identified and repaired on the Bobst 200, a converting machine which cuts, folds and prints corrugated sheets. This saves approximately 250,000 gpy and \$1,800 per year.

## Implement Flow Reduction with Pressure Regulator and Flowmeter (70° closed)

Reducing water flow by manual valve adjustment through the Paser water jackets by 2.7 million gallons per year should not raise the starch temperature in the tray. Further water reduction may be possible with additional valve adjustment, or may be almost entirely eliminated by adding a chiller to close the water cooling loop saving 4.6 million gpy.

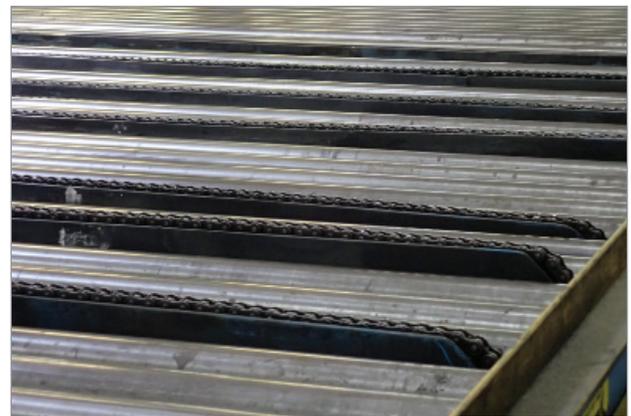
## Modify Cleaning Procedure in Bobst 200

A modified cleaning procedure for the Bobst 200 to shorten the cleaning step while making sure all ink coated surfaces are washed should reduce water by 520,000 gpy. Preventing water buckets from overflowing on the Bobst 200 should reduce water use by another 500,000 gpy.

The water reduction potential of these three recommendations is 3.7 million gallons per year, with corresponding savings of \$37,000, and requiring about \$1,300 to make the changes.

## Adjustment of Sewer Bill

The current sewer bill is based on water purchases and does not account that water used for starch formulation is not sewer. If an acceptable method of accounting for starch water is worked out with the City, the sewer portion of the water bill could be reduced by \$1,700 per year.



Recommendation	Annual Reduction	Annual Savings	Status
Repair leaking valves	250,000 gallons	\$1,800	Implemented
Flow reduction with implementation of pressure regulator and flowmeter to Paser waterjackets (Option A)	2.7 million gallons	\$24,000	Recommended
Add chiller and closed loop cooling to the Paser water jackets (Option B)	4.6 million gallons	\$37,000	Recommended
Modified cleaning procedure in Bobst 200	520,000 gallons	\$4,500	Recommended
Implementation of solenoid valve and float switch in Bobst 200 for bucket filling	500,000 gallons	\$5,300	Recommended
Adjustment of sewer bill	N/A	\$1,700	Discussion with city
Rotational control on the clamp truck	N/A	N/A	Needs further investigation

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