

## Intern reduces printing waste at Advanced Web

After consulting with a MnTAP intern, Advanced Web improved their method of printing excess labels and color-matching. These changes are resulting in significant waste reductions and cost savings for the company.

### Company Description

Advanced Web is a flexographic printing company in Northeast Minneapolis that resulted from the 2005 merger of Advanced Web Technologies and Web Label. They produce labels, magnets, stickers, and a variety of flexible printed products for medical device companies and other original equipment manufacturers.

### Project Description

Advanced Web uses flexographic printing to produce printed labels. Flexographic printing uses a printing press and roll-to-roll contact printing to apply ink. Producing a high quality label requires precise ink color matching and layer-to-layer alignment. During printing, operators can flag errors which are later removed by rewinders. Most of the waste generated at Advanced Web occurs during the setup of the press while the strict color and alignment specifications are dialed-in.

### Incentives for Change

Solid waste at Advanced Web totaled over 50,000 lbs per year, and waste expenses were around \$1.2 million per year. Therefore, any waste reduction would translate to a direct improvement in the bottom line.

### Areas for Improvement

The MnTAP intern began by collecting waste generation data. This was accomplished by observing and quantifying the waste generated at each step of the process. About 50% of the waste was determined to come from two sources. The



The MnTAP intern helped develop methods to significantly reduce the amount of excess printing material being wasted.

majority of Advanced Web's waste was from extra material, called "overs." Overs are printed to make sure there are enough labels to ship after any defective labels have been removed. The next greatest source of waste was manufacturing labels that did not meet specification due to improper color matching of inks.

### Overs

Customer orders specify the minimum and maximum number of labels that will be accepted in a shipment. Invariably there are defective labels produced in the flexographic printing process, so operators run extra labels to ensure that there are enough labels to fill the order after the defective labels have been removed. However, the process for determining how many extra labels, called "overs," should be run was determined mostly by experience and was inconsistent between press operators. The overs accounted for 38% of the waste generated at Advanced Web, or \$39,000 per

### Benefits Overview

Waste Reduction Option	Waste Reduced	Annual Cost Savings
Standardized production of overs based on project size and difficulty	12,000 lbs/yr	\$144,000
Improved color-matching using spectrophotometer	3,800 lbs/yr	\$44,000

month. To reduce this waste, Advanced Web wanted to develop a more consistent method for determining how many overs to schedule for each job. The MnTAP intern developed a system for classifying the degree of difficulty of a job based on the number of inks required, the width of the label, and the complexity of the label. The intern then collected waste generation per job based on degree of difficulty and used the data to develop a statistical model of expected defects per job. After much model adjustment and data collection, a table was generated from the statistical model that the operators can use to determine how many overs to produce. Advanced Web has implemented this table as standard practice and is now evaluating the impact. The savings achieved by standardizing the overs production is approximately 12,000 lbs/yr solid waste reduction and comes with a \$144,000 per year projected cost savings.

### **Color Matching**

The MnTAP intern also determined that 12% of Advanced Web's waste was due to improper ink color matching. Color matching is done by trial and error at Advanced Web, and there is variability in the skill of operators at matching the colors quickly. The longer it takes to get proper color match, the more labels end up being wasted. One way of reducing the trial and error component of color matching is to use a piece of equipment called a spectrophotometer. A spectrophotometer uses photosensors to determine the amount of light in the specific color band absorbed by the sample. The results are quantitative, and the machine is able to tell the operator exactly how much ink must be added to hit a target output color. The spectrophotometer had a purchase cost of \$15,000, providing a 4-month payback. By using the new instrument the company saves 3800 lbs of waste per year and \$44,000 in rework costs.

### **Improved Setup and Maintenance**

By going through the process of quantifying the sources and magnitudes of the wastes at Advanced Web, the intern was able to make recommendations about improved setup and maintenance practices that would save waste and money. First, by setting up the presses at a lower speed, adjustments produce fewer defective labels. An estimated 1,440 lbs of scrap, or about \$18,000 annually, was saved by slowing the press during the registration sequence. Second, some defective labels were being produced simply because ink was running dry on certain parts of the press. Using an ink pump, rather than relying on a manual fill process, can significantly reduce the occurrence of static or missing print. Advanced Web purchased and installed ink pumps for all locations where they were missing as a result of this project, saving an estimated 720 lbs of waste per year. Finally, part of the press called the impression gear was routinely causing defective labels. The impression gears are easily damaged by handling, but they were not being replaced as often as they could. By running with a damaged gear, 2,880 lbs of waste and \$36,000 per year was being wasted. By changing the gears more frequently, the waste was reduced by 50%, saving 1440 lbs of waste and \$18,000 per year.

### **Results and Benefits**

As a result of this MnTAP intern project, Advanced Web was able to reduce their solid waste generation by over 17,000 lbs per year and has saved over \$200,000 per year.

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### **For More Information**

MnTAP has a variety of technical assistance services available to help Minnesota businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution, increase energy efficiency, and reduce costs. Our information resources are available online at <[mntap.umn.edu](http://mntap.umn.edu)>. Please call MnTAP at 612.624.1300 or 800.247.0015 for personal assistance or more information about MnTAP's Intern Program.