Case Study: Manufacturer Gets Huge ROI from Cutting Optimization

The Company:

Diversified Machine Inc. (DMI), 430 North Franklin Street, Lancaster, PA 17602, USA. DMI was founded in 2001 as a manufacturer of sprint race components for motorsports. It produces more than 30 categories of products, including their famous GoldStar front hub and BullDog rear ends. The company's 27 employees and 12 CNC machines are housed in a 66,000 sq. ft. building. DMI employs the latest technology with software like Auto Cad Inventor, Auto Cad, and Mastercam X5..

The Challenge:

During the first stage of manufacturing, DMI cuts aluminum, steel, and titanium linear stocks according to project specifications. Because stocks come in standard lengths from the suppliers, finding a way to cut them without being wasteful had always been a challenge for the saw operators. They prepared for their cuts all manually with a pencil, a piece of paper and a calculator. Oftentimes, the process required 40 to 70 minutes, depending on the project complexity. The results usually involved very long drops (12 inches and longer) that were not useful for anything other than scrap.

"Over the past few years we have been wasting so much material, time and money," said Jennifer Ely of DMI. "We wanted to improve our efficiencies and reduce our operation expenses and the environmental impact of our processes, and in doing so, we wanted to get a competitive advantage in current economic conditions."

The Solution:

To facilitate its strategy, DMI decided to try out one of the existing software solutions on the market to automate the company's cutting plan generation. After some online research coupled with DMI's familiarity with Microsoft Excel, the staff chose cutting optimization add-in 1DCutX from Optimalon Software Ltd.

The integration process of Microsoft Excel and 1DCutX took about 10 minutes to download and install on Ely's computer. The learning took another three minutes— the tutorial video on YouTube demonstrates how to work with the software in a simple and intuitive manner.

When engineers finish their work on a new project, they provide a computer operator with an Excel spreadsheet that lists the lengths, quantities, diameters and material types of all required parts. A computer operator links this spreadsheet to the company's inventory spreadsheet using the 1DCutX graphical user interface. In addition, the computer operator specifies required cutting parameters (saw kerf, minimal cut-off size, etc.) and runs the calculation from the GUI.

1DCutX generates the graphical cutting plans on separate spreadsheets, and the computer operator prints them and delivers the copies to the saw operators. The cutting optimization software also creates a summary report that shows how many stocks are required for the project, and an inventory spreadsheet gets updated accordingly. Based on the spreadsheet changes, the inventory department gets notified when inventory gets low or if different stock sizes are need so they may easily order more stocks from the suppliers.

The Results:

Now that the saw operators have been relieved from the cutting planning process, their workplace stress has decreased and their productivity has increased. In fact, they were able to gain 40 to 70 minutes in production time now that they no longer have to plan their cutting the old-fashioned way.

Every cutting project has now been saved as an Excel spreadsheet file in the company's fileserver. This allows computer operators to easily retrieve the cutting diagrams when the same project comes again. This diagram storage method is more convenient and organized.

However, the biggest benefit came from the material savings. Implementing 1DCutX reduced the material waste to less than 1 inch. The cost of 1DCutX is $69. Monthly savings in materials alone range from $200 to $1500, which means the software pays for itself in less than a month.

After working with 1DCutX since December 2010, Jennifer had this to say about the program: "I don't know what we would do without it. The program is so easy to use, and the cut length diagrams are very easy to understand. 1DCutX is an essential component of our daily manufacturing processes."