



WHITEPAPER

Automating and Optimizing the Cutting Process- Discovering New Capabilities with Dynamic Nesting

Plataine's manufacturing optimization solution helps furniture manufacturers dramatically reduce manufacturing costs, save material and increase overall profitability.

[WoodOptimizer](#) automatically handles work orders, optimally creating cut paths for them according to preset machine configurations and creating a G-Code with minimal human interaction. WoodOptimizer has an option to receive work order information directly from ERP systems, nest those work orders dynamically, and create cut files (G-Codes) suited for the CNC machines they will be cut on. All of this is done automatically, without any manual interference.

Let us understand exactly how this works, step by step.

CNC Machines & Materials Configuration

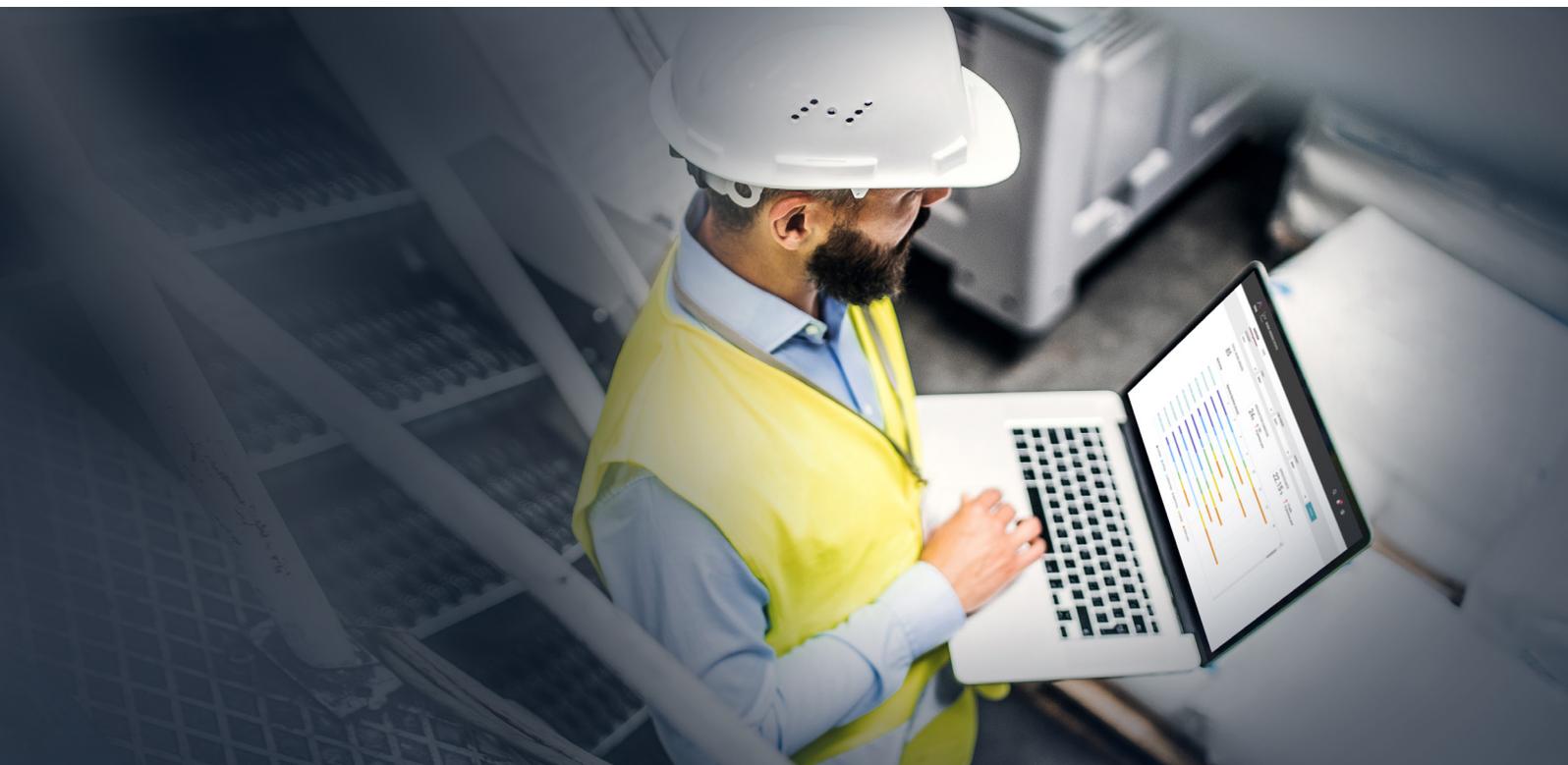
When a new customer starts working with WoodOptimizer, Plataine's Professional Services Team communicates with him and configures the application according to the machines, tools, and materials the customer uses daily.

In this one process, profiles are created for each machine so that in the future, every nest & cut file that will be cut on any of them will have the correct setting without any need for manual manipulation.

The customer does not need to change anything in his manufacturing process, except for the fact that he now has access to a new tool in his workshop: WoodOptimizer.

The customer can create his own profiles for the machines he uses most often or use the ones that are created by Plataine's Professional Services Team. In addition to configuring WoodOptimizer, our experts also provide training on how to use it and help customers understand its functions.

The configuration is done in several steps, which allows the customer's staff and WoodOptimizer's Professional Services Team to work together. In this way, both teams learn about each other's needs and expectations so that the process does not end when the software is installed but continues for years.



Kits Import

The next step is to load the kits (or models) to WoodOptimizer – this is not mandatory, as the user can also run the kits directly from their paths instead of importing them to the application. However, by importing the kits to WoodOptimizer, the user can see the import time and visually check the parts of the kit to make sure it is the latest revision and that it looks valid.

In any case, each element of each part of the kit can be marked that WoodOptimizer knows to assign to the specific tool that will cut it later (for example, if a part has some elements that should be cut by a drill and others by a router, they will be assigned to their proper tools when loaded to WoodOptimizer).

It is worth noting that WoodOptimizer has an automatic parts identification mechanism that works with SolidWorks. This mechanism can identify types of elements to WoodOptimizer and match them to their respective tools upon import. Kits, at this stage, are also assigned to their relevant materials. This is done easily by using text on the pieces to provide the material allocation for each one. For example, if a user has a kit with 3 pieces, each one with the following text element: "9MM", "12MM," and "15MM", WoodOptimizer can be set to allocate each piece to a material with the same name, as it was set in the configuration. This is done without any manual manipulation.

Loading Work Orders Daily

So now that we have the machines, tools, materials, and kits all set up, all remain to nest the work orders. The work orders list is exported from the user's ERP system daily. This list can also be merged with an additional BOM (bill of material) file, which contains permanent information regarding each kit (for example, specific restrictions such as gaps or rotations) – again, all of this is done fully automatically.

Any additional information the user wishes to add to the work orders can also be loaded to WoodOptimizer so that later this information can be displayed in reports created by the application.

WoodOptimizer's automatic mechanism is set to fetch the information, load them, and immediately nest all the work orders listed. The work order information contains the relevant kits and quantities that are required, and since the rest of the information already exists in the system (materials, machines, etc.), the nesting – followed by the cut path creation – starts immediately.

The work order automatically nests the kits in different materials, and the cut paths are created in proper order for the relevant tools as needed (for example, drilling is done first, the router cutting – last). It is important to note that the holding method of the table for each machine – which is set during the configuration stage – affects both the nesting and the cut path creation to ensure that the result is as optimized and stable as possible during the cutting stage.

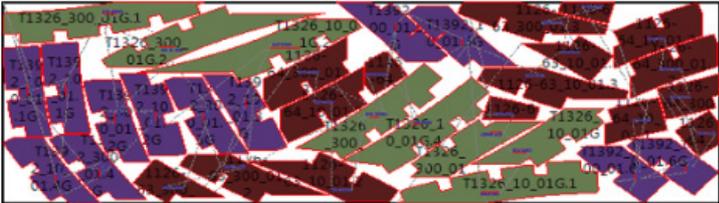
Results, G-Codes & NC Files Creation

The nesting results are shown in WoodOptimizer visually, clearly, and conveniently, providing the user animations of the cutting process for his convenience. Each cut row provides the user information such as the nesting efficiency, length of the sheet used, the cut's material, the nested parts, etc.

Default approach: producing each job separately requires 160.99" of material

Part #	#100	#200	#300
Tool ID	Tool-1000	Tool-2000	Tool-3000
Total length: 160.99 (in.)			
Length:	58.149 (in.)	52.0365 (in.)	50.8123 (in.)

Optimized Approach: combining all 3 jobs yields 19.47% material savings, reduces labor



Total Material used for all 3 jobs combined: 129.65"

#100 #200 #300

This data can also be exported and printed in reports (including visual simulations of the cuts). The G-Codes & NC files themselves are exported automatically to preset folders – each for a specific machine – so at this stage, all the machine operator really needs to load the relevant NC file to the machine and let it start the cutting process. Notice that from the moment the ERP system exported the work orders list to when the G-Codes were created, the user did not require a single manual action. Once the cutting process is done, WoodOptimizer will wait for the next work orders list to process to trigger the automatic nesting and cut paths creation.

Advantages of WoodOptimizer

Following are some advantages of WoodOptimizer that you can leverage.

- **Improves Productivity**

WoodOptimizer increases productivity significantly and reduces material and labor waste. With Plataine solution, you can produce higher quality products to meet your customer's expectations and improve their satisfaction. With automated Plataine's solution, you will increase your revenue and reduce costs at the same time, since you'll be able to produce more parts and much faster, thus improving your productivity.

- **Saves Time and Money**

WoodOptimizer saves time and money on buying a new optimizing machine. This is the best option for those who want to save money and get the same results as a new machine. Keep your existing wood-optimizing machines with their original software but upgrade them with this wood cutting optimization program. You will be able to produce higher quality products to meet your customer's expectations and improve their satisfaction.

- **Easy to Use Interface**

No need to learn complex optimizing software; WoodOptimizer has an easy-to-use front end. You can optimize your machines with just a few clicks of the mouse. It is very easy to use, even if you have never optimized your wood-optimizing machine. The software gives you complete control over all processes and allows you to change parameters such as feed rate, pressure, and speed.

- **There is No Need for CAD Layouts or Designs**

No need to train your employees on how to design layouts in CAD or any other application. WoodOptimizer uses its own CAD system, allowing you to optimize your machine without prior knowledge of CAD or 3D models. You can use this software to create a layout in just a few minutes and get instant results! The software is easy to use and gives you complete control over all processes. So, you don't need to design your wood-optimizing machine manually or in CAD. You can just use the software to generate optimized layouts for you. The software automatically takes care of all processes, including finding the best feed rate, pressure, and speed for each process. It also allows you to change these values according to your requirement easily.

- **Unlimited Nesting Configurations**

WoodOptimizer supports unlimited nesting configurations based on sheet, part constraints, and material types definitions. This helps you optimize your entire process, from cutting a sheet of plywood to the final product. It also supports nesting configurations based on cutting data. You can add new nesting configurations in the software and remove them if needed. The software allows you to manage your nest layouts easily. You can define the nesting configuration based on sheet size and material type so that you can use it to optimize parts of different sizes. It also supports multiple part nesting configurations in a single run, which means you can optimize all parts simultaneously instead of running the process separately for each part.

- **Automatically Calculates the Possible Cutting Plan**

WoodOptimizer is a cutting optimization software that automatically calculates the best possible cutting plan that saves you more than 40% of the material cost, depending on your type of business and market prices. This cutting optimization software uses advanced algorithms to calculate the possible cutting plan, which helps you save your material cost. The software also offers a wide range of customization options that help you find the right solution for your business. You can also modify the cutting plan manually to optimize the use of material and reduce waste. This feature helps you manage your materials efficiently and save time by providing accurate cutting plans for all parts in one run.

- **Optimized DXF Files for CNC**

The wood cutting optimization program, WoodOptimizer, generates optimized DXF files for popular CNC machines or plotters so you can optimize for one or more machines simultaneously. You no longer need to cut the same thing twice for different types of CNC machines. The software also allows you to customize the parameters for each CNC machine and material type, ensuring that every cut is optimized for the right machine. This feature helps you save time by reducing the amount of manual work required to generate cutting plans. Besides, the automatic wood cutting optimizer and plan generator offer a wide range of customization options that help you find the right solution for your business.



