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people-smart automation

Breaking Down the Barriers of Nesting Efficiency in Upholstery Fabric Cutting

The Business Challenge

Nesting software differ from one another by their ability to nest complex shapes in the most efficient and practical way. However, with the advancement of nesting research, the Nesting product category has reached a glass ceiling of efficiency and the various competing products differentiate each other on fractions of yield improvement.

However good or poor these nesting software are, they are all limited by design to nesting a given quantity of product on predefined material of specific length and width. Thus, Nesting software cannot and do not consider other relevant factors driven by the manufacturing reality, such as remnants available in the warehouse, material's batch information and other incoming orders.

Breaking through this glass ceiling of nesting efficiency requires a new approach: a transition **from a 'point solution' to an 'enterprise level' solution**, which is able to generate comprehensive production plans **on the fly while considering all relevant information at once**, including: customer orders and requirements, material availability, machine capability and availability and of course - product design.

A Production Optimization Software that practices such a holistic approach leverages dynamic and creative optimization techniques to address production inefficiencies to generate a new level of savings.

Problem Solved

The following examples will discuss some of these techniques;

Remnant Utilization

Scenario	% Material Saving	Marker Preview	
Remnant Utilization	2.7% + 1.65y Utilized Remnant	Current Practice 5.24y	vs. TPO + TPO 3.45y+1.65y=5.10y

Using traditional Nesting software, a set that requires 5.24 yards of material to cut, will always be nested on a roll that is at least 5.24 yards long. In such cases, any shorter rolls left in stock will not be used, pile up and eventually be discarded. Taking a broader approach that considers actual stock and that is able to nest a single kit over multiple rolls, allows utilizing the short rolls in stock. In the example below, the broader approach not only directly saved 2.7% of material, but also indirectly 'saved' remnants waste.

Multi-Order Nesting

Often, two orders requiring the same material are cut from two different rolls simply due to lack of communication between the orders platform and the cutting platform.

Production Optimization Software seamlessly integrates with the CAD and ERP systems and enables two orders to be mixed on the same nest to result in 5.7% material savings in addition to the reduced labor and set-up time driven by the usage of a single roll.

Scenario	% Material Saving	Marker Preview
Order mixing (Quantity = 2)	5.7%	2x Current Practice 2x5.24y=10.48y vs. TPO 9.88y

In the example above, both orders are combined into a single nest. However, where production policies prevent this practice due to mixing constraints, the two orders could be placed 'back-to-back', still allowing material savings of 4.4% and maintaining the labor efficiencies of pulling the roll once from stock, loading and cutting it once.

Scenario	% Material Saving	Marker Preview
Combine multiple orders Back-to-Back on the same roll	4.4% + Reduced set-up time & increased roll shelf life	TPO 2x5.01y

Summary

While nesting software has reached a limit with the material savings it can offer, Production Optimization Software generates production plans dynamically while practicing a holistic approach integrated with all business units in the factory and thus reach new levels of efficiency.

Production Optimization software approach the production process as a whole resulting with:

- Increased material utilization and better remnant management
- An automated, more efficient process
- Reduced errors and improved quality
- Faster time to market

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