Fraunhofer SCAI

AutoPanelSizer – optimized cutting layouts for panel-sizing saws

The AutoPanelSizer software determines optimized cutting layouts for the production of rectangular parts from rectangular raw material, thus minimizing waste, production times, and manufacturing costs. AutoPanelSizer generates cutting layouts that can be produced by straight, continuous guillotine cuts. This makes the software suitable for common cutting technologies applied in wood machining and the glass, metal, and plastics processing industries.

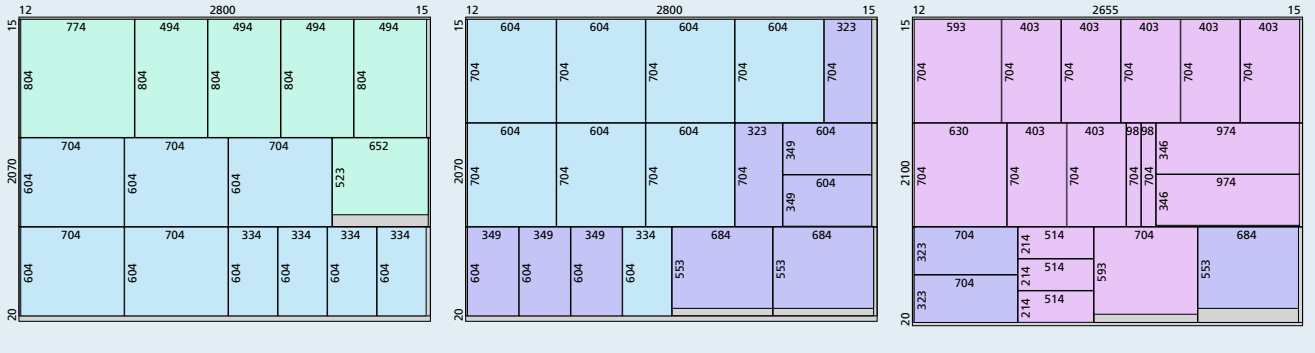
Cutting layouts in seconds

AutoPanelSizer can compute layouts with up to three cutting stages plus head cuts and considers different constraints imposed by the cutting process and the material. Available remnants and various sizes of raw sheets can be included in the optimization. The computation of a typically sized cutting layout takes only a few seconds to a couple of minutes and can be further reduced using multiple processor cores.

Reduced production costs – increased yield

AutoPanelSizer considers production times and manufacturing costs and weighs time-consuming operations, such as head cuts, recuts, destacking, or remnant storage, against a more efficient material utilization. Production time is reduced by sawing several sheets at the same time in a package cut. Tensions in the material can lead to bent cut edges. To prevent this, AutoPanelSizer can insert stress release cuts for better cut quality.

Destacking restrictions of finished cut parts can be taken into account via part groups, as can requested production sequences, even across multiple materials. AutoPanelSizer supports a maximum allowed overproduction that can be set per part: a few additional parts may be placed on the cutting layout to improve the yield.



1) Section of a cutting layout with three cutting stages. It has been taken into account that only 2 destacking stations are available. Parts with the same color must be destacked together.

Integration into existing software

AutoPanelSizer is distributed as a pure geometric optimization engine without a user interface and is designed for integration into other applications via an XML interface, such as plant control systems, MES, or ERP systems. The software runs on Microsoft Windows.

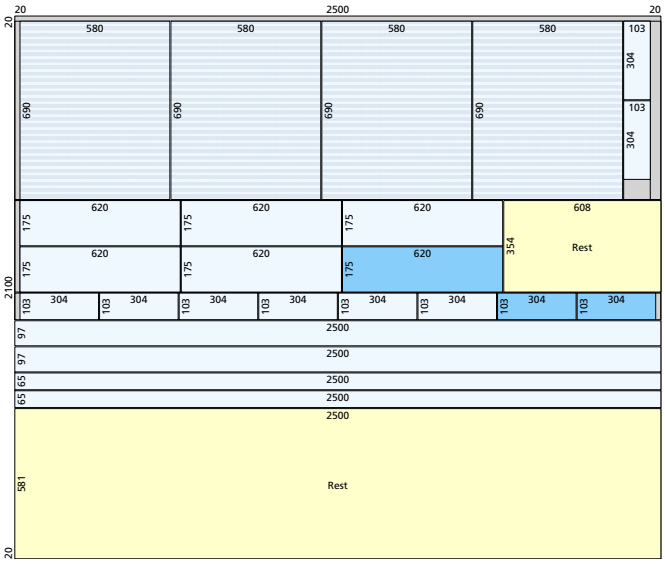
AutoPanelSizer is aimed at

- software solution providers who want to integrate an optimization into their application, and
- larger companies willing to program a connection to their IT systems or have it programmed.

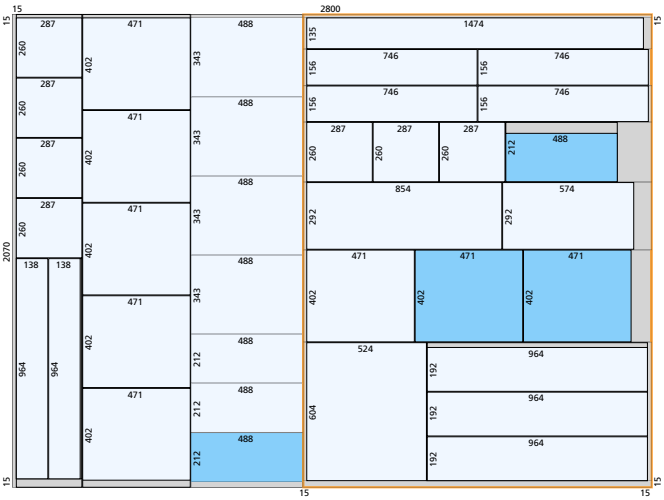
Fraunhofer SCAI constantly improves and enhances AutoPanelSizer based on the latest research results. AutoPanelSizer benefits from the institute's long-standing and broad algorithmic expertise on optimization.

Selected Features

- Consideration of production times and manufacturing costs
  - Evaluating potential package cuts, head cuts and recuts with respect to yield
- Minimum and maximum lengths of cuts and saw feeds
  - for strips, parts, identical strips and end sections
  - for mapping restrictions caused by machine widths, transport devices, grippers, etc.
- Setting the feed direction
- Individual trimming at the panel edges
- Required and optional demand
- Grain of sheets and parts
- Remnants
  - Minimum and maximum size
  - Weighing against yield and optional parts
  - Preferred use of existing remnants
- Head cuts
- Recuts
- Stress release cuts
- Package cuts
- Optimization across multiple material types
- Part groups (also cross-material) to model destacking restrictions
- Adjustable runtime and optimization quality



2) Cutting layout with reusable remnants: AutoPanelSizer balances between the production of optional parts (dark blue) and remnants. Striped parts may not be turned because of the grain. Overlength parts are not trimmed.



3) Cutting layout with head cut: The layout is divided into the "head plan" (on the left) and the "main plan" (outlined in orange).

Contact

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AUTO PANEL SIZER

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