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 and minimizes waste, production times, and manufacturing costs. AutoPanelSizer generates layouts that can be produced with straight, continuous (guillotine) cuts. In the case of interlinked plants, the maximum number of cutting stages is taken into account. This makes the software suitable for common cutting technologies applied in the machining of wood and also in the glass, metal and plastics processing industries.

Cutting layouts in seconds

AutoPanelSizer can compute layouts with up to three cutting stages (or two stages plus recuts) and head cuts (see picture 3), all while respecting requirements imposed by machine and material properties.

Available remnants and various sizes of raw sheets can be included in the optimization. The computation of a typical cutting layout takes from only a few seconds to just a few minutes. When using multiple processor cores, the runtime can be further reduced.

Reduced production costs – increased yield

In the optimization process, the software considers both production times and manufacturing costs. It can weigh time-consuming processes, such as head cuts or the storage of remnants, against a more efficient material utilization. By combining identical cutting plans into packages, simultaneous cuts are feasible, thereby reducing production time.

AutoPanelSizer can insert stress release cuts that take the tension out of the material for better cut quality. Furthermore, each part to be produced may be assigned to a part group. This allows both destacking restrictions and production sequences to be taken into account. In connection with part groups, the optimization can also be carried out across different material types.
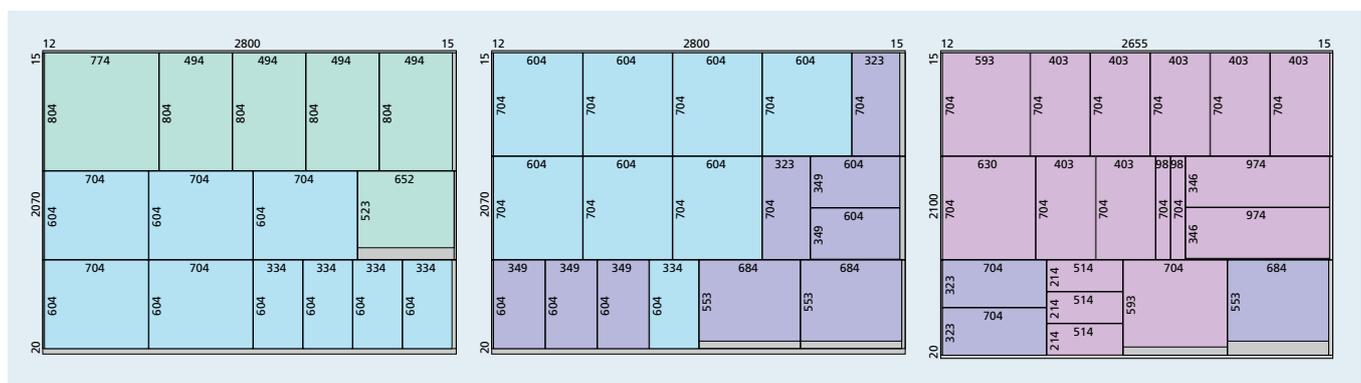
1) Section of a cutting layout with three cutting stages. It has been taken into account that only 2 destacking stations are available. Parts with the same color must be destacked together.

Anticipatory planning by optional overproduction

In AutoPanelSizer, parts may be declared as required (compulsory) or optional. The former have to be placed on the cutting layouts, the latter are only placed if they fit well and improve the yield. For example, parts that are needed the next day can be declared as required, while parts that are needed later can be declared as optional. This anticipatory production improves the efficiency of the cutting layouts and reduces the overall material consumption.

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

Integration into existing software

AutoPanelSizer is distributed as a pure geometric optimization engine and can easily be integrated into other applications, such as plant control systems, MES, or ERP systems. For this purpose, AutoPanelSizer has an XML interface that can be used via standard input/output, files, or network service. The software runs on all current Microsoft Windows operating systems.

Based on the latest research results, Fraunhofer SCAI constantly improves and enhances AutoPanelSizer. AutoPanelSizer benefits from the expertise of the institute in optimization.
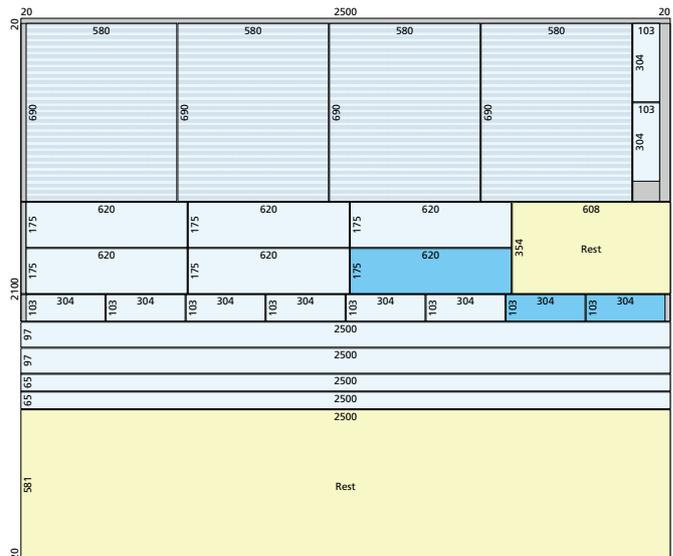
2) Cutting layout with reusable remnants: AutoPanelSizer balances between the production of optional parts (dark blue) and remnants. Striped parts may not be turned because of the grain. Overlength parts are not trimmed.
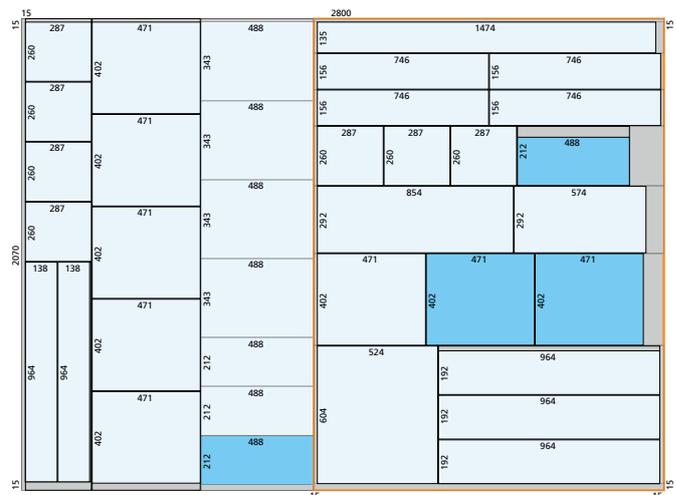
3) Cutting layout with head cut: The layout is divided into the "head plan" (on the left) and the "main plan" (outlined in orange).

Contact

AUTO
PANEL SIZER

08/22