

Optimal cutting and packing of the supporting rubber parts

The Industrial Problem

The company is interested in timely delivery, they want to establish an edge in delivery times compared to their rivals in the country.

Name of Research Group

Research
group



The research topics are Operations Research, Combinatorial Optimization, Global Optimization, and Numerical algorithms.

Company name

Company

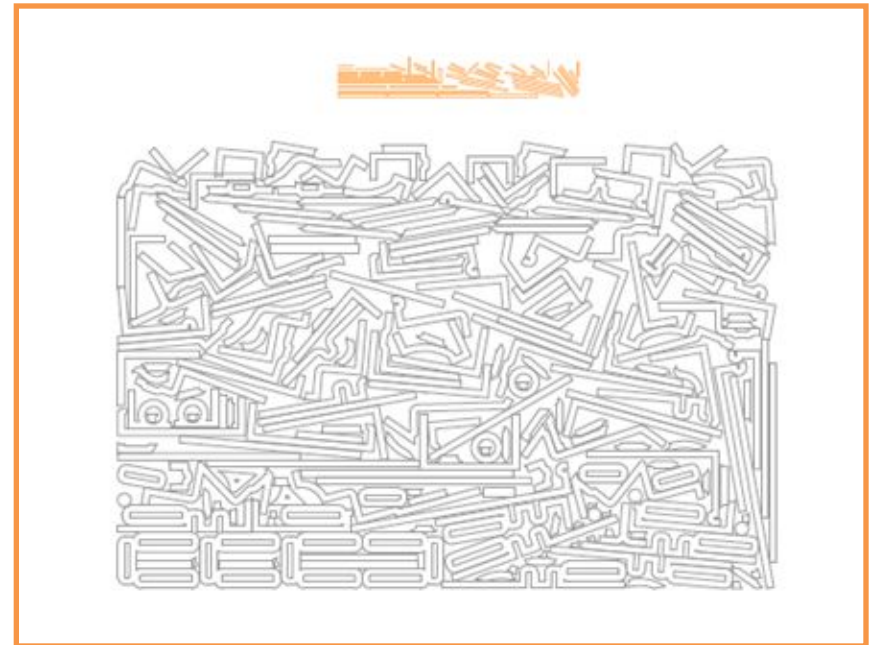
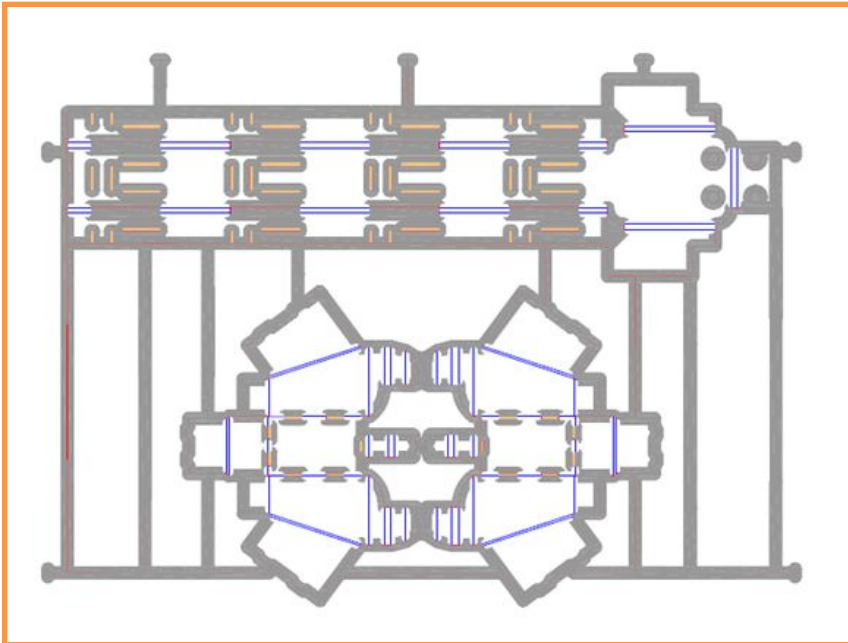


Stancforma Ltd. Is a professionally and stable family enterprise. They have the most versatile rule processing equipme

Optimal cutting and packing of the supporting rubber parts

Challenges & Goals

- Problem illustration
 - left, the stencil design with supporting rubber (gray and yellow)
 - right, the split and layed out rubber parts
- Our goal is to speed up and automate the design process
- The development of a software to automate the rubber splitting and layout processes

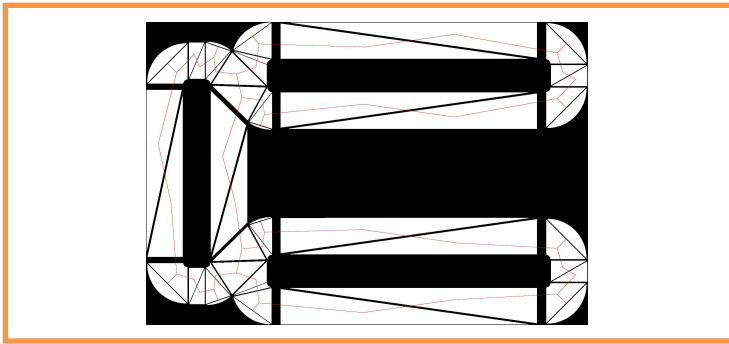


The original CAD file and the splitting rubbers.

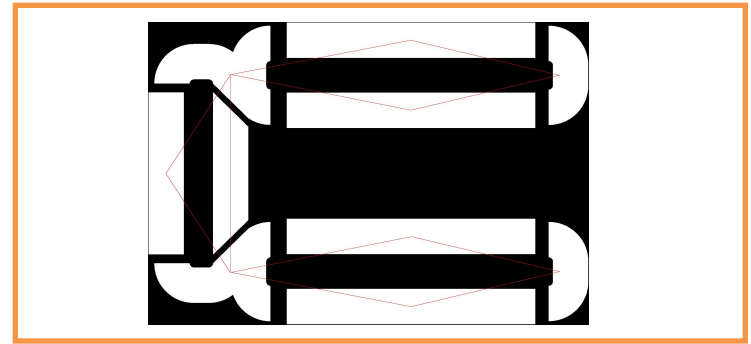
Optimal cutting and packing of the supporting rubber parts

Mathematical and computational methods and techniques applied

- Firstly merge shapes with too small area - Choose the best possible gluing
- Then merged shapes of acceptable area - Choose the best possible gluing and while the shape is improved by gluing
- Limit maximum size per dimension - Avoid too long shapes
- Give Score to shapes and mergings.



Possible cutting



Final cutting

Optimal cutting and packing of the supporting rubber parts

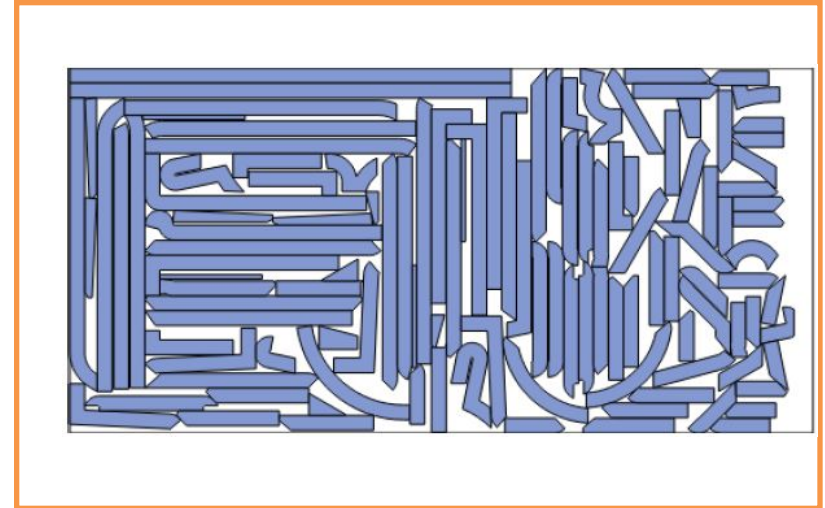
Results & Benefits to the company

We developed an application that is capable of processing significant steps of the fabrication process automatically

- Data import from the CAD files is implemented
- Splitting of the rubber parts is functioning
- Data export for the nesting algorithm is implemented
- Optimization of the layout is functioning
- Export of the layout is implemented
- Exporting the resulting layout in CAD format

Main benefits:

- decreasing the human processing time
- competitive advantage for the company



Optimal packing

The firm's major advantage is the fast and reliable delivery. This result is part of this advantage.