ExactFlat

SAVE TIME AND MONEY WITH FAST, ACCURATE 3D TO 2D FLATTENING FOR INDUSTRIAL FABRICS

EXECUTIVE SUMMARY

Every team designing with industrial fabrics faces the same problem: How to "flatten" a 3D design to make an accurate 2D cutting pattern. This process commonly requires many manual steps that can take weeks to complete.

This delay occurs when manufacturers go back to the traditional manual process. The process starts with CAD and ends with CAM... but in the middle is a gap with no automation.

No workaround, no feature built into CAD software, and no metal-flattening software solves this problem and supports end-to-end automation.

An ideal solution for this problem needs these requirements:

- Flattens 3D patterns quickly and accurately
- Supports file import/export with all major CAD programs
- Supports all major CNC cutting tables
- Demands next to no learning curve
- Designed specifically for industrial fabrics
- Proven in the field.

ExactFlat is a unique product that's been purpose-built to meet these exacting requirements.

Integrated with the popular CAD software Autodesk Inventor, ExactFlat extends the power of Inventor to solve the 3D flattening problem. In five simple steps, ExactFlat can accurately flatten the most complex 3D design in less than five minutes.

DESIGNING WITH INDUSTRIAL FABRICS IS
SLOW AND CO$TLY

Every team designing with industrial fabrics faces the same nagging problem: How to "flatten" a 3D design to create an accurate 2D cutting pattern.

Unlike solid materials, fabric stretches in two dimensions. This can easily create sag and stress that destroys the fit and finish of the final product.

This problem afflicts many companies that need soft goods as well as solid models:

- **Beyond the metal frame of a car or motorcycle, automotive manufacturers need seats, trunk linings, and saddlebags**
- **Furniture companies need cushions, seats, and mesh backs**
- **Boat makers need seats, canvas roofs, and boat covers**
- **Buildings need awnings or suspended roofs.**

But in many shops, it can take days or even weeks to go from a 3D design to a finished flat pattern ready for production.

The smallest design tweak means redoing the whole process from the beginning. Pattern-cutters must make numerous patterns using a tedious trial-and-re-trial method. The whole process is slow and costly, and makes collaborating with customers on new products slow and expensive.

A GAP IN AUTOMATION CAUSES A BOTTLENECK

The problem is really a gap in automation, where manufacturers must go back to an old-fashioned manual process that hasn't been updated for decades.

This gap occurs whenever a 3D design is released to production. As shown in Figure 1, the 3D design is created digitally, but then the physical prototype must be draped with actual fabric using manual trial-and-retrial techniques. The physical pattern created must then be digitized to generate a file that can drive a CNC cutting table.

So the process starts with CAD and ends with CAM... but in the middle, there is a major gap with no automation.
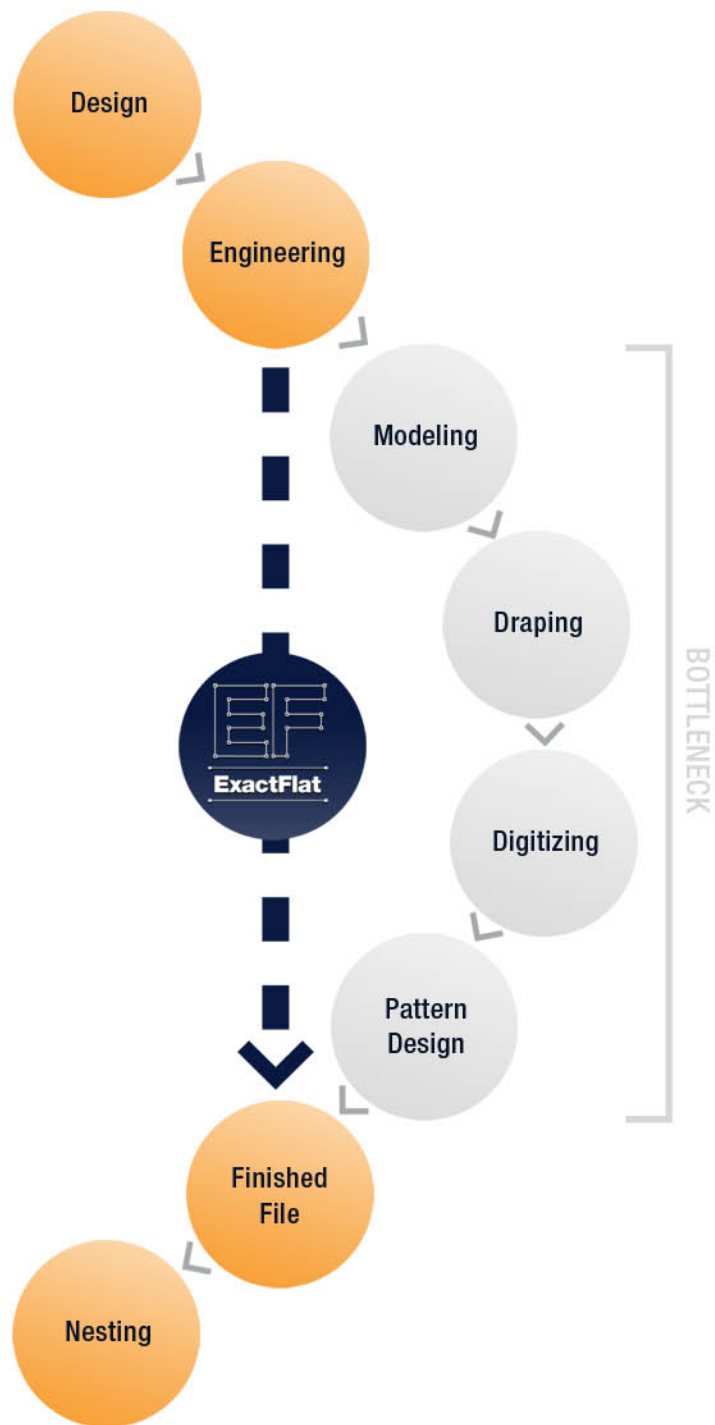
Design

Engineering

Modeling

Draping

BOTTLENECK

ExactFlat

Digitizing

Pattern Design

Finished File

Nesting

Figure 1

# NO OTHER SOFTWARE OR WORKAROUND SOLVES THIS PROBLEM

Some software vendors are aware of the 3D flattening problem, and a few claim to have solved it.

For example, one workaround is to **eliminate all Z-axis data points** in the 3D model. This might work for a perfect geometrical shape like a square box. But throwing away one-third of the design information won't help generate an accurate cutting pattern.

Some CAD software offers a feature to **"squash" a 3D model into 2D**. Again, this might work for a square box. But it won't work well for most shapes using industrial fabrics, which are rounded and curved in complex ways.

Some manufacturers try to use **sheet-metal flattening software** for their industrial fabrics. But metals are isotropic and do not stretch like anisotropic fabrics. That's why metal-flattening software can't generate accurate cutting patterns for fabrics.

The bottom line is that no workaround, no feature built into CAD software, and no metal-flattening software can truly create fast, accurate cutting patterns for industrial fabrics.
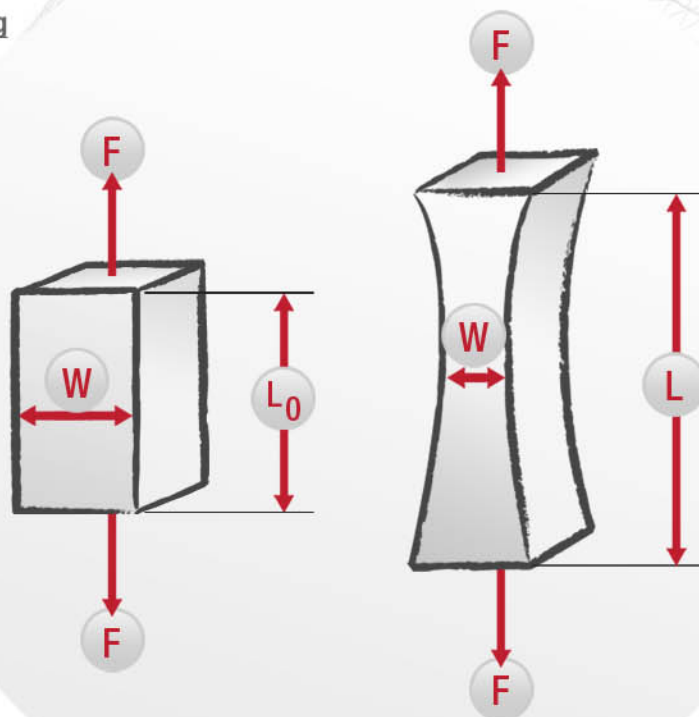
WHAT AN
IDEAL SOLUTION
SOLUTION LOOKS LIKE

An ideal solution would include all these capabilities:

- Flattens 3D patterns quickly and accurately
- Supports flexible file import/export with all major CAD programs, so everyone can continue working in their chosen environments
- Exports to file formats for all major CNC cutting tables
- Provides a simple interface that demands next to no learning curve
- Designed specifically for industrial fabrics
- Tested in laboratory setting and proven successful in the field
- Includes time-saving tools for related tasks such as seam allowances, notching, and grain lines
- Created by a technical team with 50+ years of industry experience
- Being used by some of the world's largest Fortune 500 companies

A product has been purpose-built to meet all these exacting requirements for manufacturers.
It's called ExactFlat.

WHAT IS EXACTFLAT?

3D to 2D Flattening Software
5 steps in 5 minutes to create an accurate flat pattern
Save Time > Save Effort > Save Money

ExactFlat is software that extends the power of Autodesk Inventor to solve the 3D flattening problem. In five simple steps, ExactFlat can accurately flatten the most complex 3D design in less than five minutes.

Despite its breakthrough speed and power, ExactFlat is remarkably simple to use. When installed, ExactFlat adds another toolbar to the Autodesk Inventor ribbon, so there's next-to-no learning curve. Your team will be using ExactFlat to optimize your workflow a few hours after it's installed.

There's nothing else on the market like this unique product.
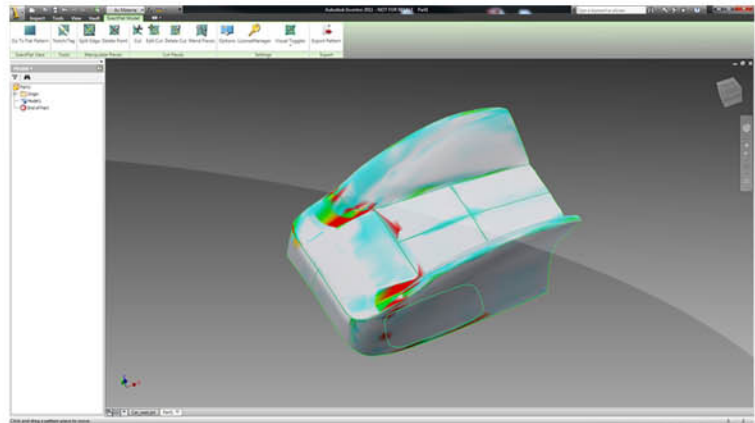
AN AUTOMATED PROCESS SAVES TIME, EFFORT, AND MONEY

ExactFlat supports a streamlined new process for creating 2D patterns with industrial fabrics.

This process takes only 5 steps in less than 5 minutes:

1 Open an existing 3D model in Autodesk Inventor.

2 Select the parts to flatten.

3 Flatten the selected parts.

4 Optimize the pattern to eliminate stress and sag.

5 Export the flat pattern.

The pattern file exported by ExactFlat can be used to drive any major CNC cutting table on the market.

This new process saves time by automating the traditional manual process. In most shops, this can save days or even weeks per product design.

This new process saves effort by streamlining the trial-and-re-trial of draping fabric over a physical prototype. Using the CAD data can generate a perfect fit on the very first try.

And this new process saves money by streamlining the release of every product design to manufacturing, and enabling your team to do more work in less time.

Manufacturers find that Autodesk Inventor plus ExactFlat pays for itself as soon as they generate a few patterns. The automation efficiencies are so significant that manufacturers not currently using Autodesk Inventor still see an ROI on the purchase of both ExactFlat and Autodesk Inventor within weeks.

This streamlined process enables a company to compress schedules, increase throughput, and reallocate skilled staff to other projects. And it helps manufacturers work closely with customers to perfect new product designs, easily generating a new pattern for requested revision.

CONCLUSIONS

ExactFlat for Autodesk Inventor is a unique new product that solves the 3D flattening problem. Manufacturers working with industrial fabrics, especially to create automotive, furniture and marine products, can use ExactFlat to save time, effort, and money.

TO FIND OUT MORE, ASK YOUR AUTHORIZED AUTODESK RESELLER ABOUT EXACTFLAT. TO TRY IT YOURSELF, VISIT WWW.EXACTFLAT.COM AND DOWNLOAD A FREE 30-DAY TRIAL.

ABOUT THE
COMPANY

Tri-D Technologies Inc., founded in 2008 and based in Toronto, Canada, develops and markets software products focused on optimizing the engineering design workflow. Engineers and designers across a wide range of industries - including automotive, marine, architecture, furniture, and fashion - incorporate Tri-D products into their workflow to get fast, accurate and simple results every time. For more information, visit www.exactflat.com.