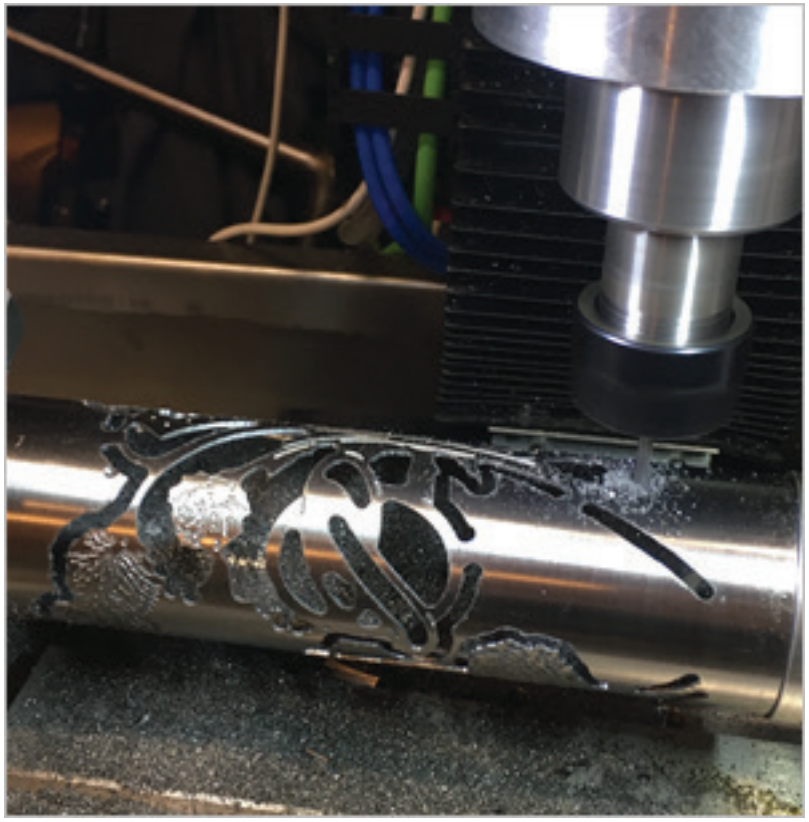
RhinoCAM & Pedalino Bicycles



While most of us (if we're lucky) get to follow our passion into the workplace, Julie Pedalino from Lenexa, Kansas has found a way to combine not one, but two passions into an exciting new startup at Pedalino Bicycles; one of just a handful of female custom bike frame builders in the world!

Julie graduated from The School of the Art Institute of Chicago and combines her awesome talent as a professional graphic artist with a passion for all things bike. Julie Pedalino and Pedalino Bicycles design some of the most beautiful custom bikes using Rhino 5 and RhinoCAM! We recently sat down with Julie to discuss her convergence of art, CAD/CAM and CNC technology into some of her most recent 4 Axis custom bike build projects.

We at MecSoft Corporation are both humbled and proud that our RhinoCAM software is helping to enable female machinists and entrepreneurs like Julie to experience the excitement and productivity of CNC technology. We hope you enjoy this inspiring success story!

Julie started learning about frame design by enrolling in Doug Fattic's frame building class in Niles, MI. She then mentored in machining with Warren Moore at Protocall Design in Lenexa, Kansas before launching Pedalino Bicycles; building custom bikes from design to production.

Julie starts by sitting down with the client to discuss the type of riding they want to do and the type of rider that they are. She takes body measurements for sizing and discusses how the client would like to see the frame personalized. She then custom builds the frame from tubular components, silver fillet brazing and other manual and CNC machining techniques and delivers a complete ready-to-ride custom bike to each client.

The design can include customized lugs, bilaminate sleeves, decaling, and other branding. This is where Julie's professional graphics design experience shines and also where Rhino and RhinoCAM come into play. Julie is able to merge her professional artistic talent, CAD/CAM and CNC technology to produce beautiful, award-winning bikes that make her clients proud.

"Once I tested RhinoCAM, it was like OK, this is what I want to use! RhinoCAM's ease of use made learning and understanding the concepts of CAM and g-code programming much easier, I think. I like how it's integrated into Rhino. I had no previous CAD or CAM training or experience and your CAMJam self-training video archive was very helpful to me and still is."

Julie Pedalino, Owner/Operator Pedalino Bicycles, Lenexa, Kansas

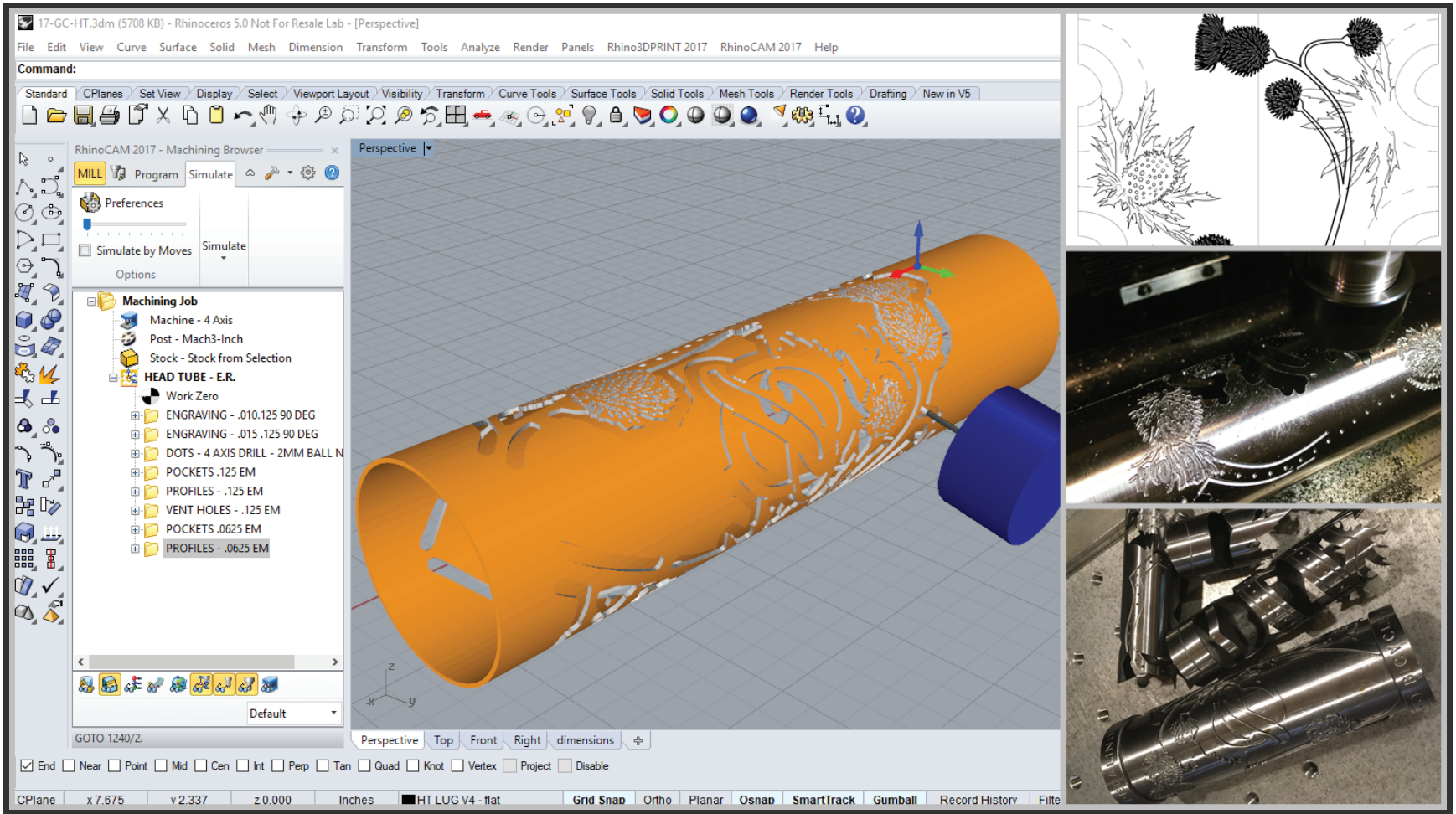
After seeing her custom bikes it is difficult to believe that Julie has been using CAD/CAM (Rhino & RhinoCAM) for less than a year at the time of this writing! When looking for a CAD/CAM solution, Julie wanted something not only affordable but that would allow her to more easily express her artistic abilities without getting overwhelmed with technical aspects of both CAD and CAM. Rhino provided the opportunity for more sculptural and organic modeling. After deciding on Rhino, RhinoCAM was then the logical add-on for the CAM programming, said Julie. Let's take a closer look at two of Julie's latest bike builds named Thistle and Trek.

Thistle

"This project is the most ambitious piece I've done so far… lots of 4 Axis engraving", says Julie. Shown below is the beautiful graphic design and 4 Axis RhinoCAM toolpaths for the front bilaminate sleeve for this custom made frame. This bike took 3rd place in the 2017 Philly Bike Expo! Be sure to check out the show photos below!

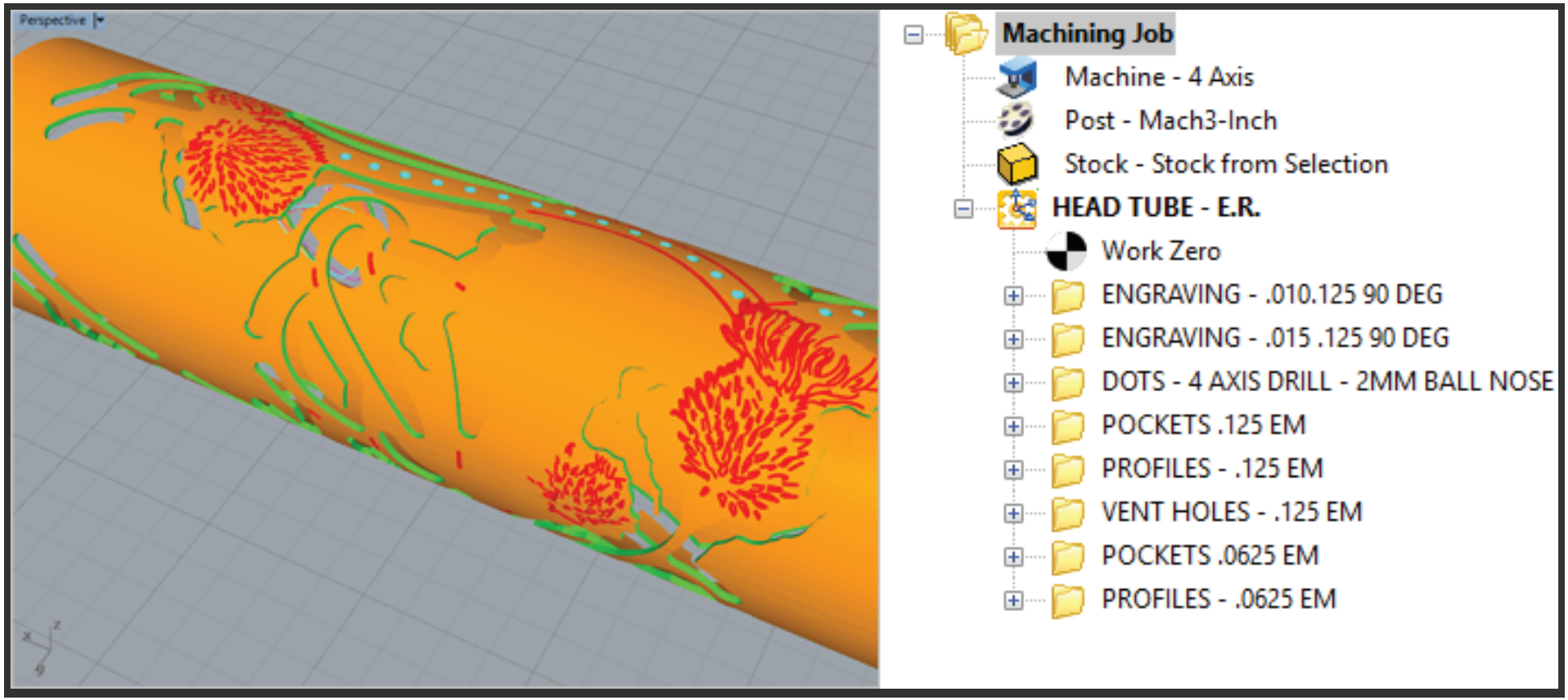
"I really like how RhinoCAM is easy to learn and makes CAM programming easy to understand! The integration with Rhino makes design changes much faster and the technical support is fantastic!"

The sketch was drawn digitally, converted to a vector line drawing and then loaded into Rhino where the geometry was wrapped onto the outer cylindrical tube sleeve surface. Using RhinoCAM's 4 Axis tool path strategies (Pocketing, Profiling, Engraving, and Drilling) the design is brought to life on her 4 Axis CNC machining center with Mach3 controller.



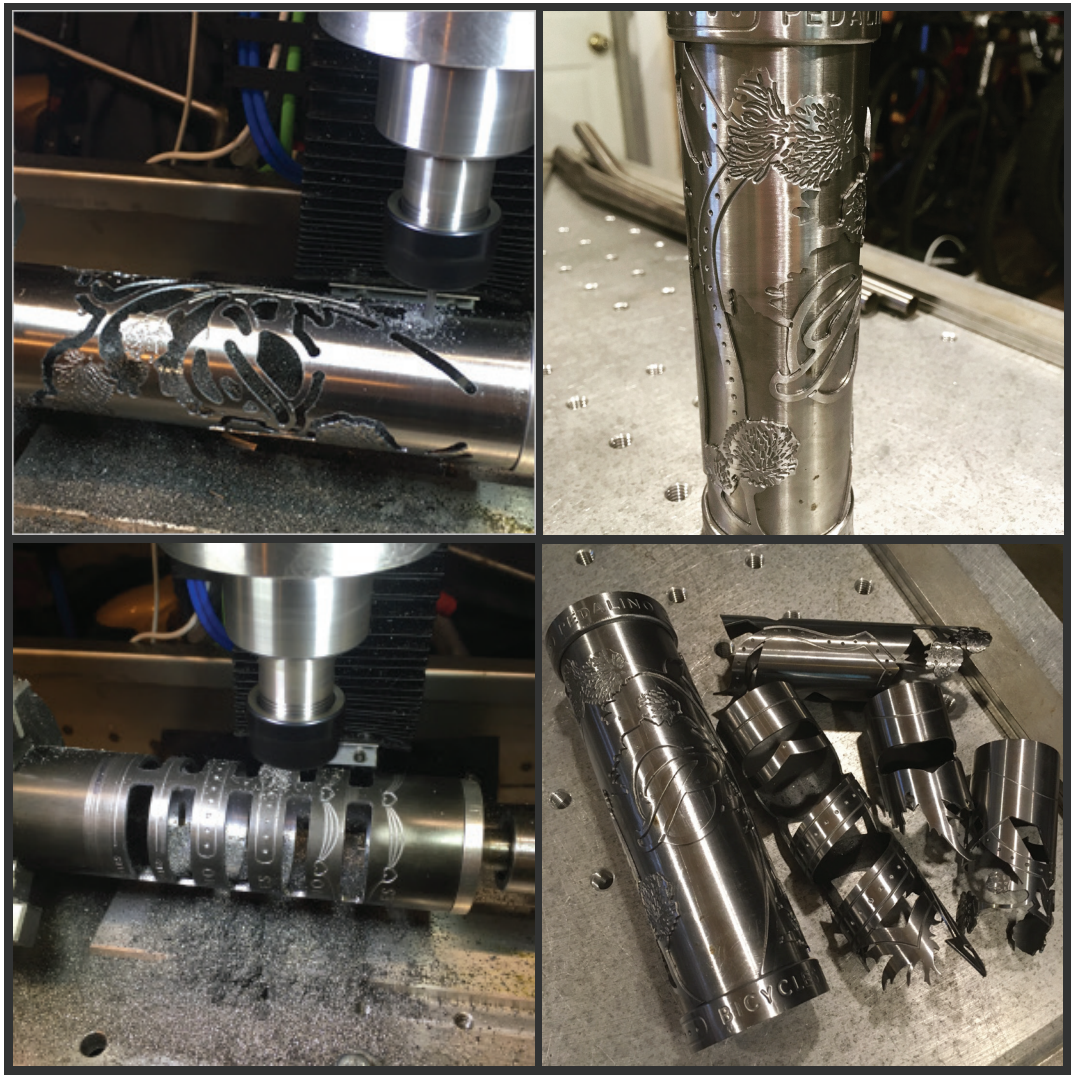
(Main Image) RhinoCAM is performing the cut material simulation of a 4 Axis Profiling tool path. Julie created the vector line drawing of her graphic design (Top Right) and wrapped it onto the cylindrical surface in Rhino. The 4 Axis CNC machining center and the completed component set are shown on the right.

Julie Pedalino is also a professional Artist & Graphic Designer! Here we see the awesome “Thistle” graphic artwork that Julie created for the 4 Axis RhinoCAM project shown above.



Here we see the RhinoCAM cut material simulation and 4 Axis Machining Job tree. Notice that the stock is a cylindrical tube of the same ID and OD of Julie's production chromoly steel 4130, using the Stock from Selection command in RhinoCAM. In the Machining Job we see that the first two operations are 4 Axis Engraving toolpaths (shown in red) followed by 4 Axis Drilling (shown in blue). The remaining operations are 4 Axis Pocketing and Profiling toolpaths (shown in green).

Be sure to check out the production and show photos below!



(Left) Julie's 4 Axis CNC machining center in action cutting RhinoCAM toolpaths from a chromoly 4130 Steel sleeve.

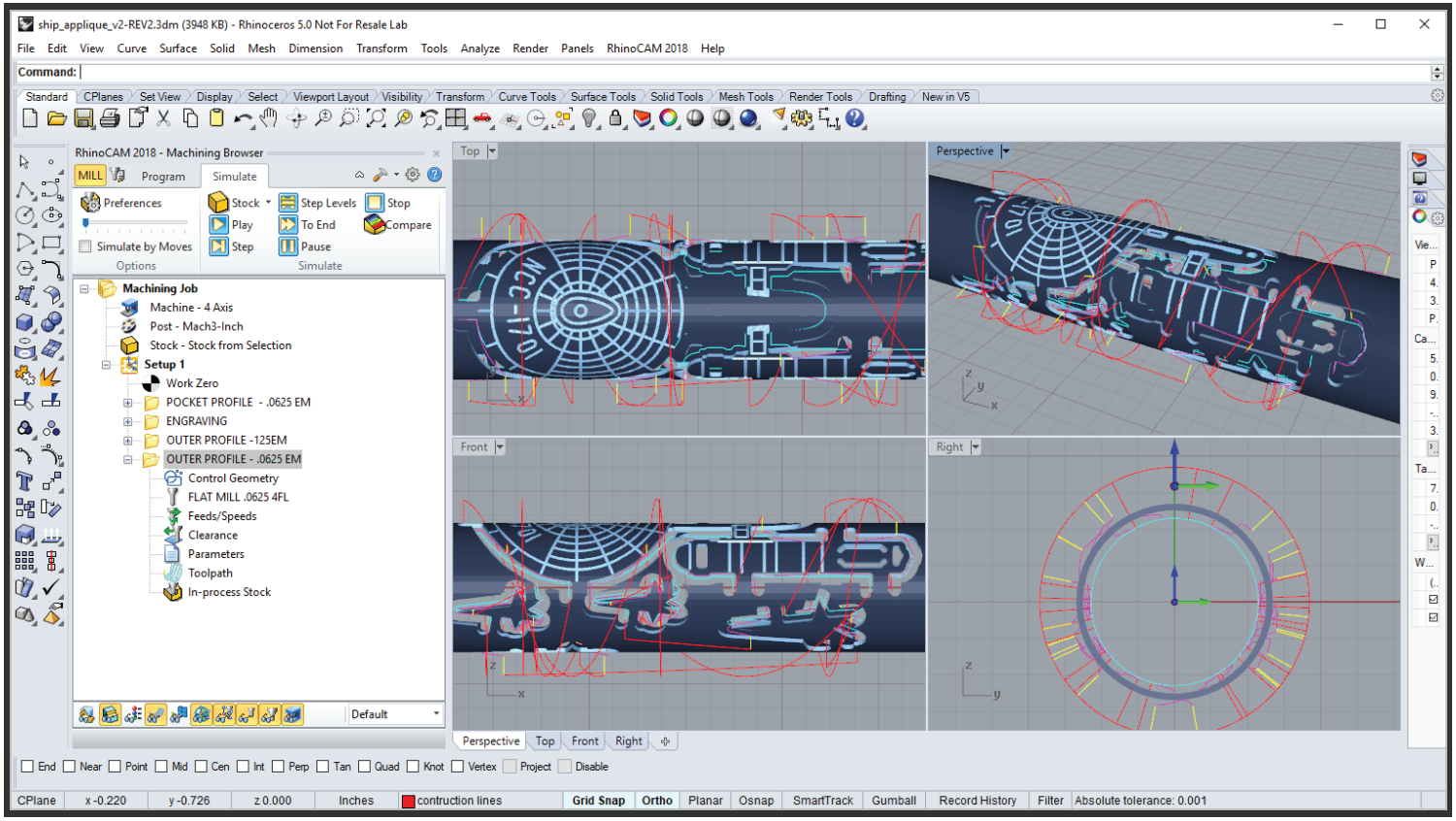
(Right) we see the completed Bilaminate Lugs with Sleeves.

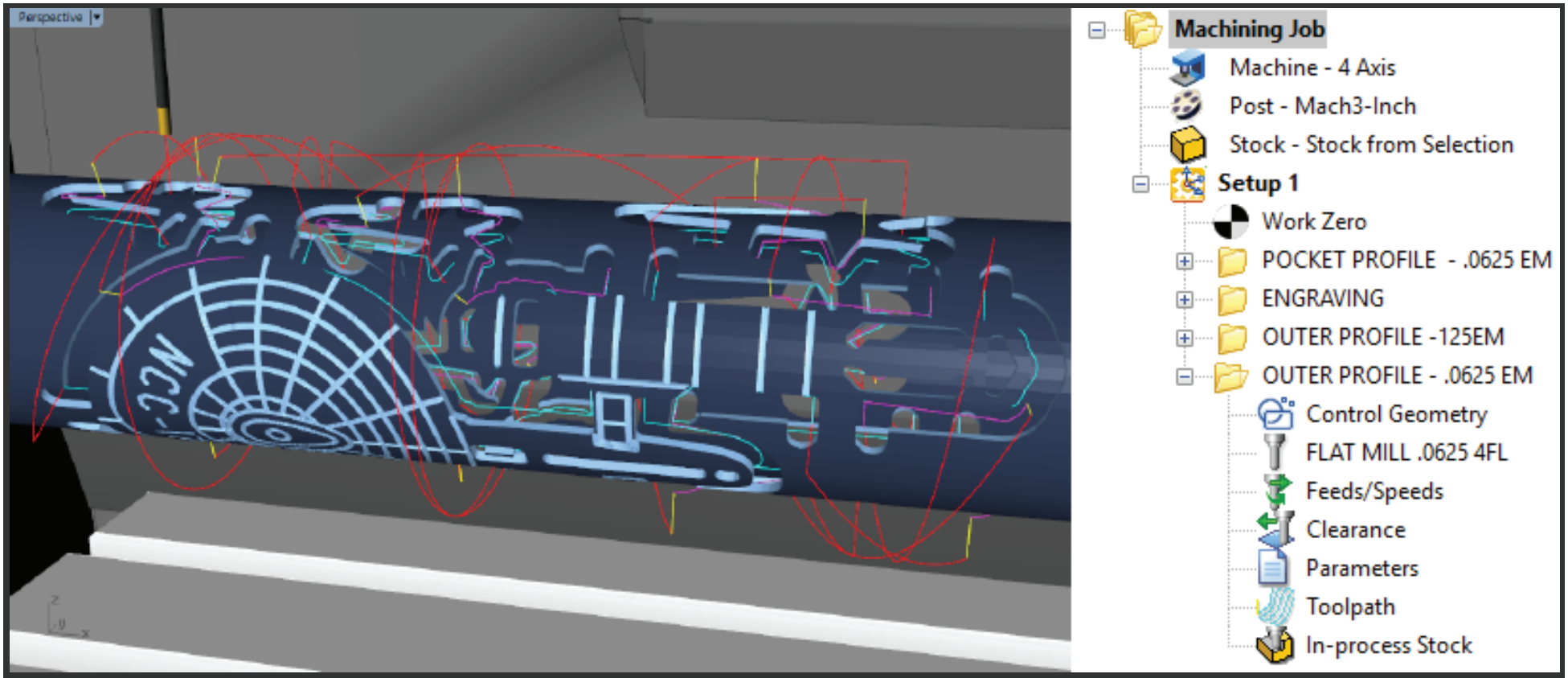
Here is the completed bike which took 3rd place at the 2017 Philly Bike Expo.
Editor's Note: Congratulations Julie, this bike is awesome!!

I know a few people who will enjoy this next design!

Trek

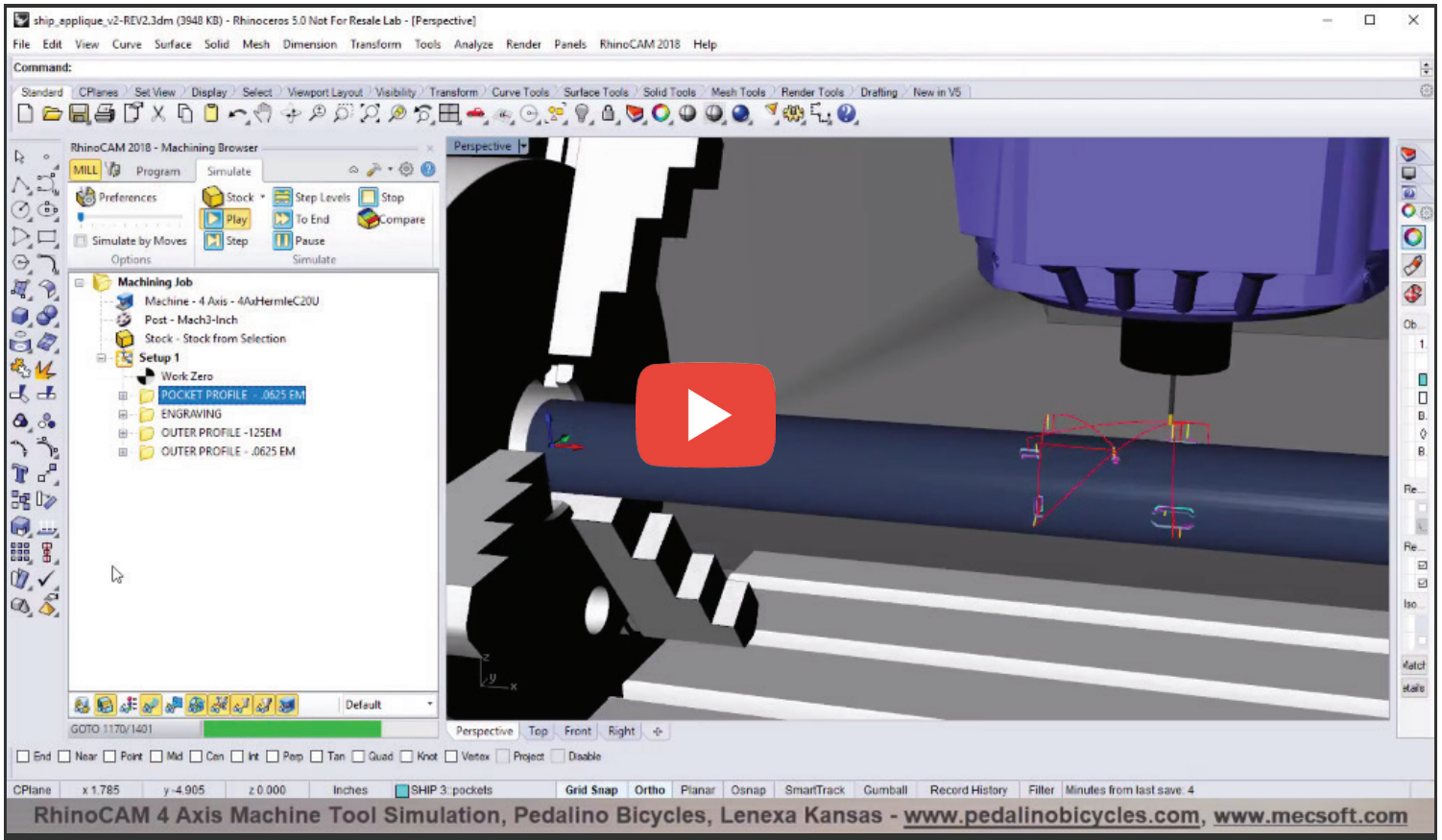
This project includes parts for a Star Trek themed bike! Another example of RhinoCAM's 4 Axis Engraving and Profiling together. After the piece is machined, Julie uses a hand tool to cut the tabs and remove it from the stock. After that, just a little bit of hand filing to crisp out the inner corners and remove the leftover bits from the tabs. This is a small amount of hand work, especially considering Julie previously would spend as much as 20 hours hand cutting these sleeves with a jeweler's saw!





Here we see the RhinoCAM cut material simulation (Top), machine tool simulation (bottom Left) and 4 Axis Machining Job tree (bottom Right). Again, the stock is a cylindrical tube of the same ID and OD of the production chromoly steel 4130 (Stock from Selection). In the Machining Job tree we see three 4 Axis Profiling toolpaths (using 0.062” and 0.125” Dia End Mills) and one 4 Axis Engraving toolpath (using a 0.062” Dia x 45 deg engraving “V” Mill).

Check out these two short simulation videos (see the completed bike photos at the end of the videos!).



4 Axis Machine Tool Simulation Video: https://youtu.be/k7xv_ujbejQ
4 Axis Cut Material Simulation Video: https://youtu.be/ApneQynwRPY

Here we see the “Trek” emblem bilaminate sleeve being machined on the 4 Axis machining center at Pedalino Bicycles along with the completed emblem.

Here is the completed bike shown at the 2017 Philly Bike Expo:

More about Pedalino Bicycles

We want to thank Julie Pedalino for allowing us to showcase her work at Pedalino Bicycles. To follow Julie and learn more about her exciting work we encourage you to check out these links:

- Pedalino Bicycles on the web and on Facebook and Instagram
- Pedalino Bicycles in the news
- Pedalino Bicycles at the 2017 Philly Bike Expo

More about RhinoCAM

RhinoCAM - MILL is available in 5 different configurations (Express, Standard, Expert, Professional and Premium). The parts shown here were programmed using the Expert configuration. Here are some additional details about each of the available configurations. For the complete features list, visit the RhinoCAM Product Page.

- **RhinoCAM MILL Express:** This is a general purpose program tailored for hobbyists, makers and students. Ideal for getting started with CAM programming. Includes 2 & 3 axis machining methods. Includes ART & NEST modules as well!
- **RhinoCAM MILL Standard:** This configuration includes everything that is in the Express configuration and additional 2-1/2 Axis, 3 Axis & Drilling machining methods.
- **RhinoCAM MILL Expert:** Suitable for 4 Axis rotary machining. Includes the Standard configuration plus 4 Axis machining strategies, advanced cut material simulation and tool holder collision detection.

- **RhinoCAM MILL Professional:** Ideal for complex 3D machining. Includes the Standard and Expert configuration plus advanced 3 Axis machining strategies, 5 Axis indexed machining, machine tool simulation, graphical toolpath editing and a host of other features.
- **RhinoCAM MILL Premium:** Tailored for complex 3D machining with both 3 Axis and full 5 Axis methods. Includes the Standard, Expert and Professional configurations plus 5 Axis simultaneous machining strategies.