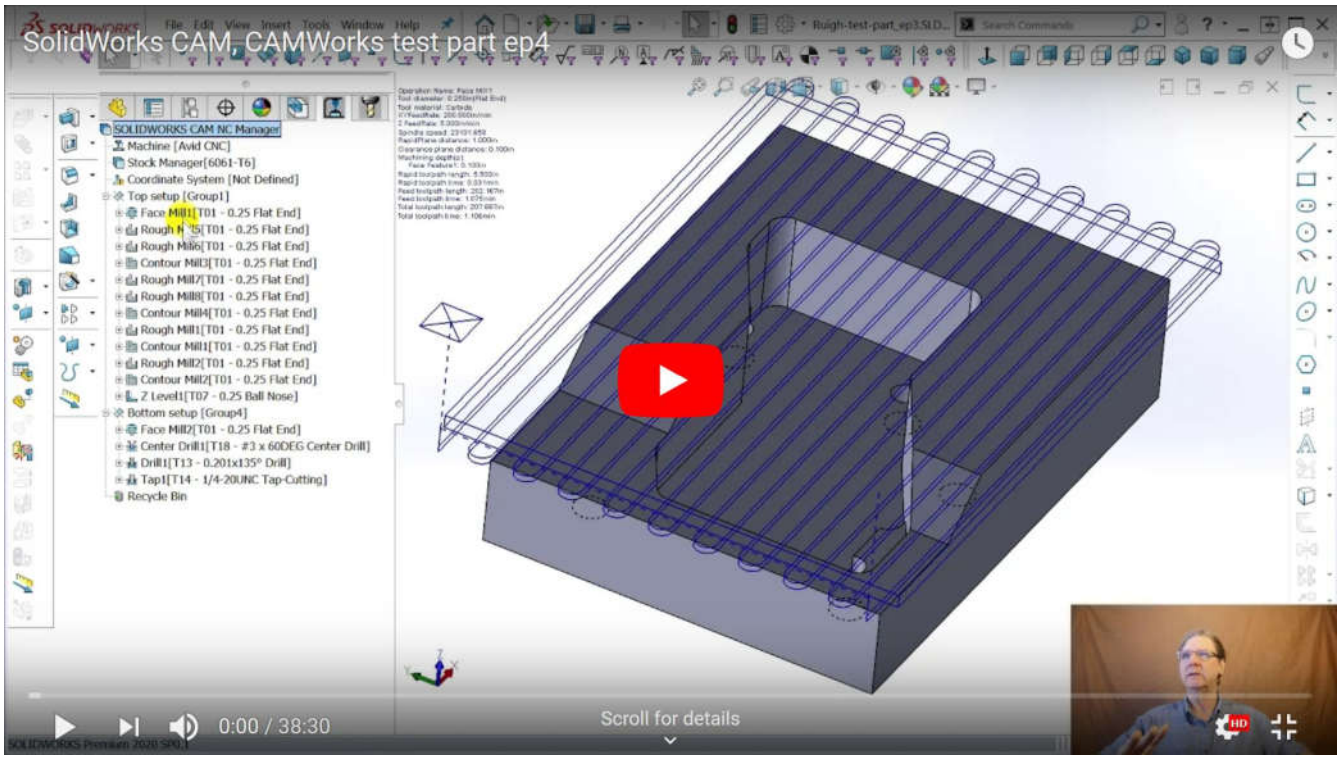
RAKO STUDIOS

Solidworks CAM, CAMWorks test part ep4 (youtu.be/62g4beY9FnM)

SolidWorks 2018 and later has a free CAM (computer-aided manufacturing) add-in to make G-code for milling machines.



Original part auto-recognized here.
Test part after pockets in episode 1 here.
Test part after holes in episode 2 here.
Test part after 3D in episode 3 here.
Test part after this episode 4 here.

In this episode I touch up stuff to get this program closer to going to the ship floor. I made a mistake doing the 3D feature last episode, and fix that. Then I consolidate tools to use the 1/4" end mill wherever I can. After that I consolidate operations and adjust feedrates. I also set part-zero for both setups.

When SolidWorks CAM / CAMWorks was set to its 30HP default mill, the time to make the part was 27 minutes. When I changed the 1/2" and 2" tools to use the same 1/4" tool as the rest of the part, cutting time went to 50 minutes. When I changed the machine definition to double the spindle speed to 24,000 RPM like my Avid Benchtop Pro, time went down to 30 minutes. Then I consolidated rough-finish operations into a single operation and maximized the speeds and feeds. This resulted in a cutting time of 15 minutes. My machine is not stiff enough, it is a goal.

Last night I looked inside the Technology Database that defines the machines, the tools and the operations. I noted that the 600 tables (!) in the database had all the inch tools tacked on at the end. That and some syntax in a dialog box made me suspect the programming of CAMWorks is outsourced.

Looking into the company history, sure enough, it was "demerged" whatever that means, and acquired by an Indian IT services company. This makes me surmise that CAMWorks, facing the high cost of programming talent, outsourced the programming. I joke with my programmer buddies that if you hire one programmer to clean up a webpage or design a script file, in three years you will have a department of 20.

That might be worth a chuckle, but the fact is that software is about the most complex thing humans do for a living. Many a small company has been eaten up by the cost of developing a program. I suspect that the outsourced programmers were so good, or were requiring most of the revenue, that CAMWorks just decided to give itself to the IT outsourcing company.

The good news is that this means there should be some first-class international-quality talent working on CAMWorks. The bad news is that the program may lack the cohesiveness and overall interface. It seemed to me that every feature had a different way of being defined, with different dialog boxes. This can happen when the task is outsourced, and the oversight is hard to do from 5000 miles away.

This "demerger" happened in 2016, so that means CAMWorks has most likely stabilized and we can look to continuous improvement in the user interface and capabilities. While I don't put much stock in the "automatic" feature recognition, the simulation in CAMWorks / SolidWorks CAM is much better than some of the other mid-range CAM packages I see. That appeals to me as a "newbie," since I want to make sure I know what the G-code is doing.

Another plus is I believe the simulations are run from the G-code itself, not the internal program paths. Visual Mill sells a separate G-code editor, that has simulations, so I wonder if their CAM package uses the G-code or the internal file data to do the cutting simulations.

I still won't feel confident about what I am doing until I make some chips on the mill. I would never start with a part as complex and tricky as this test part. My pal Dave Ruigh designed it to trip up CAM packages. I had a machinist buddy tell me that this type of part would even trip up MasterCAM, the $10,000+ package that dominates the industrial market.

I might revisit that first part I played with in the first-, second-, and third impression videos. I know a lot more about how SolidWorks CAM operates now. Things that befuddled me just a week ago now seem obvious. I guess that is the way it is with all software. That is why I wanted to make these videos as I learned, and without talking a 2-week training course first.

I will be an infrequent user of any CAM package I buy. That is why it is critical to me that its interface be intuitive. I am in contact with BobCAD CAM, and EZ Mill, and several others to get their programs up on my computer, to see how I like those.

My pal Dave says I should try to get a package with full 3D capabilities. That can get expensive, but I do have some parts that would benefit from full 3D, as opposed to the 2.5D in this free SolidWorks CAM. To get a perpetual license and more features is $3,000 including maintenance, 3D is $7000 with maintenance.