



August 30, 2024

Dear Optimizer® User:

Thank you for your investment in Optimizer (aka VO), an important part of your NC programming and machining process!

Optimizer was created to provide an optimization solution to improve most all NC Programs (G-Code or Apt/CL) from a CAM system or straight off the CNC Machine.

Simply provide VO a stock model, cutting tools and an NC Program and 'just optimize'.

VO key features will be described in the following pages. Please take a moment to review what's in this release so you and your company can take full advantage of this latest optimization technology.

Maintenance and Licensing Information

Optimizer is a Cloud licensed application

To Get a License – use the link below to submit a License Request:

http://www.cgtech.com/vericut_support/request-license/

Optimizer runs on 64-bit Windows, and is supported on Windows 10 and 11 computers.

Software maintenance keeps you on the cutting edge - CGTech provides updated software to customers with current software maintenance. Your continued maintenance ensures that you have the most advanced verification technology available.

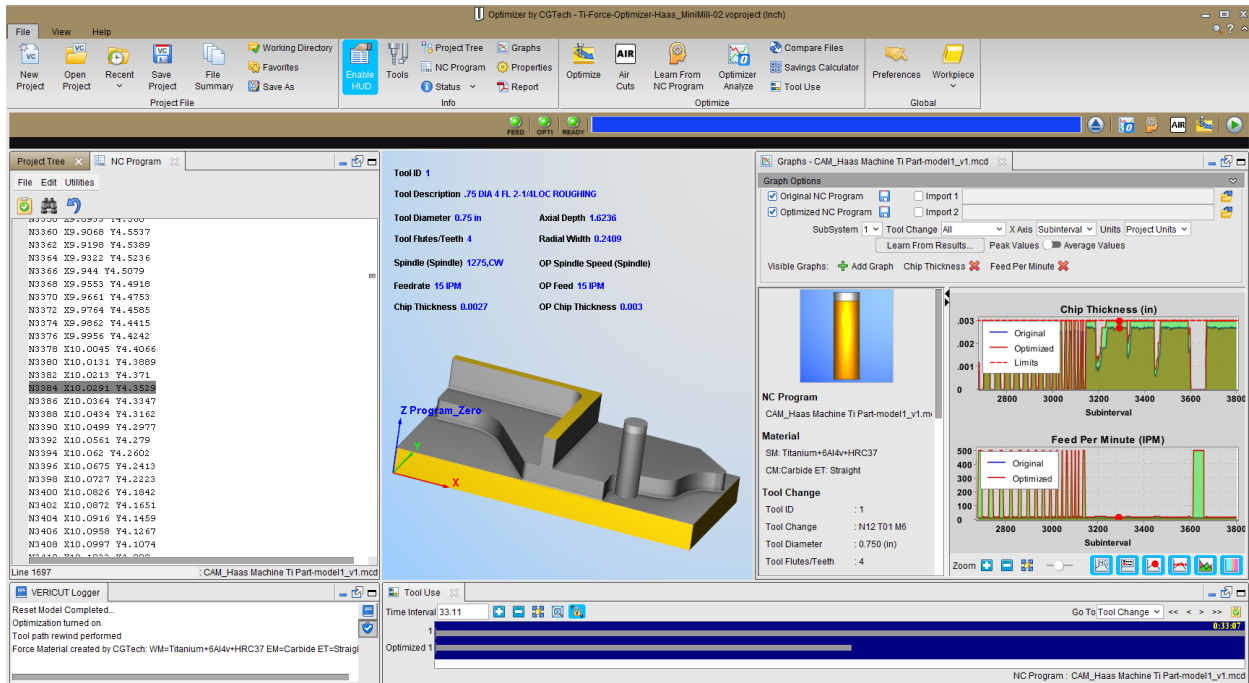
For any pricing information please contact your CGTech representative (<http://www.cgtech.com/about/contact-us/>).

Sincerely,

Ely Wahbeh

CGTech Vericut Product Manager

Optimizer Release Notes



What's in Optimizer (VO)

VO is a standalone application that enhances NC program efficiency using physics-based optimization. VO optimizes APT/CL-file or post-processed "G-code" NC programs output from almost any CAM system, for use on standard 2-axis, 3-axis or 4/5-axis (multi-axis) NC machines, making it a versatile optimization tool for a wide range of NC manufacturing environments. VO focuses solely on cutting and optimizing to produce highly optimized NC programs that enable each tool to remove material under its ideal cutting conditions. This results in reduced machining times, extended tool life, and improved part quality across a wide range of NC manufacturing environments.

VO Features

- **Project Tree** is used to provide the inputs required for setting up optimization jobs.
- **Graphs** provide the ability to visually see the actual cutting and predicted optimal conditions of the NC program. Ability to contrast original NC Program (before) and optimized NC program (after) in the Optimizer.
- **Savings Calculator** displays the time savings and calculates the dollar savings.
- **Flexibility** to use Analyze, Learn from NC Program, Optimized Air Cuts only, Optimize and pause / play simulation.
- **NC Program Review** has the capability to step through the original and optimized NC Program with graphics and graphs all synchronized together.
- **Compare function** to compare original versus optimized NC programs.
- **Tool Manager** designed to import or define cutters, Stock Material Records (SMRs).
- **Force Material Catalog (FMC)** catalog of more than 150 dyno tested Stock material-Cutter combinations + "alias" material names.
- **VERICUT Tool Performance Data (TPD)** industry recommended feeds & speeds for common cutter types.
- **Interface:** with several CAD/CAM software for easy transfer of data from the CAD/CAM to VO.

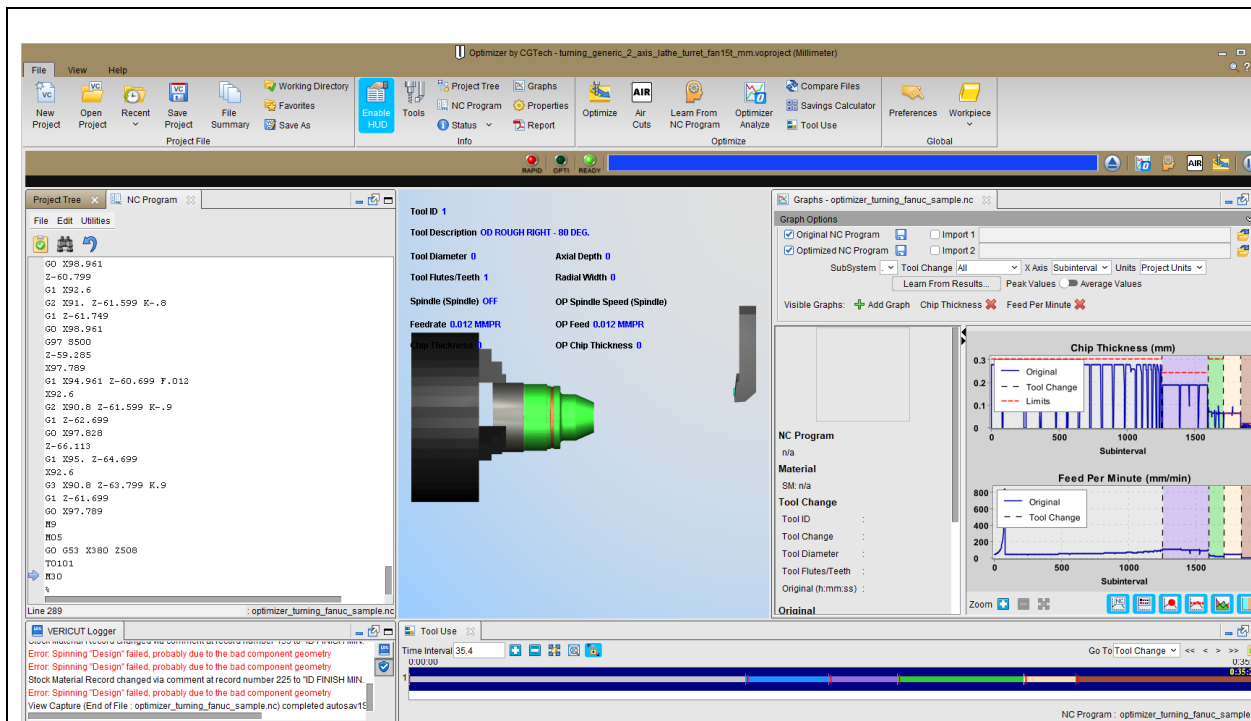
Optimizer (VO) Release Highlights

Cloud licensing

VO uses Vericut Cloud Licensing for easy installation and software maintenance.



Optimizer



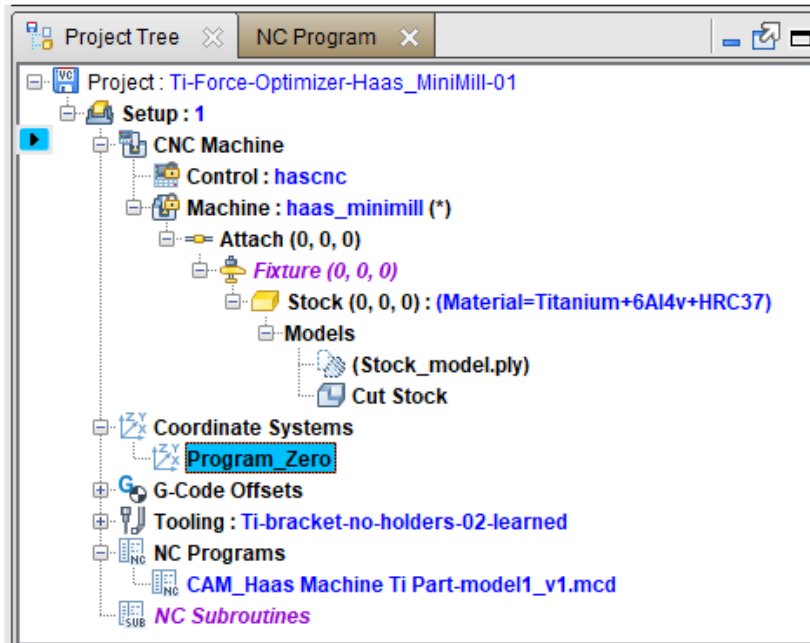
Optimizer (VO) software has been customized to focus solely on NC Program optimization based on how the NC Program and defined cutting tools remove material. VO optimizes 3-axis milling, 5-axis Milling or turning programs. The window layout presents easy access to all the necessary tools for optimization.

The inputs for optimization are:
Stock Material, Cutting Tools, and an NC Program

Optimizer Release Notes

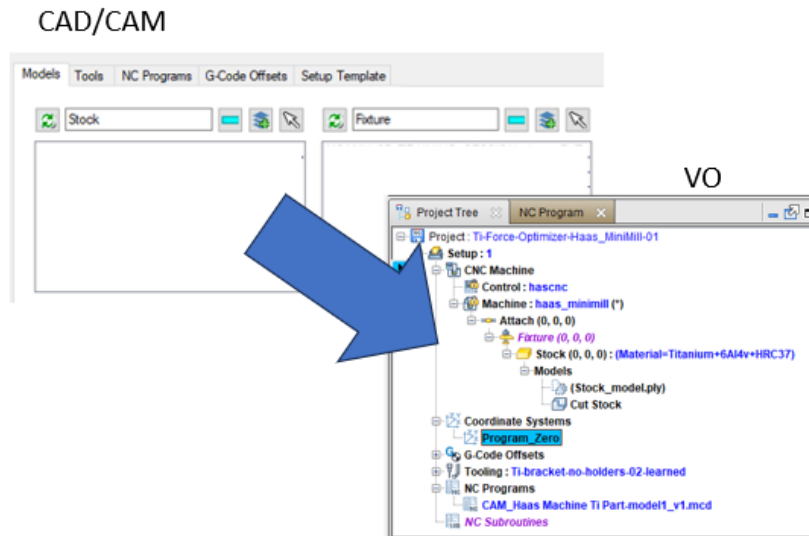
Project Tree

The Project Tree is where the project setup information is located. The CNC Machine (Control and Machine combination) are provided by CGTech. Fixture model is optional. Stock model, Stock Material designation, Coordinate systems, G-Code Offsets, And NC Programs are organized here. This data can be imported manually or with an interface.



CAD/CAM Interfaces

CAD/CAM interfaces are designed to simplify the data transition from the CAD/CAM system to VO. The interface will export the manufacturing data to VO with the project ready to just optimize.

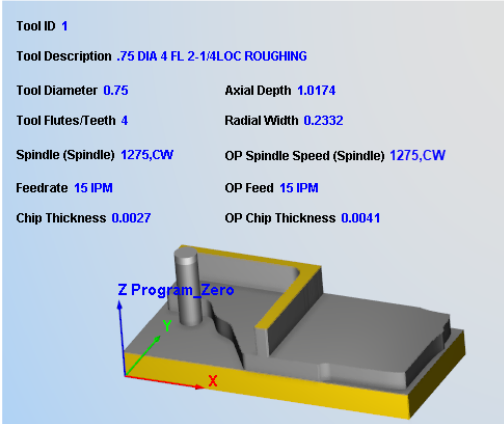


Optimizer Release Notes

“Just Optimize” menu

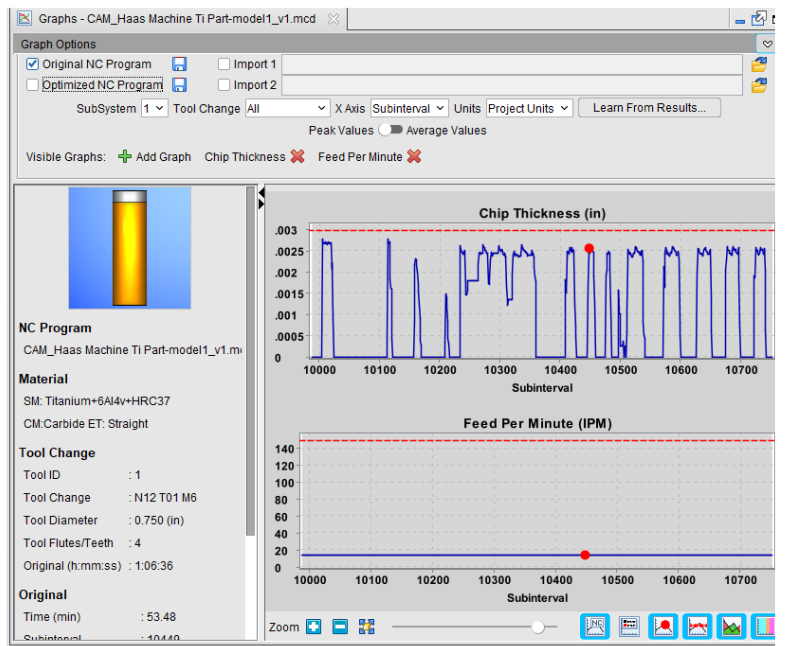
<p>VO is ready to optimize – just press optimize. Other options are to Analyze, Learn from NC Program, Air Cuts, Optimize and pause / play.</p>	
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Head Up Display (HUD)

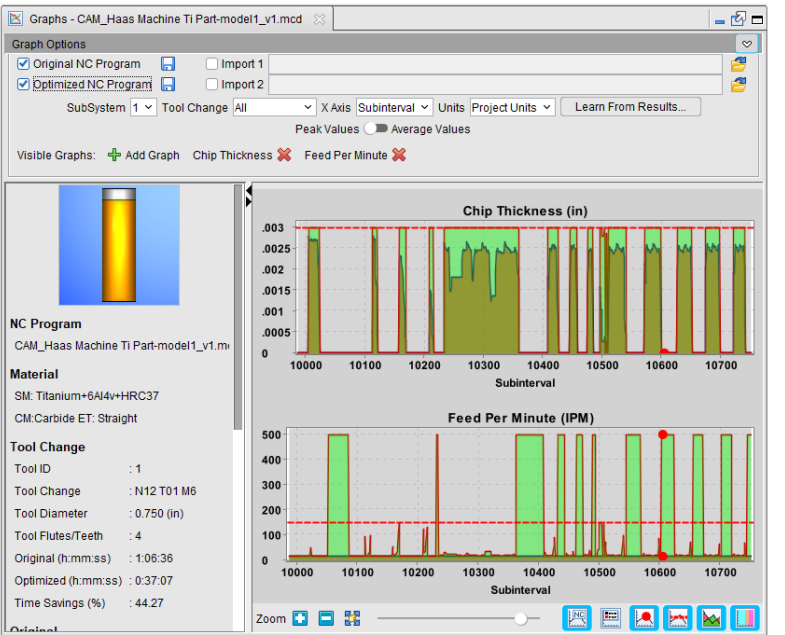
<p>VO includes a preconfigured HUD that provides valuable optimization information. Tool information including the tool ID, Description, Diameter and Flutes/Teeth. Performance information like Spindle Speed, Feedrate, and Chip thickness (original and optimized values). Also cut depth and width all displayed block by block of the NC Program.</p>	 <p>Tool ID 1 Tool Description .75 DIA 4 FL 2-1/4LOC ROUGHING</p> <table><tr><td>Tool Diameter 0.75</td><td>Axial Depth 1.0174</td></tr><tr><td>Tool Flutes/Teeth 4</td><td>Radial Width 0.2332</td></tr><tr><td>Spindle (Spindle) 1275,CW</td><td>OP Spindle Speed (Spindle) 1275,CW</td></tr><tr><td>Feedrate 15 IPM</td><td>OP Feed 15 IPM</td></tr><tr><td>Chip Thickness 0.0027</td><td>OP Chip Thickness 0.0041</td></tr></table> <p>Z Program Zero</p>	Tool Diameter 0.75	Axial Depth 1.0174	Tool Flutes/Teeth 4	Radial Width 0.2332	Spindle (Spindle) 1275,CW	OP Spindle Speed (Spindle) 1275,CW	Feedrate 15 IPM	OP Feed 15 IPM	Chip Thickness 0.0027	OP Chip Thickness 0.0041
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Optimizer Graphs

Optimizer graphs are a great way to visually see the true cutting conditions of the original NC Program. Varying chip thickness is a primary indicator of poor cutting conditions and exposes the need for optimization. Notice the Chip thickness graph (blue lines). See graph below for the results after optimization.



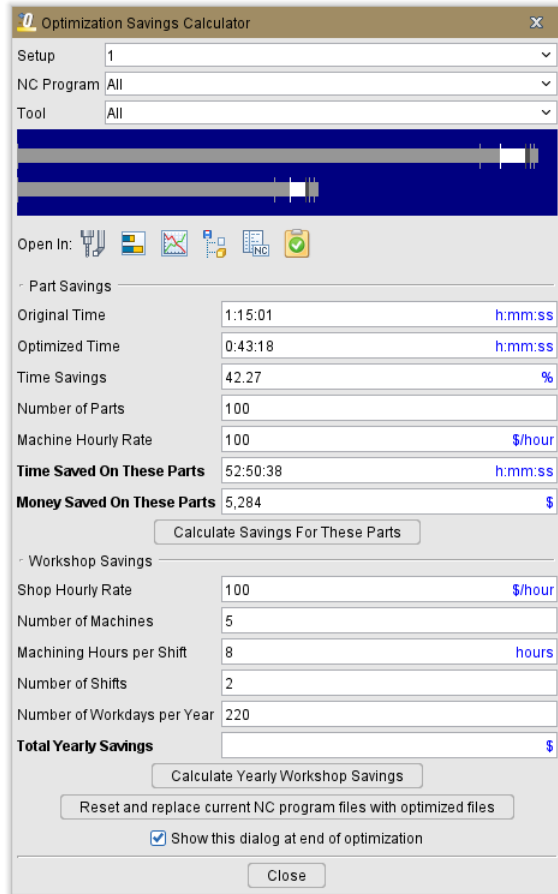
Optimizer graphs show the before and after condition superimposed. The dark green is the original NC Program results. The light green is showing the optimized/improved NC Program.



Optimizer Release Notes

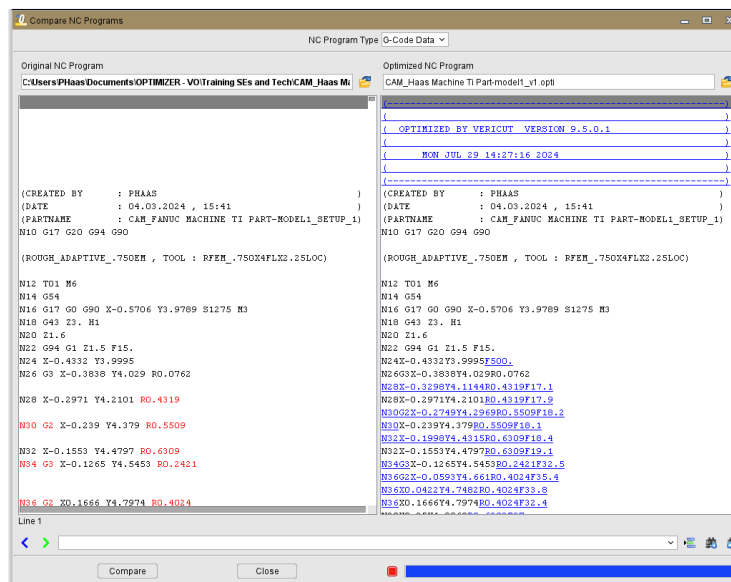
Savings Calculator

The Optimization Savings Calculator will display after optimization is complete, showing time savings and allows the user to plug in their relevant data to quantify savings from optimizing.



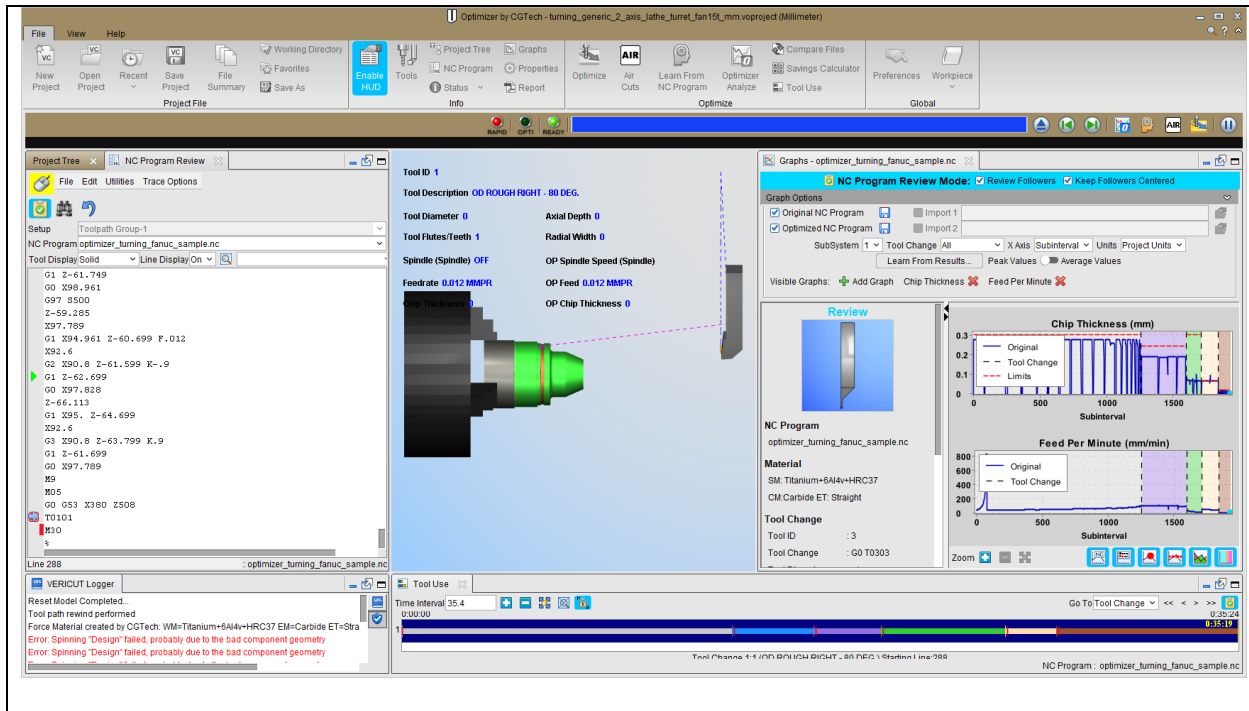
NC Program Compare

VO provides the ability to compare side-by-side the original NC Program to the optimized NC program.



Optimizer Release Notes

NC Program Review



NC Program Review is an analytical tool used to investigate the cutting conditions, block by block. This feature will allow the user to see the NC program code, the cutter location in the graphics area, and the corresponding location in the Optimizer graphs.

Right-mouse button Popup Menu with optimization shortcuts

VO is designed for optimization and the mouse wheel has been customized with all the optimizer functions for quick optimization.

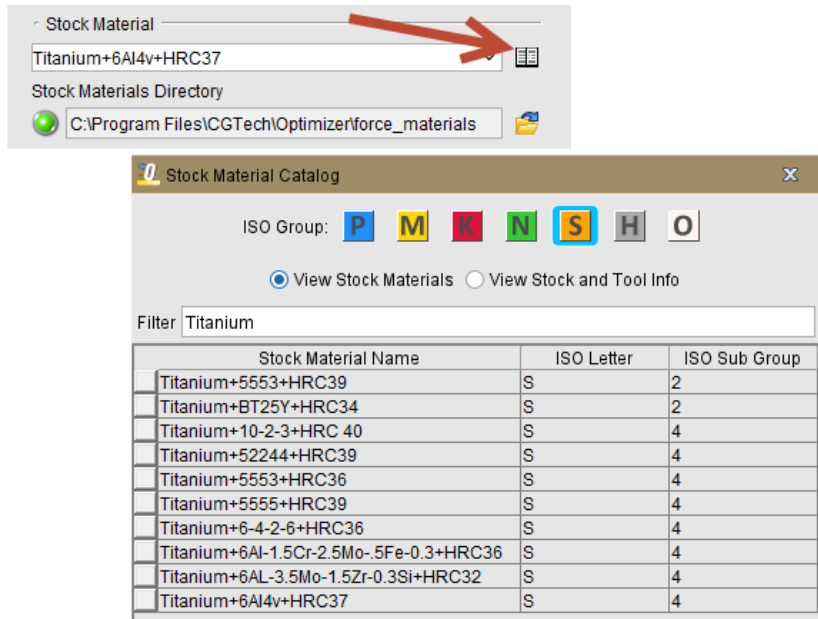


Optimizer Release Notes

Stock Material Catalog (SMC)

VO includes over 150 dynamometer calibrated materials for stock material selection and thousands of Alias' for equivalent material identification. Type any material id into the filter and the SMC will find the equivalent.

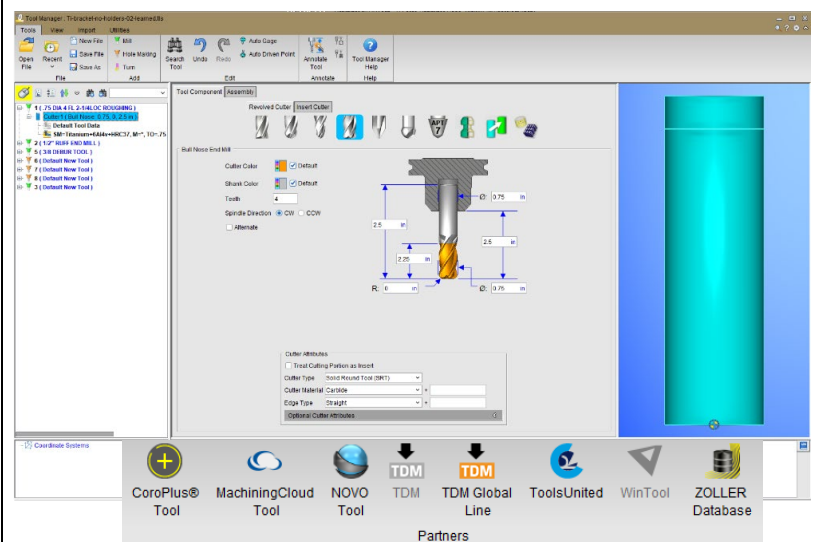
Users can select the ISO Group and then select their material from the list or use the filter to narrow down the list.



Tool Manager

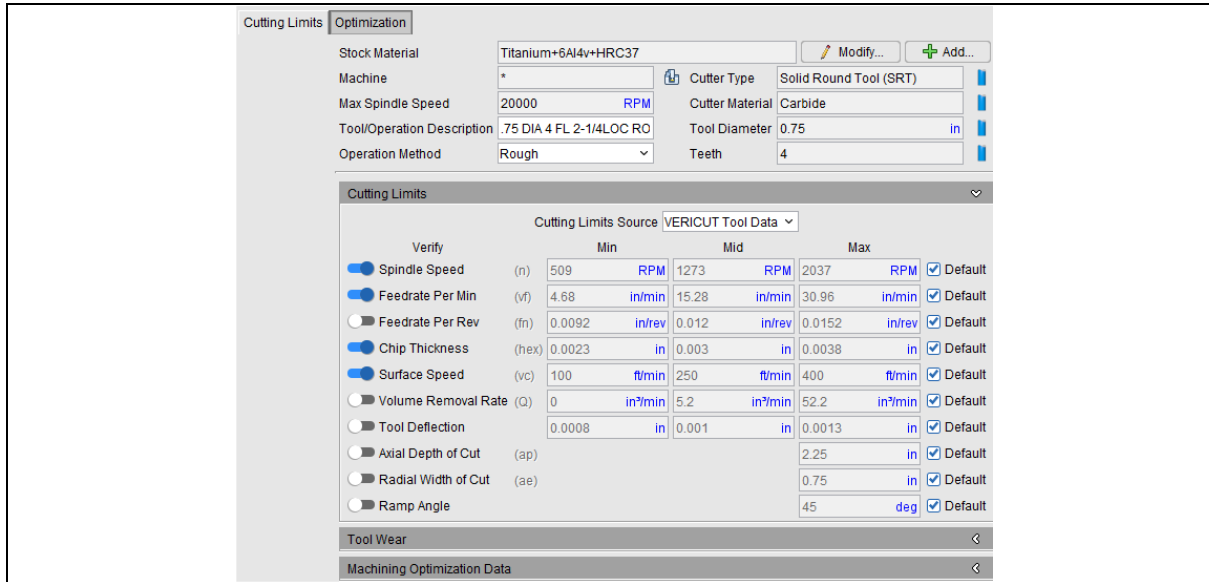
VO includes Tool Manager which is used to create or import cutting tools, and configure settings for optimization.

Users can import cutting tool data from CoroPlus Tool Library, MachiningCloud, Novo, TDM, ToolsUnited, and Zoller.



Optimizer Release Notes

Cutting Tool Performance Data



VO includes cutting tool performance data aka Cutting Limits, Vericut Tool Data that provides feed and speed starting recommendations for almost every cutter type and all the materials in the stock material catalog.

The image above shows an example of a 0.75 diameter 4 teeth, carbide endmill for cutting Titanium-6Al4v stock material.

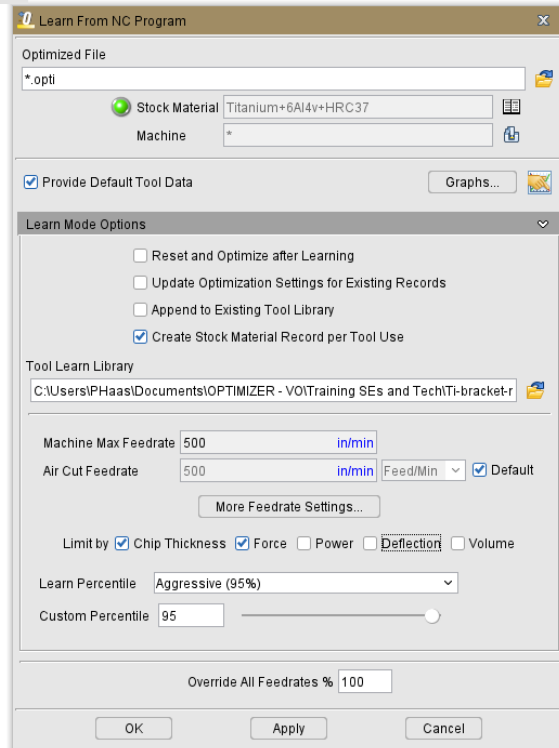
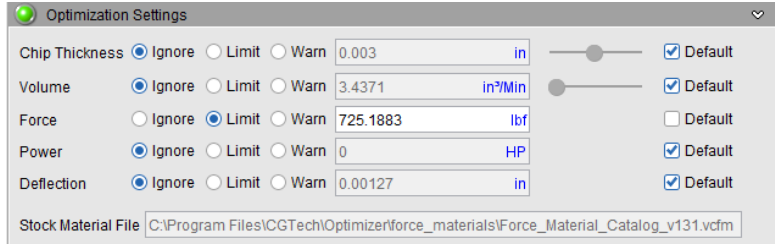
Notice this data includes recommended ranges and not just one value.

Optimization settings can be imported from the Vericut Tool Performance Database, which pulls information from "Vericut Tool Data" source that is supplied with a VO install. It contains performance data for all cutting tool types including solid, round tools and indexable tools.

Optimizer Release Notes

Optimization Settings

Optimization settings can be obtained from the generic Vericut Tool Performance Data, learned from the NC Program, or entered by the user.



Optimizer Release Notes

Reports

VO includes the ability to output an optimization results report to review critical tool and performance data in PDF form.

Tuesday, July 30, 2024 15:59:24 GMT

Part Number	Stock Material	Machine
CAM_Haas Machine Ti Part-model1_v1.mcd	Titanium+6Al4V+HRC37	-

CYCLE AND PROGRAMMING INFO

Machine Time (h:mm:ss) 1:15:00 Total ERRORS: 0
 Optimized Time (h:mm:ss) 0:41:08 Total WARNINGS: 0
 Time Difference: 45%

Optimizer FILE SUMMARY

File Type	File Name
Project File	Ti-Force-Optimizer-Haas_MiniMill-01.voproject
Machine File	haas_minimill.xmch
Base Control File	hascnc.xctf
Tool Library File	Ti-bracket-no-holders-02-learned.tls
NC Program	CAM_Haas Machine Ti Part-model1_v1.mcd

TOOL LIST
Setup: 1

Operation:	Tool ID
	1
Tool Description	.75 DIA 4 FL 2-1/4LOC ROUGHING
Teeth	4
Cutter Diameter	0.75
Cutter Stick Out	2.5
Flute Length	2.25
Holders	
Max Spindle Speed	0
Max Feedrate	15
Max Depth	2.0543
Max Radial Width	0.2614
Optimized By	Force (725.1883)
Original Time	1:06:36
Optimized Time	0:34:58
Time Diff	48%
Errors	0

Training files

VO includes training sessions to help the user get up to speed with the software. These training files are located in the product under the Help Tab, Welcome screen.

The screenshot shows the software's Help menu with options: Welcome, On Optimizer, License, About Optimizer, and Check For Update. Below the menu is a 'Training' section with a list of optimization sessions:

- Session 351L-Air Cuts Only optimization
- Session 351M-Air Cuts Only optimization
- Session 352L-Analyze
- Session 352M-Analyze
- Session 353L-Learn From NC Program
- Session 353M-Learn From NC Program
- Session 353M-Learn From NC Program (C:\Program Files\CGTech\Optimizer\training\mill_session_353m_optimiz)
- Session 358L-Add NC Programs and define Work Offset
- Session 358M-Add NC Programs and define Work Offset
- Session 359L-Create a Tool Library

For more detailed information on any of the above subjects see the Optimizer Help (F1).