



Surfcam Verify, Plus & Predator Virtual CNC™

Feature grid by product license

Abstract

This paper outlines the specific features within SURFCAM Verify, Verify Plus and Predator Virtual CNC. SURFCAM Verify is included with every SURFCAM license and is also known as Verify Lite. Verify Plus and Predator Virtual CNC is licensed four ways: 2 Axis Lathe, 3 Axis Mill & Lathe, 4 Axis Mill & Lathe, 5 Axis Mill & Lathe.

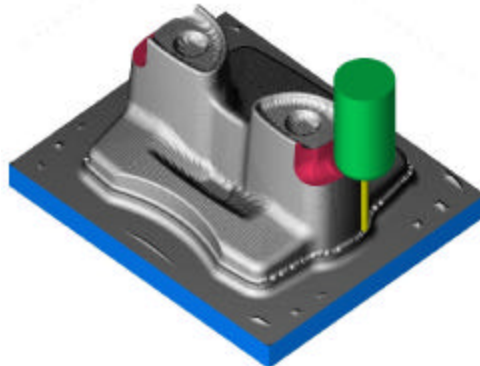
- SURFCAM Verify and Verify Plus is designed to verify toolpaths in an integrated environment within SURFCAM.
- Predator Virtual CNC is designed for CNC programmers to verify G-Code and simulate the manufacturing process prior to releasing any CNC programs or jobs to the shop floor.

Predator Virtual CNC is a member of a suite of Predator applications all designed to share common data and components. They all share a common design and philosophy based on our unique understanding of manufacturing processes.

This document is based on features in SURFCAM 2000.1 and Predator Virtual CNC v3.4.107

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10 Reasons to Upgrade to Verify Plus

- Integrated verification within SURFCAM
- Solids based verification for high end applications
- Turbo based verification that supports up to 10,000 blocks a second for 3 Axis Mold and Die applications
- Turbo based verification for turning applications
- ¾Turning Display
- CAD Compare
- Deep Zoom
- Translucent Stock and Fixtures
- Translucent Tool Display
- Fast Zoom, Pan, Fit and Rotate without reprocessing every block

40 Reasons to Upgrade to Predator Virtual CNC

- Stand alone application 100% focused on verification
- Supports INC, NCI and multiple APTCL input formats
- G and M code based verification with support for hundreds of CNC controls
- User configurable reverse post processor
- Parametric style programming with full custom macro B support including variables and expressions
- G and M code syntax checking
- G and M code best programming practices checking
- Linear and rotary axis travel limit checking
- Spindle checking
- Fixture and length compensation checking
- Diameter compensation checking with multiple block look ahead and support for tool edge and wear style programming
- Tool shank and holder collision detection
- Dog leg rapid collision detection
- Tool change collision detection
- Single error log with dynamic associativity with the Predator CNC Editor
- Multiple views and windows with simultaneous processing
- Change views, zoom, pan, fit, rotate, change light sources during and after cutting has begun
- Change models from animation to solid during and after cutting has begun
- Accurate inspection of the “cut” part with dynamic associativity with the Predator CNC Editor
- Solids based inspection with feature recognition
- Accurate cycle times based on extensive machine definitions
- Material removal calculations
- Turbo lathe model
- Export APTCL, CADL, and DXF files of the toolpath motion
- Create interactive HTML and JPEG based Setup Sheets
- 10 standard milling tool shapes

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- 10 standard lathe tool shapes
 - Custom tool, shank and holder shapes
 - Wireframe tool, shank and holder display
 - Precise tool stop control every tool crash, tool change, N blocks, optional stop, program stop, program change and any combination of the above
 - Interactive tool display speed that can be adjusted during the tool display
 - 6 line CNC program display with support for branching, looping, nested subroutines and sub program support
 - Multiple machine, operation and file based verification for production lines with automatic work in process stock transfer
 - Deep Zoom windows support fast Zoom, Pan, Fit and Rotate without reprocessing every block
 - V4.0 HTML based Online Help
 - V4.0 Backwards single step – rewinds N blocks and adds back the material
 - V4.0 Integrated 3D wireframe
 - V4.0 Integrated OpenGL support with enhanced lighting and rendering
 - V4.0 Export to shopfloor for dynamic viewing within Predator Desktop
 - Includes C-Hook for Mastercam v7 and v8
 - Upgrade to Predator Virtual Machine for integrated machine simulation

Features	SURFCAM Verify	SURFCAM Verify Plus	Predator Virtual CNC
Machining Processes			
2 Axis Turning	●	●	●
3 Axis Milling	●	●	●
Single Rotary Axis Indexing	●	●	●
4 Axis Simultaneous Milling	●	●	●
5 Axis Simultaneous Milling	●	●	●
Dual Rotary Axis Indexing	●	●	●
CNC Programming Styles			
Tool Tip and Tool Center Programming	●	●	●
Radius and Diameter Lathe Style Programming	●	●	●
Tool Motion Support			
Linear, Radius, Circular Interpolation	●	●	●
Spiral and Helical Interpolation	●	●	●
XY, YZ and XZ Cutting Planes	●	●	●
Absolute and Incremental Positioning	●	●	●
Inch and Metric Units	●	●	●
Hole Type Canned Cycles	●	●	●
Bolt Hole Circle Cycle			●
Square and Circle Pocket Cycles			●
OD and ID Turning Canned Cycles			●
G Code Support			
CNC Control Library with 150 pre-built controls			●
G0 or similar for Rapid Interpolation			●
G1 or similar for Linear Interpolation			●
G2 and G3 or similar for Circular Interpolation			●
G4 or similar for Dwells			●
G10 or similar for Fixture Offsets			●
NEW! G12/G13/G112/G113 or similar for Polar Interpolation			●
G17 or similar for XY Plane			●
G18 or similar for ZX Plane			●
G19 or similar for YZ Plane			●
G20 and G70 or similar for Inch Mode			●
G21 and G71 or similar for Metric Mode			●
G28 or similar for Return to Reference Point			●
G29 or similar for Return from Reference Point			●
G32 or similar for Threading - Turning			●
G40 or similar for Cutter Comp. Cancel			●
G41 or similar for Cutter Comp. Left			●
G42 or similar for Cutter Comp. Right			●
G43 or similar for Length Comp. Plus			●
G44 or similar for Length Comp. Minus			●
G45 or similar for Length Comp. Off Positive			●
G46 or similar for Length Comp. Off Negative			●

	Features	SURFCAM Verify	SURFCAM Verify Plus	Predator Virtual CNC
	G47 or similar for Length Comp. Off Positive Double			●
	G48 or similar for Length Comp. Off Negative Double			●
	G49 or similar for Length Comp. Cancel			●
NEW!	G50 and G51 or similar for Scaling			●
	G54 or similar for 1 st Work Offset			●
	G54.1 or similar for Set Work Offset			●
	G55 or similar for 2 nd Work Offset			●
	G56 or similar for 3 rd Work Offset			●
	G57 or similar for 4 th Work Offset			●
	G58 or similar for 5 th Work Offset			●
	G59 or similar for 6 th Work Offset			●
	G65 or similar for Macro Call			●
NEW!	G68 and G69 or similar for Rotation			●
NEW!	G70 or similar for Bolt Hole Circle			●
	G70 or similar for Finishing Cycle - Turning			●
	G71 or similar for Horizontal Roughing - Turning			●
	G72 or similar for Vertical Roughing - Turning			●
	G74 and G75 or similar for Lathe Tapping			●
	G76 or similar for Lathe Threading			●
	G80 or similar for Cancel Canned Cycle			●
	G73, G74 and G76 or similar for Hole Cycles			●
	G81 – G89 or similar for Hole Cycles			●
	G90 or similar for Absolute Positioning			●
	G91 or similar for Incremental Positioning			●
	G92 or similar for Set Absolute Zero			●
	G93 or similar for Inverse Time Feed Rates			●
	G94 or similar for Inverse per Minute Feed Rates			●
	G95 or similar for Inverse per Revolution Feed Rates			●
	G98 or similar for Return to Initial Plane			●
	G99 or similar for Return to Reference Plane			●
	M Code Support			
	M0 or similar for Program Stop			●
	M1 or similar for Optional Stop			●
	M2 and M30 or similar for Program End			●
	M3 and M4 or similar for Spindle CW or CCW			●
	M5 or similar for Spindle Stop			●
	M6 or similar for Tool Change			●
	M7 and M8 or similar for Coolant On			●
	M9 or similar for Coolant Off			●
	M30 or similar for Program End			●
	M36 or similar for Pallet Change			●
	M82 or similar for Clamp Off			●
	M86 or similar for Clamp On			●
	M87 or similar for Air Blast			●

	Features	SURFCAM Verify	SURFCAM Verify Plus	Predator Virtual CNC
	M98 or similar for Sub Program Call			●
	M99 or similar for Sub Program Return			●
	Custom Macro A & B Support			
	#1 - #33 or similar for Local Variables			●
	#100 - #199 or similar for Global Variables			●
	#500 - #531 or similar for Global Variables			●
	+ or similar for Addition			●
	- or similar for Subtraction			●
	* or similar for Multiplication			●
	/ or similar for Division			●
NEW!	EXP or similar for Exponent			●
NEW!	OR or similar for Logical sum			●
NEW!	AND or similar for Logical product			●
NEW!	XOR or similar for Exclusive OR			●
NEW!	EQ or similar for Equal			●
NEW!	NE or similar for Not Equal			●
NEW!	GT or similar for Greater Than			●
NEW!	LT or similar for Less Than			●
NEW!	GE or similar for Greater Than or Equal			●
NEW!	LE or similar for Less Than or Equal			●
NEW!	SIN or similar for Sine			●
NEW!	COS or similar for Cosine			●
NEW!	ACOS or similar for Arc Cosine			●
NEW!	TAN or similar for Tangent			●
NEW!	ATAN or similar for Arc Tangent			●
NEW!	SQRT or similar for Square Root			●
NEW!	ABS or similar for Absolute			●
NEW!	ROUND or similar for Round			●
NEW!	LM or similar for Logarithm			●
NEW!	IF or similar for Conditional Expression			●
NEW!	GOTO or similar for Branching			●
NEW!	WHILE or similar for Conditional Expression			●
NEW!	DO or similar for Starting a Loop			●
NEW!	END or similar for Ending a Loop			●
	Supported Machines Types			
	3 Axis Vertical Machining Center			●
	4 Axis Vertical Machining Center – 2 Subtypes			●
	5 Axis Vertical Machining Center – 3 Subtypes			●
	3 Axis Horizontal Machining Center – 2 Types			●
	4 Axis Horizontal Machining Center – 2 Types			●
	5 Axis Horizontal Machining Center – 3 Subtypes			●
	2 Axis Lathe - 2 types			●
	Mill/Turn - 2 types			●
	CNC Machine Library with 10 pre-built machines			●

	Features	SURFCAM Verify	SURFCAM Verify Plus	Predator Virtual CNC
	Verification Methods			
	Animation – Designed for the best Image Quality	●	●	●
	Solid Model – Designed for Virtual Inspection		●	●
	Turbo – Designed for 3 Axis Surface Milling		●	●
	Lathe Turbo – Designed for 2 Axis Turning			●
	Tooling			
	Wireframe Tool Display			●
	Solid Tool Display	●	●	●
	Translucent Tool Display		●	●
	Disable Tool Display	●	●	●
	Up to 1024 tools per Job	●	●	●
	Standard Milling Tool Shapes	8	8	10
	Custom Milling Tool Shapes			●
	Standard Turning Tool Shapes	5	5	10
	Custom Turning Tool Shapes			●
	Tool Shank and Tool Holder Shapes			●
	Tool Libraries with 1,100 pre-built tools	●	●	●
	Stock and Fixtures			
	Solid Stock Display	●	●	●
	Translucent Stock Display		●	●
	Up to 64 Stock and Fixture Shapes per Job			●
	Up to 13 Standard Stock and Fixture Shapes	●	●	●
	Custom Stock and Fixture Shapes via STL Files	●	●	●
	Stock and Fixture Library			●
	Collision and Error Detection			
	Tool Holder Collisions with Stock and Fixtures			●
	Tool Shank Collisions with Stock and Fixtures			●
	Rapid Motion Collisions with Stock and Fixtures	●	●	●
	Input			
	Unlimited File Size for every File Format	●	●	●
	APT/CL			●
	CNC Programs via 150 CNC Translators			●
	CNC Programs via 100 Configurable Reverse Posts			●
NEW!	Catia APTCL			●
	Custom Reverse Posts			●
	Custom Machines			●
	Mastercam NCI			●
NEW!	Pathtrace APTCL			●
	Predator RVP			●
	ProE APTCL			●
	Surfcam INC	●	●	●
	STL Files for Custom Stock Shapes	●	●	●
	STL Files for CAD Compare – Optional		●	●
NEW!	Unigraphics APTCL			●

	Features	SURFCAM Verify	SURFCAM Verify Plus	Predator Virtual CNC
	Output			
	APT/CL Files			●
	APT/ISO Files			●
	CADL Files			●
NEW!	DXF Files			●
NEW!	HTML based Setup Sheets			●
NEW!	JPEG Files			●
	Setup Sheets			●
	STL Files			●
	Window's Clipboard			●
	Visualization			
	Zoom In, Zoom Out and Zoom Window during or after cutting			●
	Deep Zoom		●	●
	Rotate Stock before cutting	●	●	●
	Zoom, Pan, Rotate Deep Zoom Window			●
	Pan, Fit, Rotate, 10 Standard Views			●
	Move and Rotate Light Source before cutting			●
	Move and Rotate Light Source after cutting			●
	%Section View - Turning		●	●
	JPEG based bitmap images per tool or CNC program			●
	Inspection and Analysis			
	Cycle Time			●
	Cut Sections			●
	Standard and Feature Based Inspection			●
	Material Removed			●
	CAD Compare		●	●
	General System			
	VCR Style Operation Buttons	●	●	●
	Option to Index Part or Change Origins at anytime			●
	Online Help	●	●	●
	Enable and Disable Toolbars			●
	Enable and Disable Status Bar			●
	Upgrade to Higher Level of Software	●	●	●

NOTE: It is not possible to list every individual feature contained within SURFCAM Verify, Verify Plus and Predator Virtual CNC. The intent of the above table is to determine overall capabilities and the functionality within each product.

For More Information

For the latest information on Predator Virtual CNC, check our web site at <http://www.predator-software.com>

For the latest information on SURFCAM Verify and Verify Plus, check Surfware's web site at <http://www.surfware.com>