AUTODESK

Why ModuleWorks? Why now?

Craig Chester Product Manager – Fusion Manufacturing

Agenda

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3

4

What is Fusion 360?

2 Cloud based collaboration

Integrating manufacturing technology

Why ModuleWorks, why now?



What is Fusion 360?



Integrated

Collaborative

Accessible





This presentation will focus on the Milling workspace of Fusion 360



Cloud-based collaboration

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Collaborative

- Communicate faster
- With designers, engineers, and machine operators





Integrating technology

Manufacturing Workspace

Integration of industry leading manufacturing technology





OK... So why ModuleWorks ? Why now?

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02-24-2022, 07:13 PM	#1
gregormarwick O Diamond	Join Date: Feb 200 Location: Aberdeen, L Posts: 4,93 Post Thanks / Like Likes (Given): 1833 Likes (Received): 2480

My point was that the Delcam kernel was/is one of very few actual real competitors to MW that has feature parity with it, and probably exceeds MW in some areas.

AD have spent the last half a dozen years pillaging that for their own purposes. What do they need MW for?

I can't figure out the answer to that question, unless the answer is simply to monopolise the market - and AD certainly have form with that kind of shit.

WHY work with ModuleWorks?



WHY work with ModuleWorks?



Let's step back a few years





Times are changing....

A selection of PowerMill technology recently integrated into Fusion 360

Automated Flat machining

4 axis automatic collision avoidance





5 Axis functionality for all appropriate 3D Fusion milling strategies (Insider Preview)



Optimized parallel passes



Steep and shallow Automatically avoid flats

Strategic Manufacturing Partnerships



Fusion 360 Milling

Near term goal



AUTODESK[®] FUSION 360° **AUTODESK**[®] **FEATURECAM**[®] Technology **AUTODESK**° **POWERMILL**[®] Technology



WHY ModuleWorks?



AUTODESK[®] FUSION 360° **AUTODESK**[®] **FEATURECAM**[®] Technology **AUTODESK**[®] **POWERMILL**[®] Technology **AUTODESK**° **POWERINSPECT**[®] Technology **ModuleWorks**



ModuleWorks

So, what ModuleWorks technology have we licensed and why?

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4 Axis – Cylindrical and Conical Roughing



Roughing

Bull Nose D12 R2 ETM-4120-20 Feedrate = 8500 mm/min a_p = 0.5 mm Calculation strategies: • Rotary machining Y Axis Offset to cut on the leading edge of the tool



No 'Seam' like we have with WRAP

Minimizes the number of rotary axis reversals

4 Axis – Cylindrical and Conical Finishing





TEXT COMMANDS

ModuleWorks

Consistency in look and feel

eeds Surface paths Part de	finition Link	Clearance			
Calculation based on	Rotary machin	ning 🗸			
Operation					
Machining	Roughing		~		
Slices pattern	Radius con	istant	~		
Tune	Offeet		~		
Type	onset				
Axis offset					
Offset value	0 2.5	Tool diamete	r %		
Sorting					
Cutting method	Zigzag		~		
Direction for closed suite	Climb		~		
Machine by	Regions		~		
Depth steps		Stepover			
Constant depth-step	~	Maximum stepover	3		
Distance	5				
Additional cutr on floorr					
		Smoothing			
		Corners %	20		
Advanced		Final contour %	10		
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ModuleWorks

Fusion Adap	otive
ADAPTIVE : ADAPTIVE1	*

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8 8 8 5	3	
▼ Passes		
Tolerance	0.1 mm	
Machine Shallow Areas	•	
Optimal Load	2.4 mm	
Both Ways	0	
Minimum Cutting Radius	0.6 mm	
Machine Cavities		
Use Slot Clearing	0	
Direction	Climb •	
Maximum Roughing Ste	15 mm	
Fine Stepdown	1.5 mm	
Flat Area Detection		
Minimum Stepdown	0.0001 mm	
Minimum Axial Engager	0 mm	
Order by Depth	•	
Order By Area	0	
▼ 🖉 Stock to Leave		
Radial Stock to Leave	0.5 mm	
Axial Stock to Leave	0.5 mm	
▼ Ø Fillets		
OK Cancel		

Fusion 4-Axis

	I • 4-AXIS ROUGHING : 4-/	AXIS ROUGHING6				
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	▼ Passes					
	Tolerance	0.1 mm				
	Stepover	3 mm				
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	Maximum Stepdown	0.6 mm				
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1	▼ Rotary Passes					
	Style	Offset •				
	Tool Offset	0 mm				
	▼ 🖉 Variable Stepdown					
-	Minimum Axial Engager	0 mm				
	▼ 🖉 Stock to Leave					
	Stock to Leave	0.5 mm				
	▼ 🖉 Fillets					
1	Fillet Radius	1.5 mm				
	Final Fillet Radius	1.5 mm				
	▼ 🖉 Smoothing					
	Maximum Point Spacing	0.5 mm				
	0	K Cancel				

P Fusion Rotary

I CROTARY : ROTARY3		
8 🗗 🚳 🗏 🔽	-	
▼ Passes		
Tolerance	0.01 mm	
Stepover	3 mm	
Direction	Both ways 🔻	
▼ Rotary Passes		
Style	Spiral 🔹	
Tool Offset	0 mm	
▼ Ø Stock to Leave		
Radial Stock to Leave	0.1 mm	
Axial Stock to Leave	0.1 mm	
▼ 🖉 Smoothing		
Maximum Point Spacing	0.5 mm	
▼ 🖉 Feed Optimization		
Maximum Directional Ch	25 deg	
Reduced Feed Radius	0.3 mm	
6 0	K Cancel	

3,4 and 5 Axis – Automated Deburring







3 Axis with Chamfer Tool or 5 Axis with End Mill



5 Axis Automatic Collision Avoidance with Iollipop tool

Multiple Cuts

Deburr Strategy







4 Axis Roughing







Automatic Deburring



Geodesic





Multi-Axis Machining (Includes simultaneous 5 axis roughing plus Circle Segment Tool support for finishing operations)



Questions?

Craig.chester@autodesk.com