Cycle time reduction and programming for CNC milling

CAPSmill™

CAPSmill reduces cycle times and programming time. It enables you to take on complex jobs confidently. First-time-right programs and 100% accurate cycle time calculations are guaranteed. Makes your business competitive and profitable.

What you can do with CAPSmill

Reduce machining cycle time.
Reduce programming time.
Reduce first part rejection.
Reduce dependence on skilled CNC programmers.
Reduce time taken to respond to job quotations.
Reduce risk of over or underestimating cycle times.

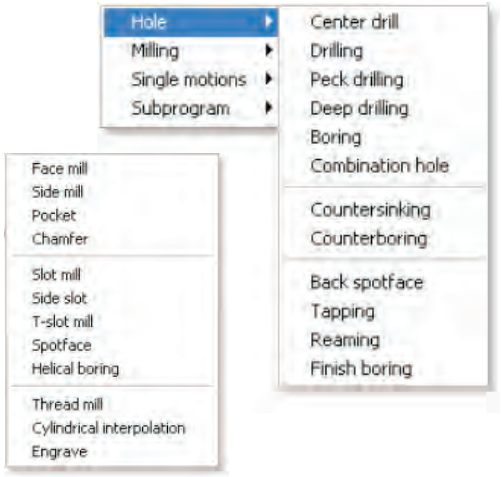
Increased confidence. Increased competitiveness. Increased profits.

CAPSmill features, and how they help

Reduce cycle time

Auto FS selection eliminates a big cause of high cycle times – poor cutting parameters selection. Parameters are automatically selected from a fully user-configurable database, based on the workpiece material, tool material and tool type.

Operations with unique and efficient tool paths reduce cutting and air cut times.



Cycle time calculation is extremely accurate, with less than 1 % error. Enables you to try out many process options in minutes, decide on the one with least cycle time.

Automatic tool gouge prevention ensures that a tool removes only whatever material it can, and does not gouge into the part. You can use roughing tools to the maximum, with higher cutting feeds and depths of cut.

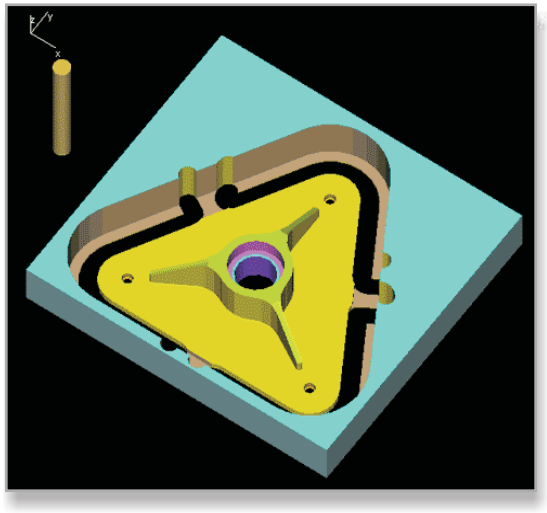
Spindle power graph shows you the power used in each operation. Enables you to use the spindle to the maximum, without overloading it.

Automatic shortest path selection reduces air cut time during tool approach to and departures from operations.

Reduce part rejections

Automatic tool gouge prevention ensures that a tool does not gouge into the part even if its geometry does not allow it to enter a particular contour.

Tool path simulation is highly effective, shows any possible problems, eliminates rejections and accidents.



Reduce machine downtime

Automatic safe tool path and gouge prevention eliminate the need for single-block check and dry run at the machine.

NC programs are generated first-time right, do not require any editing at the machine.

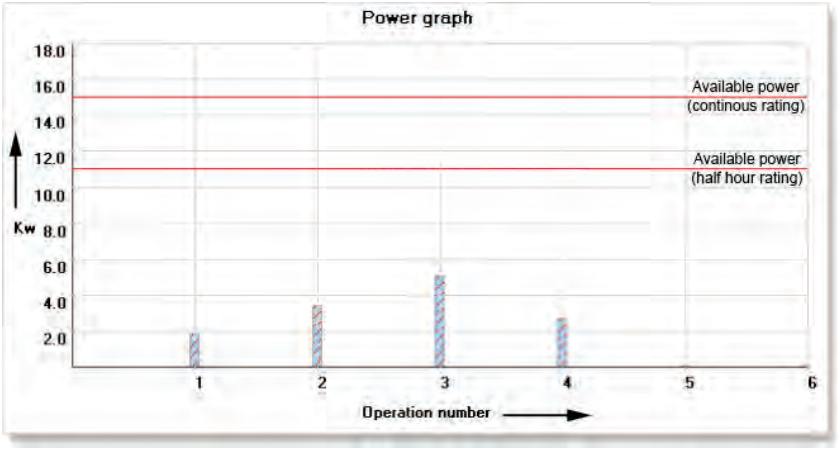
Inbuilt DNC transfers the NC program to the machine in seconds, cuts time for program entry at the machine.

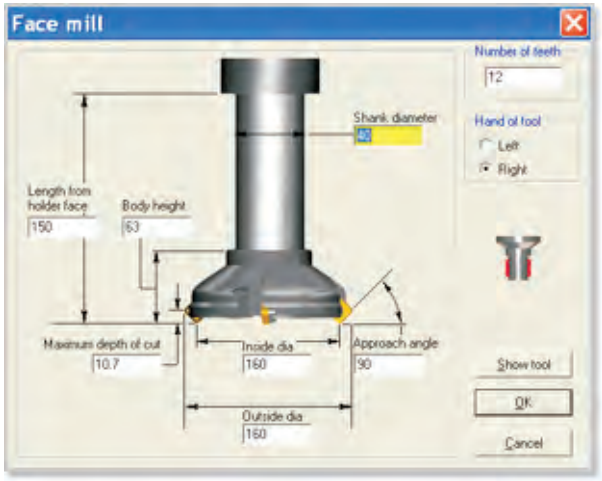
Cycle time sheet

Machine name	Heidenhain TNC355	**Work piece material**	Steels, free-cutting, TS 400-700 N/mm2
Part number	05DFE000065	Fixture	FXT FE000065
Part name	ENGMOUNTING BRKT	Programmer	CADEM
Date	29 April 2010	Set up number	1

Sl. no.	Operation name	Tool name	Tool no.	Cutting speed		Feed rate		Cut length	Cutting time	TC time	Rapid time	Total time
				RPM	mm/m	mm/r	mm	min	min	min	min	min
1	Face mill	100.00 mm. dia. Face mill	4	220.00	630	617.40	0.98	727.00	1.18	0.13	0.04	1.35
2	Face mill	100.00 mm. dia. Face mill	4	220.00	630	617.40	0.98	966.48	1.76	0.00	0.03	1.78
3	Side slot mill Rough & finish	4.50 mm. dia. T-slot mill	5	40.00	160	192.00	1.20	654.85	3.41	0.13	0.04	3.58
4	Center drilling	3.15 mm. dia. Center drill	6	35.00	3700	555.00	0.15	4.95	0.01	0.13	0.03	0.17
5	Center drilling	3.15 mm. dia. Center drill	6	35.00	3700	555.00	0.15	39.57	0.07	0.00	0.08	0.15
6	Drill	5.00 mm. dia. Twist drill	7	50.00	3150	189.00	0.06	22.50	0.12	0.13	0.03	0.28
7	Drill	5.00 mm. dia. Twist drill	7	50.00	3150	189.00	0.06	100.02	0.53	0.00	0.09	0.62
8	Countersink	3.20-16.00 mm. CSK 120 deg.	9	60.00	1250	150.00	0.12	4.39	0.03	0.13	0.03	0.19
9	Countersink	3.20-16.00 mm. CSK 120 deg.	9	60.00	1250	150.00	0.12	35.08	0.25	0.00	0.08	0.33
10	Tap	M6.00 x 1.00 Tap	8	7.00	400	400.00	1.00	40.00	0.12	0.13	0.03	0.28
11	Tap	M6.00 x 1.00 Tap	8	7.00	400	400.00	1.00	320.00	0.93	0.00	0.07	1.00

Summary	
Total cutting time	8.41 min
Total tool change time	0.80 min
Total rapid motion time	0.54 min
Total miscellaneous time	0.75 min
Total cycle time	10.49 min

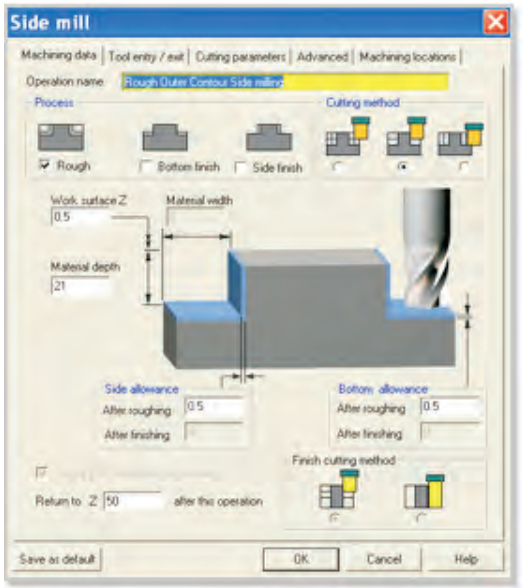




Eliminate accidents and rejections

Manual errors caused by misunderstanding programs is eliminated, and hence the resultant accidents and rejections. NC programs are automatically documented, with details like part number, operation names and tool numbers inserted as comments. No program reading skill is required to understand what each section of the program does.

Advanced tool nose radius compensation ensures good quality parts even for very complex geometries, with no rejections caused by contour inaccuracies.



Automatic safe path logic eliminates collisions during tool approach to and departure from the part. The path can be further fine tuned by the user.

Efficient programs, interchangeable between machines

Compact programs with canned cycles and subprograms output for repetitive operations.

Support for all popular CNC controls – Fanuc, Sinumerik, Haas, Fagor, etc.

Generic postprocessor allows you to configure NC programs to the format that you are comfortable with.

Interchangeability in seconds. If a part planned for a particular machine has to be loaded on another one at the last minute, the program for the new machine can be generated in seconds.

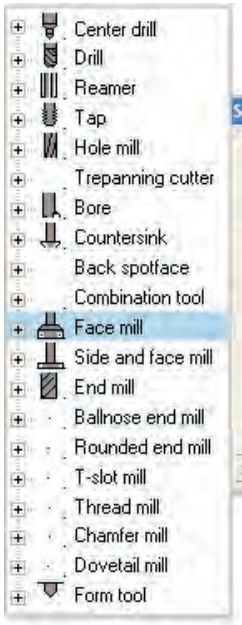
Reduce skill level of programmers

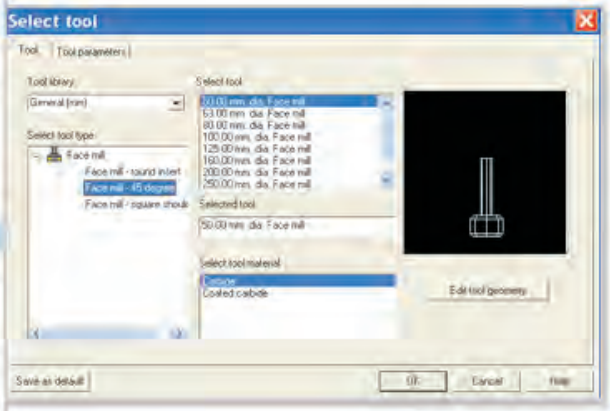
Conversational screens reduce programmer's skill requirement. No CNC programming knowledge needed. An operator with machining knowledge can do the programming. Training time is less than 2 hours. Animated input screens make it difficult to make mistakes.

Automatic cutting parameters selection eliminates knowledge required to select parameters. No more thumb rules to select feeds / speeds.

Tool selection guidance and default selection from extensive tools database reduce the requirement of tooling knowledge. Software suggests the right type of tool and narrows the selection.

Automatic tool gouge prevention ensures that a tool only removes whatever material it can, does not gouge into the part even if a wrong tool has been selected.





FANUC

HEIDENHAIN

FAGOR

HAAS HURCO

num

SIEMENS

OKUMA

MITSUBISHI ELECTRIC

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%
O1234 (COVER PLATE FG-66439)
(22-04-2010)
N1 T4 (100.00 MM. DIA. FACE MILL)
M98 P9999
T5
(FACE MILL LEFT)
S700 M3
G90 G00 G54 X84.639 Y128.935 M8
G43 H4 Z100.
Z6.
G01 Z1. F480
M98 P00010055
G90 G00 X144.639 Y188.935
Z2.
X84.639 Y128.935
G01 Z0. F480
M98 P00010055
G90 G00 X144.639 Y188.935
Z50.
(FACE MILL RIGHT)
X70.475 Y103.935
Z1.
G01 Z-4. F480
M98 P00010056
G90 G00 X204.639 Y103.935
Z-3.
X70.475
G01 Z-5. F480
M98 P00010056
G90 G00 X204.639 Y103.935
Z50.
M5
M9
Z100.
M01
N2  (4.50 MM. DIA. T-SLOT MILL)
M98 P9999
T6
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Reduce programming time

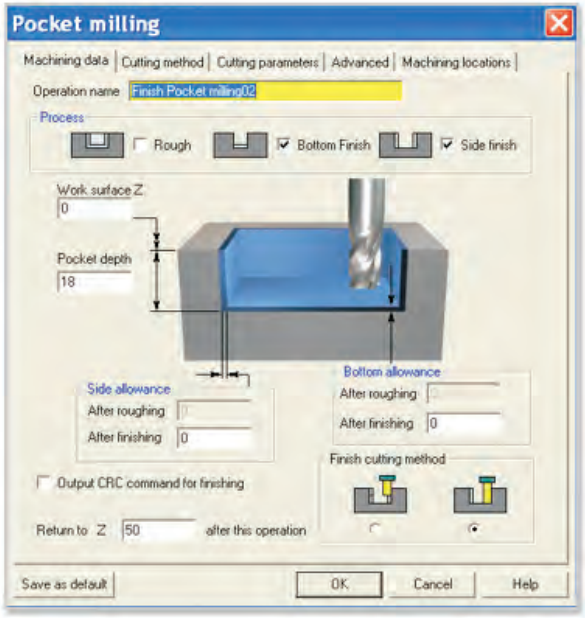
Automatic raw material updation, tool selection guidance and conversational screens reduce programming time dramatically.

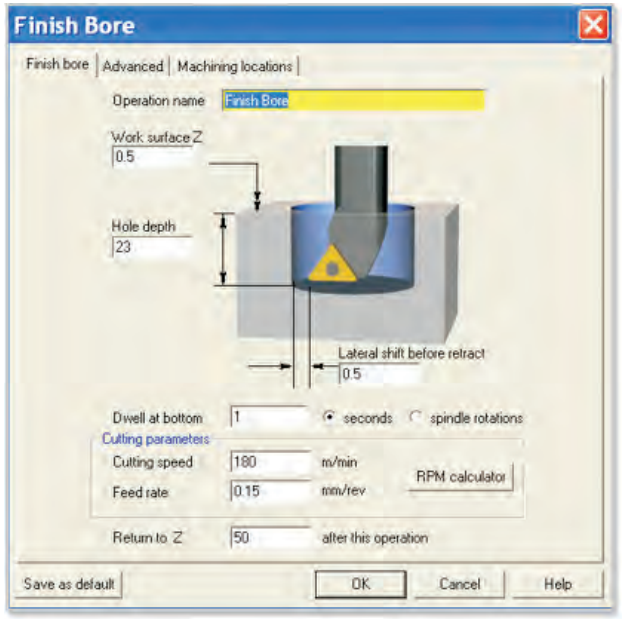
Advanced CAD with special part-definition features reduces the time to define the part and blank.

Part and blank shapes can be imported from external CAD drawings, as DXF or IGES files.

Improve systems, reduce dependence on people

Automatic shop floor documentation generates printable documents that can be filed away for reference – process sheet, tools list, tool layout sheet. Eliminates errors in information flow to shop floor. Respond to your customer enquiries within 30 minutes of receiving the part drawing, with an accurate quote that you are confident about.





Making money, or just chips ?™

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