



# Cycle time reduction and programming for CAPSturn

CAPSturn 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 CAPSturn

# CAPSturn™

- 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.

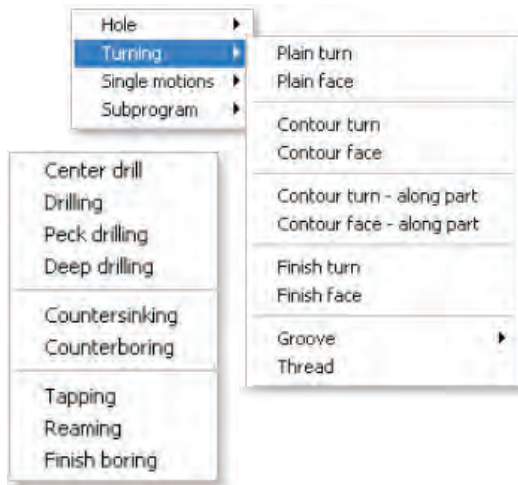
**Increased confidence. Increased competitiveness. Increased profits.**

## CAPSturn 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.

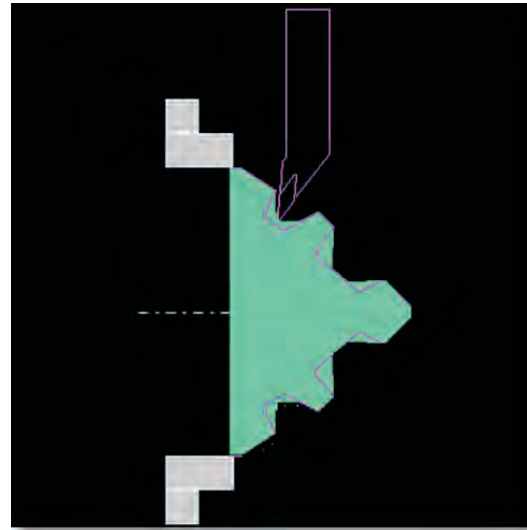
**Spindle power graph** shows you the power used in each operation. Enables you to use the spindle to the maximum, without overloading it.

**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.

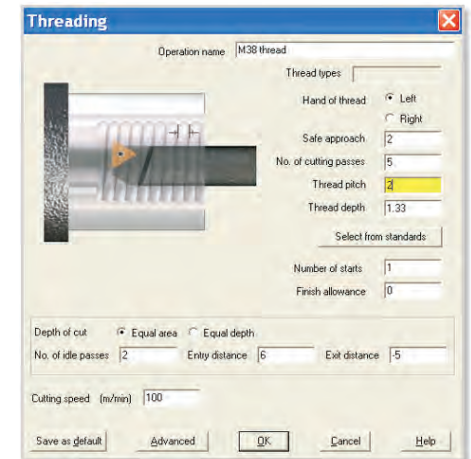
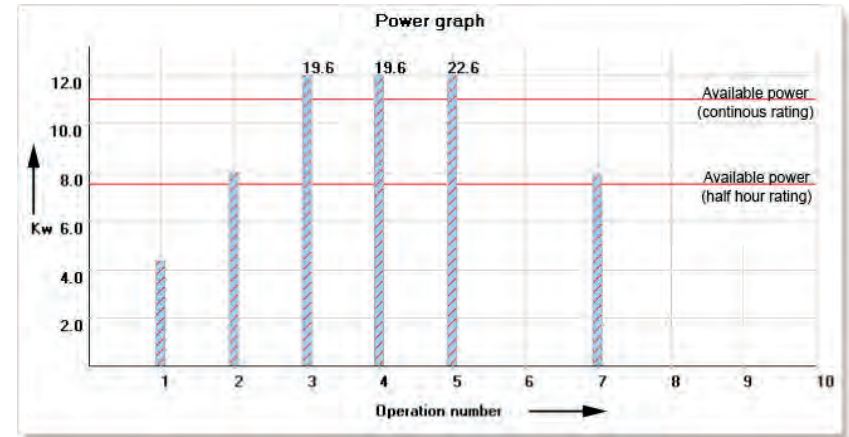
**Inbuilt DNC** transfers the NC program to the machine in seconds, cuts time for program entry at the machine.

### Cycle time sheet

|              |                |                     |  |
|--------------|----------------|---------------------|--|
| Machine name | DMG CTX        | Work piece material | Stainless steel, austenitic and duplex |
| Part number  | 1298TYR        | Fixture             | Chuck                                  |
| Part name    | LHDRIVE HUB 12 | Programmer          | CADEM                                  |
| Date         | 29 April 2010  | Set up number       | 1                                      |

| Sl. no. | Operation name            | Tool name          | Tool no. | Cutting speed |     | Feed rate |        | Cut length (mm) | Cutting time (min) | TC (min) | Rapid time (min) | Total time (min) |
|---------|---------------------------|--------------------|----------|---------------|-----|-----------|--------|-----------------|--------------------|----------|------------------|------------------|
|         |                           |                    |          | m/min         | RPM | mm/min    | mm/rev |                 |                    |          |                  |                  |
| 1       | Plain face                | PCLNL 2525M12 R0.8 | 1        | 200.00        | CSS | 0.00      | 0.25   | 32.00           | 0.07               | 0.02     | 0.02             | 0.11             |
| 2       | Plain face                | PCLNL 2525M12 R0.8 | 1        | 200.00        | CSS | 0.00      | 0.25   | 13.32           | 0.05               | 0.00     | 0.02             | 0.07             |
| 3       | Plain turn                | PCLNL 2525M12 R0.8 | 1        | 200.00        | CSS | 0.00      | 0.25   | 4.60            | 0.02               | 0.00     | 0.00             | 0.02             |
| 4       | Plain face                | PCLNL 2525M12 R0.8 | 1        | 200.00        | CSS | 0.00      | 0.25   | 17.78           | 0.10               | 0.00     | 0.01             | 0.11             |
| 5       | Contour turn              | PCLNL 2525M12 R0.8 | 1        | 200.00        | CSS | 0.00      | 0.25   | 21.00           | 0.13               | 0.00     | 0.00             | 0.14             |
| 6       | Plain turn                | PCLNL 2525M12 R0.8 | 1        | 200.00        | CSS | 0.00      | 0.25   | 29.93           | 0.10               | 0.00     | 0.01             | 0.11             |
| 7       | Plain face                | SVJBL 2525K16 R0.4 | 2        | 200.00        | CSS | 0.00      | 0.18   | 20.27           | 0.07               | 0.02     | 0.02             | 0.10             |
| 8       | Contour turn - along part | SVJBL 2525K16 R0.4 | 2        | 200.00        | CSS | 0.00      | 0.18   | 30.50           | 0.16               | 0.00     | 0.01             | 0.16             |

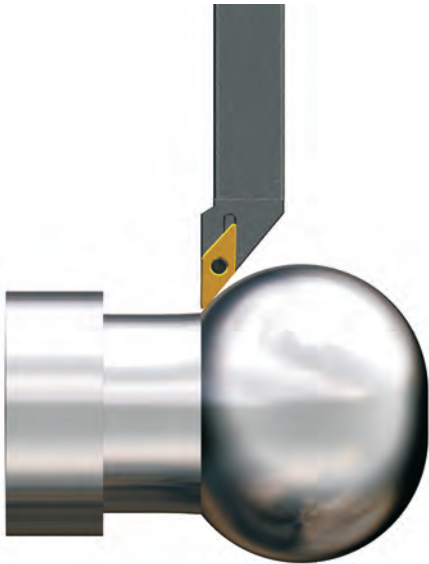
| Summary                  |          |
|--------------------------|----------|
| Total cutting time       | 3.53 min |
| Total tool change time   | 0.08 min |
| Total rapid motion time  | 0.19 min |
| Total miscellaneous time | 0.32 min |
| Total cycle time         | 4.13 min |



## ■ 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 quality 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.

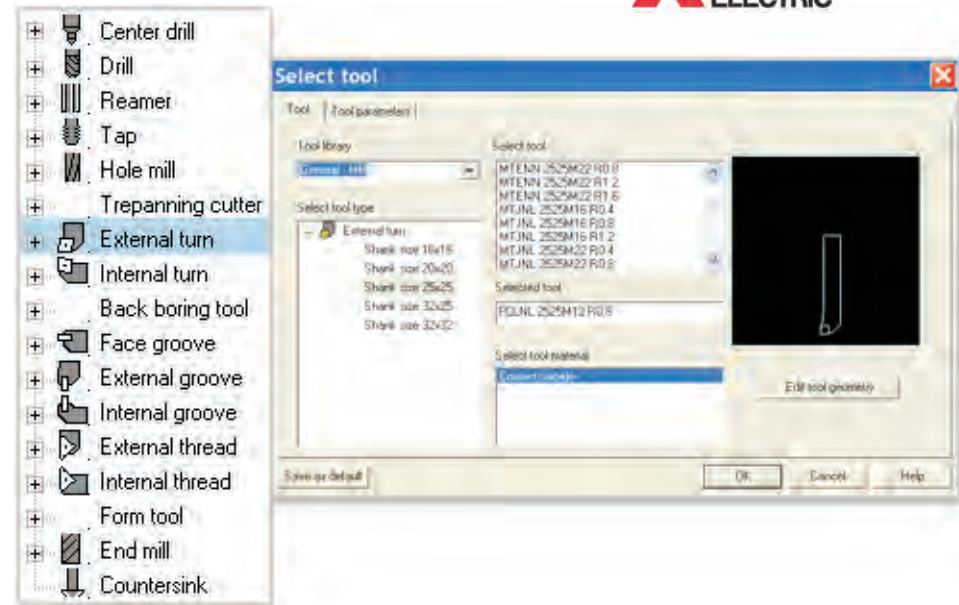
## ■ Reduce skill level of programmers

**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



HURCO

NUM

SIEMENS



MITSUBISHI ELECTRIC

```
%
O6621 (SHAFT TF-13872)
( DATE 22-04-2010)
G21 G95
G0 X300. Z100.
N1 T0101 (PCLNL 2525M12 R0.8)
G50 S3000
G96 S200 M04
(ROUGH FACE)
X114. Z7. M08
G72 W3. R0.5
G72 P25 Q40 U0. W0.5 F0.358
N25 G0 Z0.
N30 G01 X110. Z0.
N35 X-3.
N40 Z5.
G0 X114.
(ROUGH TURN)
Z2.5
G97 S795
G71 U3. R0.5
G71 P45 Q130 U1. W0.2 F0.358
N45 G00 X49.2
N50 G01 X49.2 Z0.5
N55 Z0.
N60 X57.15 Z-15.5
N65 Z-37.7
N70 X73.03
N75 Z-59.92
N80 Z-66.104
N85 Z-88.374
N90 Z-94.558
N95 Z-105.873
N100 Z-107.873
N105 Z-123.422
N110 Z-125.422
N115 X104. Z-138.2
N120 Z-178.2
N125 X110.
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## Reduce programming time

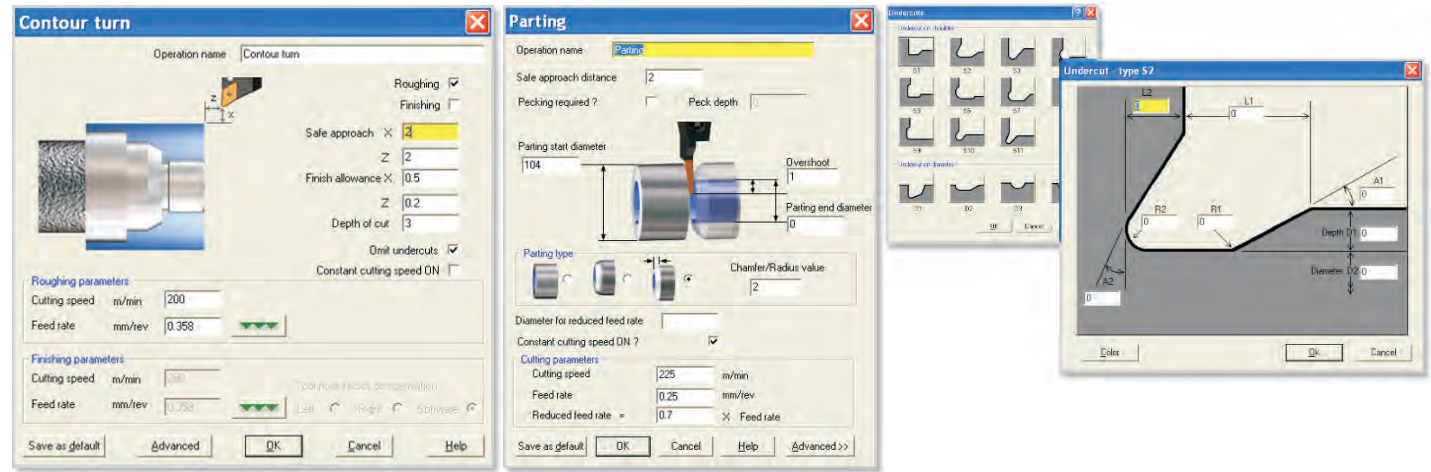
**Automatic raw material updation**, tool selection guidance and conversational screens reduce programming time dramatically.

**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.



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Making money,  
or just chips?™

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