

Subject: CNC Lathe	Product: A1000 and G7 Drives	Doc#: AO.AFD.57
Title: CNC Lathes		

## CNC Lathes

### Application Overview

A CNC lathe is a machine tool designed to remove material from a rotating work piece, using a cutting tool. Some lathes can form hollow parts by a process called metal spinning. These parts have circular cross-sections. Metal and other materials can be turned on a lathe, including wood and plastics. CNC controlled lathes use a computer to control the process of making each part with repeated accuracy and precision.

### Application Challenges:

- Precise speed regulation and torque over wide speed range
- Interlock drive with operation of CNC
- Quick acceleration even under high torque conditions

### Yaskawa Products:

Product	Feature	Benefit
<b>A1000 or G7 Drives</b>	High inertia variable frequency control – 60 to 180 Hz	With the drive's ability to operate above motor base speed, between 60Hz and 180Hz, belt or gear drives are no longer needed when working with large or small diameter cutters.
	Precise speed regulation over wide speed range	The drive is capable of running the application across a wide range of speeds, from a slow heavy cutting to a fast lightweight cutting.
	Field Weakening Control and Energy Saving Control	Both the Field Weakening Control and the Energy Saving Control Function can greatly increase motor precision when working with lighter materials.
	BCD/Binary Digital Input	An interlock with a computer numerical control (CNC) is possible by using a binary or BCD digital option card.
	Frequency Detection	The drive is capable of using Frequency Detection to achieve complete interlock with the CNC.
	Overtorque Detection	A worn cutting tool can be detected immediately with Overtorque Detection.
	Stall Prevention During Accel	Quick acceleration is possible by using the Intelligent Stall Prevention during acceleration function.

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**Application Details:**

A metal lathe usually spins the work piece along a horizontal axis. A mandrel or chuck is mounted to the headstock of the lathe. A follower block or tail block is mounted to the tailstock. A blank piece is clamped to the lathe and pressure is applied to the blank via a cutting tool. Material is cut away on each pass across the blank. After each pass, the lever arm is moved closer to the final position. Eventually, when the proper amount of material has been removed, the part is completed.

Yaskawa AC drives can be interlocked with the CNC control systems so the operation of the CNC controller and the AC drive are synchronized.

In addition, the Energy Saving Mode in Yaskawa AC drives automatically detect changes to the amount of torque required during shaping and finishing phases. This feedback enables the drive to quickly detect changes as the cutting tool becomes dull.

