

Department of Mechanical Engineering

Makerspace Safe Operating Procedure

Haas Desktop Mill

CAUTION: Only authorized and trained personnel may operate this equipment. You must always act in accordance with the Operator's manual, safety decals, safety procedures, and instructions for safe machine operation. Untrained personnel present a hazard to themselves and the machine.

IMPORTANT: Do not operate this machine until you have read all warnings, cautions, and instructions

CAUTION: All CNC machines present hazards from rotating cutting tools, belts and pulleys, high voltage electricity, noise, and compressed air. When you use CNC machines and their components, you must always follow basic safety precautions to reduce the risk of personal injury and mechanical damage. The work area must be adequately illuminated to allow clear view and safe operation of the machine. This includes the operator work area and all areas of the machine that might be accessed during maintenance or cleaning. Adequate lighting is the responsibility of the user. Cutting tools, work holding, workpiece and coolant are beyond the scope and control of Haas Automation, Inc. Each of these potential hazards associated with it (sharp edges, heavy lifting considerations, chemical composition, etc.) and it is the responsibility of the user to take appropriate action (PPE, training, etc.). Cleaning of the machine is required during normal use and prior to maintenance or repair. Optional equipment is available to aid cleaning such as washdown hoses, chip conveyors and chip augers. Safe use of this equipment requires training and might require appropriate PPE and is the responsibility of the user. This operator's manual is intended as a reference guide and is not to be the sole source of training. Complete operator training is available from the authorized Haas distributor.

Summary of Types of Operation for Haas Automation Machine Tools

Haas CNC Mills are intended for cutting and shaping of metals and other hard materials. They are general purpose in nature and a list of all of those materials and types of cutting would never be complete. Almost all cutting and shaping is performed by a rotating tool mounted in a spindle. Rotation of the mill is not required. Some cutting operations require liquid coolant. That coolant is also an option depending on the type of cutting.

Operations of Haas Mills are separated into three areas. They are: Operations, Maintenance, and Service. Operations and Maintenance are intended to be performed by a trained and qualified machine operator. This Operator's Manual contains some of the information necessary to operate the machine. All other machine operations are to be considered Service. Service is only to be performed by specially trained service personnel.

Operation of this machine consists of the following:

1. Machine Setup o Machine setup is done to initially set up the tools, offsets, and fixtures required to perform a repetitive function that later is called machine operation. Some machine setup functions can be done with the door open but are limited to "hold to run".
2. Machine operating in Automatic Mode: Automatic operation is initiated with Cycle-Start and can only be done with the doors closed.
3. Operator loading and unloading of materials (parts). Parts loading and unloading is what precedes and follows an automatic operation. This must be done with the doors open and all machine automatic motion is stopped when the door is open.
4. Operator loading and unloading of cutting tools: Tool loading and unloading is done less often than setup. It is often required when a tool has become worn and must be replaced.

Maintenance only consists of the following:

1. Adding and maintaining condition of coolant: Adding coolant and maintaining coolant concentration is required at regular intervals. This is a normal operator function and is either done from a safe location outside of the work enclosure or with the doors open and the machine stopped.
2. Adding lubricants: Adding lubricants for spindles and axes is required at regular intervals. These are often months or years in length. This is a normal operator function and is always done from a safe location outside of the work enclosure.
3. Cleaning chips out of the machine: Cleaning out of chips is required at intervals dictated by the type of machining performed. This is a normal operator function. It is performed with the doors open and all machine operation is stopped.

DANGER: Do not enter the machining area any time the machine is in motion, or at any time that machine motion is possible. Severe injury or death may result. Motion is possible when the power is on and the machine is not in [EMERGENCY STOP].

Basic safety:

This machine can cause severe bodily injury. This machine is automatically controlled and may start at any time. It is the machine owner's responsibility to make sure that everyone who is involved in installing and operating the machine is fully acquainted with the operation and safety instructions provided with the machine **BEFORE** they work with the machine. The ultimate responsibility for safety rests with the machine owner and the individuals who work with the machine. Use appropriate eye and ear protection when you operate the machine. Use appropriate gloves to remove processed material and to clean the machine. Replace windows immediately if they are damaged or severely scratched. Keep the side windows locked during operation (if available).

Operation Safety:

DANGER: To avoid injury verify that the spindle has stopped turning before opening the doors. In the event of a loss of power the spindle will take much longer to coast to a stop. Do not operate the machine unless the doors are closed and the door interlocks are functioning correctly. Check for damaged parts and tools before you operate the machine. Any part or tool that is damaged should be properly repaired or replaced by authorized personnel. Do not operate the machine if any component does not appear to be functioning correctly. Rotating cutting tools can cause severe injury. When a program runs, the mill table and spindle head can move rapidly at any time.

Improperly clamped parts machined at high speeds/feeds may be ejected and puncture the enclosure. It is not safe to machine oversized or marginally clamped parts.

CAUTION: Manual or Automatic closing of the enclosure doors is a potential pinch point. With Auto Door, the door may be programmed to close automatically, or by pressing the door open/close button on the operator's pendant. Avoid putting hands or appendages in the door while closing either manually or automatically.

Follow these guidelines when you work with the machine:

Normal operation - Keep the door closed and guards in place (for non-enclosed machines) while the machine operates. Part loading and unloading – An operator opens the door, completes the task, closes the door, and then presses [CYCLE START] (starting automatic motion). Machining job set-up – When set-up is complete, turn the set-up key to lock out set-mode and remove the key. Maintenance/Machine Cleaner– Press [EMERGENCY STOP] or [POWER OFF] on the machine before you enter the enclosure.

Periodic inspection of machine safety features:

Inspect door interlock mechanism for proper fit and function. Inspect safety windows and enclosure for damage or leaks. Verify all enclosure panels are in place.

Door Safety Interlock inspection:

Inspect the door interlock, verify the door interlock key is not bent, misaligned, and that all fasteners are installed. Inspect the door interlock itself for any signs of obstruction or misalignment. Immediately replace any components of the Door Safety Interlock system that do not meet this requirement. With the machine in run mode, close the machine door, run the spindle at 100 RPM, pull the door and verify the door does not open.

Potential Hazards

Impact, Pinch and Crush Points	Failure or Malfunction
Entanglement and Entrapment	Control Errors
Manual Handling	Dusts and Fumes
Electrical Components	Eye Injury

By signing this document, I, _____, agree to abide by I agree to use makerspace responsibly in accordance with the rules, policies, and guidelines in this document.

MEDDL User

Date

MEDDL Makerspace

Date