SAFETY FOR METAL CUTTING 101

Class Vocabulary

Term	Definition
Air Nozzle	A device used to spray air. Air nozzles can be used by an operator to remove chips from inside a CNC machine.
Bore	A single-point cutting tool used to enlarge a preexisting hole. Boring, which can be performed on either a lathe or a mill, helps create a concentric hole that meets tight tolerances.
Carriage	The section of the lathe that slides back and forth longitudinally along the ways. The carriage supports the cross-slide and cutting tool.
Chip	An unwanted piece of metal that is removed from a workpiece. Chips are formed when a tool cuts or grinds metal.
Chip Auger	A rotating shaft with a helical blade that removes chips from the machine. The chips auger's automated removal of chips from the point of operation reduces the risk of injury because operators do not need to remove the chips by hand.
Chip Guard	A plastic shield that covers the point of operation. A chip guard prevents flying chips from contacting the operator.
Chuck	A device that holds a workpiece in place as it rotates on a lathe or other machine. The chuck commonly has two, three, or four jaws that can be adjusted to fit various workpieces.
Chuck Key	A device used to loosen or tighten a chuck. A chuck key must be removed from the chuck before starting a machine.
Clamps	A workholding device that grips and holds a workpiece in place. Clamps can be used when machining with a mill.
CNC Machine	Computer Numerical Control machine. A machine tool controlled by a computer running programs driven by numerical data. Most CNC machines are enclosed.
Computer Numerical Control Machines	CNC machine. A machine tool controlled by a computer running programs driven by numerical data. Most CNC machines are enclosed.
Conveyor Belt	A moveable belt used in industry to transport materials over a distance. For metal cutting safety purposes, conveyor belts help remove sharp chips from a machine

	tool.
Coolant	A cutting fluid used to decrease the temperature of the tool and the workpiece. Coolant can contain oil, water, or synthetics.
Cutting Fluid	A liquid used during cutting operations to reduce heat and friction between the cutting tool and the workpiece. Cutting fluid may contain oil or other flammable liquids and is a potential fire hazard if disposed of improperly.
Cutting Tool	A tool with one or more cutting edges designed to engage a workpiece and remove material in the form of chips. Cutting tools ideally exhibit excellent hardness, toughness, and wear resistance.
Dolly	A low, two- or four-wheeled cart or platform used to move heavy or awkward objects. To use a dolly, a worker must first be trained on its proper usage.
Drill	A multi-point cutting tool used to make round holes. In drilling, either the workpiece is held stationary while the drill rotates to cut a hole to a certain depth, or the drill is held stationary while the workpiece rotates.
Drill Chuck	A type of toolholder that holds drill bits in a machine tool, such as a lathe, mill, or drill press. A drill chuck has jaws and a collar that are tighted to grip a drill bit.
Dry Machining	The process of metal cutting without using fluid for lubrication or cooling. Dry machining sounds different than machining with the use of a coolant.
Earplugs	Ear wear that protects hearing. Earplugs are inserted inside the ear to muffle outside noises.
End Mill	A type of milling cutter that performs both peripheral and face milling with its bottom and side cutting edges. End mills can be used to machine grooves, slots, circular slots, pockets, and contours.
Eye Wash Station	A designated station in an easily accessible area in which employees may flush their faces with water in the event of an emergency. Employees should be familiar with the locations of all eye wash stations in the production environment.
Face Shield	A rigid, transparent plastic sheet that covers the worker's entire face to protect against dust or splashes. Because face shields do not protect against impacts, they are often worn with goggles.
Feeds	The rate at which the cutting tool and the workpiece move in relation to one another. Feed is typically a linear movement.
Feedwheels	The wheel on a lathe that controls the feed of the cutting tool. A feedwheel controls the cutting tool regardless of whether the tool is located on the carriage or the tailstock.
Fixed Guard	A machine guard that is attached to the machine with screws or other devices that require a tool for removal. Fixed guards are generally safer than other types because they are harder to remove.

Fixed Guards	A machine guard that is attached to the machine with screws or other devices that require a tool for removal. Fixed guards are generally safer than other types because they are harder to remove.
Goggles	Tight-fitting eye protection that completely cover the eyes, the eye sockets, and the surrounding facial area. Goggles offer protection from impact, dust, chips, and splashes.
Ground	A means of providing a safe path for electricity should it stray from its intended path. An object is grounded if a wire connects it to the earth, preventing a build up of electric charges.
Hand Truck	A wheeled cart, used for moving heavy objects, that can be pushed or pulled and is often equipped with a brake. To use a hand truck, a worker must first be trained on its proper usage.
Interlock Switch	A switch that shuts off or disengages the power whenever the CNC door is opened or pushed out of position. The interlock switch can be overridden, but this is not recommended for safe machine operation.
Lathe	A machine tool commonly used to create cylindrical parts. A lathe holds a cylindrical workpiece on one or both ends while the cutting tool is gradually passed along the surface of the rotating part.
Leadscrew	The long, threaded device that controls the precise movement of the components of a machine tool. Improper contact with this moveable component can cause operator injury or machine damage.
Machine Guard	A shield or covering over hazardous areas on a machine to prevent contact with body parts and to prevent debris from exiting the machine. Machine guards often partially cover the point of operation while allowing necessary access.
Machine Tool	A power-driven machine that uses a cutting tool to create chips and remove metal from a workpiece. Lathes, mills, and drill presses are all examples of machine tools.
Machining	Manufacturing a part by using a tool to remove material in the form of chips. Milling, drilling, turning, sawing, and grinding are all various forms of machining operations.
Mill	A rotating multi-point cutting tool that is guided along a workpiece to create flat surfaces or slots. Mills are also a type of machine tool used to perform milling operations on a workpiece.
Moveable Guard	A machine guard that can be moved without being removed from the machine. The door of a CNC machine is a moveable guard.
Multi-Point Tool	A metal cutting tool that has two or more cutting edges. Mills, drills, and reamers are all examples of multi-point tools.
Occupational Safety And Health	OSHA. A government agency that sets the standards for working conditions in the United States. OSHA ensures that employees work in safe and healthy

Administration	environments.
Oil Sprayer	A device used to spray lubricant. Oil sprayers can be used by an operator to remove chips from inside a CNC machine.
Overhead Crane	A crane that hoists and carries heavy objects using an elevated fixed runway structure. To use an overhead crane, a worker must first be trained in its proper usage.
Personal Protective Equipment	PPE. Any clothing or device worn to minimize exposure to hazards and prevent injury. Safety glasses, gloves, steel-toed boots, and earplugs are common examples of PPE.
Point Of Operation	The area where the tool comes into contact with the workpiece. Operators must never place anything in the path of the point of operation.
Pounds Per Square Inch	psi. A unit used to measure pressure. Manual machine operators may use an air hose with pressure at or under 30 psi to clear chips.
Safety Data Sheet	SDS. Mandatory information that must accompany almost every chemical in the workplace except for items like cleaning supplies. An SDS includes details such as the hazards, precautions, and first-aid procedures associated with the chemical.
Safety Glasses	Protective eyeglasses with metal or plastic frames and impact-resistant lenses that protect eyes from debris. Many safety glasses also have protective side shields.
Saw	A multi-point cutting tool that is used to rough cut a part to a certain length. A saw is a blade set with a series of teeth on its edge that is used to cut a narrow opening in a workpiece, cut slots or grooves in a workpiece, or to separate the workpiece.
Single-Point Tool	A metal cutting tool that has a single cutting edge. Turning and boring are performed with single-point tooling.
Soluble Oil	A class of metalworking fluid that is composed of lubricant-based oil, emulsifiers, and other additives. Soluble oil is obtained as a concentrate and is then mixed with water.
Sparks	A particle of flame that can ignite any flammable material. Cutting operations that generate sparks are fire hazards.
Speed	The rate that the workpiece surface and cutting tool pass each other at the point of contact. It is imporant to allow a tool to reach its full operating speed before beginning the machining process.
Spindle	The part of the machine tool that spins or rotates. On the mill the spindle holds a cutting tool, and on the lathe the spindle holds the workpiece.
Splash Guards	A plastic shield that covers the point of operation. A splash guard protects the operator from contact with cutting fluids.

Spontaneously Combust	Combustion that occurs when flammable objects burst into flame without being exposed to a fire. Oily rags have the potential to spontaneously combust.
Steel-Toed Boots	Protective footwear made with reinforced steel in the toe area. Steel-toed boots are designed to prevent foot injury from falling objects.
Stock	Raw material that is used to make manufactured parts. Stock is available in standard shapes, such as long bars, plates, or sheets.
Straight Oil	A cutting fluid that is composed of mineral oil or vegetable oil and is mainly used as a lubricant. Straight oil is not intended to be mixed with water.
Synthetic Fluids	A cutting fluid that is made from chemicals. Synthetic fluids are used mostly for their ability to cool.
Tailstock	The moveable lathe component, located opposite the headstock, that supports the end of longer workpieces. Improper contact with the tailstock can cause injury to the operator or machine damage.
Tool Crib	A designated area where extra tools and accessories are kept. The tool crib is also typically where tools can be serviced or repaired.
Toolholder	A device used to rigidly hold a cutting tool in place during machining. Toolholders are classified so that they can be paired with the correct style of insert.
Toolholders	A device used to rigidly hold a cutting tool in place during machining. Toolholders are classified so that they can be paired with the correct style of insert.
Ventilation Systems	A means of cleaning or re-circulating contaminated air. Ventilation systems are necessary to prevent cutting fluid inhalation.
Vise	A workholding device with two jaws that grip and hold a workpiece in place. On a vise, one of the jaws is fixed and one is moveable.