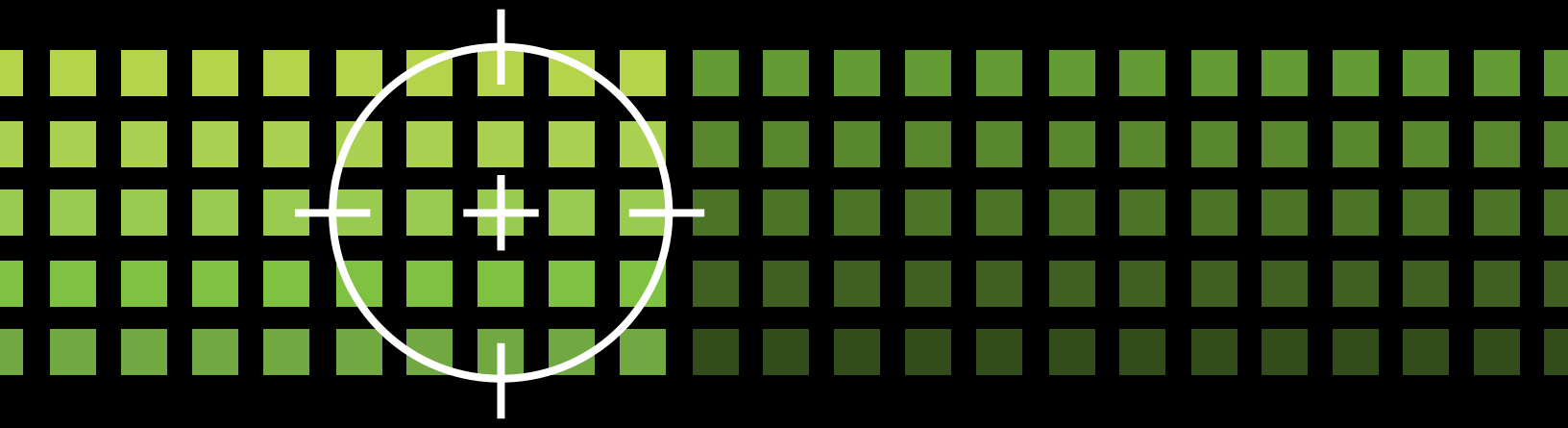
UNIST

Environmentally Friendly Lubrication

Coolubricator™

Continuous Precision



Coolubricator™ *Continuous Precision*

What Is MQL?

Minimum Quantity Lubrication (MQL) replaces the flood coolant commonly used in machining operations with a minute amount of high-quality lubricant precisely applied to the interface of the cutting tool and work piece. The lubricant minimizes friction between the material and the tool, greatly reducing the heat that is generated during machining. In contrast, the purpose of traditional flood coolant is to absorb the heat after it has been created. MQL technology has been used for over 25 years and has proven its effectiveness in a broad range of machining operations.

Applications Include:

- Sawing
- Drilling
- Tapping
- Milling
- Routing
- Turning
- Broaching

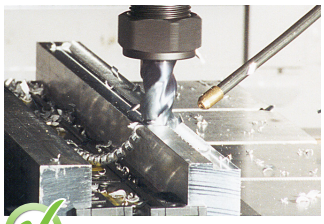
Why Use MQL?

Many of the benefits of MQL are a direct result of eliminating flood coolants and the issues they create. Studies have shown that the cost of dealing with flood coolants, including mixing, treatment, circulation, and disposal can account for up to 15% of total machining costs. Additionally, splashing coolant often coats equipment and surrounding areas, negatively affecting machine reliability and creating hazardous, slippery floors.

MQL technology eliminates flood coolant.

In contrast to using flood coolant, an MQL applicator, such as the Unist Coolubricator™, dispenses environmentally-friendly lubricant in such minute amounts that it is often consumed in the process. This leaves little or no excess fluid to clean up or dispose of, and the chips produced are dry enough to be recycled without additional processing. If those benefits aren't convincing enough, replacing flood coolant with Unist Coolube® lubricant and a Coolubricator™ can increase cutting tool life and improve surface finishes!

Machining with flood coolant



Machining with MQL

Why The Unist Coolubricator™?

With Minimum Quantity Lubrication, it's important to apply the proper amount of lubricant for each machining operation. The design of the Unist Coolubricator™ assures consistent fluid delivery with an adjustable positive-displacement pump and a precision air metering adjustment. The correct quantity of lubricant and air can easily be "dialed in" to achieve the perfect spray for each application.

It is not only the adjustability and precision of the Unist Coolubricator™ that keeps our customers satisfied, but also our unrivaled quality. Unist products are built to provide years of service in tough, industrial environments. We take pride in the quality of our equipment and each Unist system is thoroughly tested in our shop before making its way to yours.

Coolube® is consumed in the process.

Why Coolube®?

Unist Coolube® is a 100% natural biodegradable lubricant derived from renewable vegetable products. It is specifically formulated for superior results using MQL and contains no VOC's, chlorine, or silicone. It will not irritate machinists' skin or stain parts, and will never oxidize or leave a sticky residue. When considering the minute amount of Coolube® required compared to traditional flood coolant, Coolube® is one of the most cost effective metal cutting fluids available. As an added bonus, Unist guarantees the pumps forever when Coolube® is exclusively used in a Coolubricator™.

LIFETIME PUMP WARRANTY

Your Coolubricator's™ pump is guaranteed for life when used exclusively with Unist Coolube® Lubricant

Evaluate A Unist MQL System | *Ask About A Free Trial!*

Coolubricator™

A cutting tool's best friend!

Free 30 day on-site trial!

Experience the benefits of the Coolubricator™ in your shop free for 30 days.

- Produce dry chips with higher recycling value
- Eliminate flood coolant treatment & disposal
- Apply ounces per day instead of gallons
- Eliminate carbide tool thermal shock
- Eliminate flood coolant mess
- Increase production rates
- Improve surface finish
- Extend tool life

Precise Fluid Application

Precise fluid application is the key to maximizing the benefits of Minimum Quantity Lubrication. Applying too much lubricant is a waste and can adversely affect chip formation, whereas inadequate lubricant reduces tool life. Precise fluid application requires accurate pumps for consistent lubricant delivery and appropriate nozzles to create and direct the spray.

The adjustable positive displacement pumps used in the Coolubricator™ have a proven track record of consistency and reliability. Their unique modular design allows multiple pumps to be "stacked" together when more than one nozzle is required, allowing every system to be tailored specifically for the application. Each pump module includes a stroke adjustment for the pump output and a precise metering screw for the nozzle air flow. The combination of these adjustments provides complete control of the spray output.

Although supplying the perfect amount of fluid is important, it doesn't do any good unless it is properly delivered to the cutting tool/work piece interface. To make this possible, Unist has developed a wide variety of nozzles to apply the lubricant precisely in nearly any metal cutting operation.

Easily adjust cycle rate, pump stroke, and air flow for the perfect spray.

Typical Coolubricator™ System

A. Air filter
Standard on every system with enclosure

B. Control valve
Options include solenoid valve (shown), air pilot valve, manual valve, or foot valve

C. Positive-displacement metering pump
Precise and reliable with full stroke outputs of 0.033 mL, 0.100 mL, or 0.045 mL

D. Pneumatic pulse generator
Controls pump cycle rate

E. Air metering screw
Controls nozzle air flow
(not present on oil-only pumps)

F. Pump stroke adjustment knob
Controls volume of fluid delivered per stroke

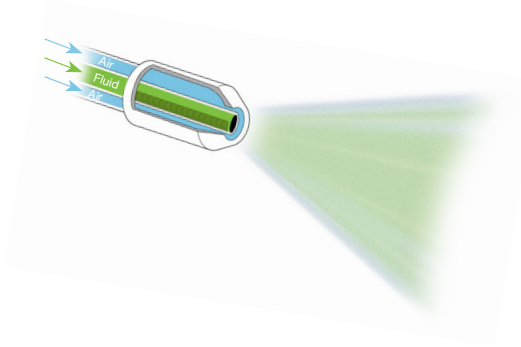
G. 16 oz [473 mL] fluid reservoir
Additional sizes and styles available

H. Rugged steel enclosure
Removable cover for easy adjustment or maintenance (optional keyed lock)

I. Drain plug
Use to empty fluid from pump stack, reservoir, and to bleed trapped air

J. Outlet port
Connection port for coaxial or oil-only outputs

LIFETIME PUMP WARRANTY
Your Coolubricator's™ pump is guaranteed for life
when used exclusively with Unist Coolube® Lubricant

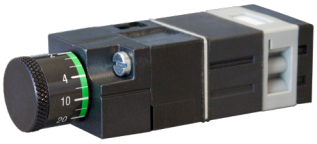


Separate Fluid & Air

Keeping the fluid and air separate until the point of application is the key to delivering consistent spray output over extended lengths of supply tubing. Unist's coaxial nozzles excel at this by combining the fluid and air directly at the nozzle tip. The "jacket of air" surrounding the fluid outlet evenly atomizes the fluid and delivers it to the cutting tool in a balanced spray pattern.

Continuous Fluid Output

Continuous fluid output is made possible with the Coolubricator's™ built-in variable rate pneumatic pulse generator. The pulse generator allows for automatic repeat cycling of the lubricant pumps. The result is a continuous supply of lubricant controlled by the pulse generator's 5-200 pulse/minute air output which cycles each positive-displacement pump.



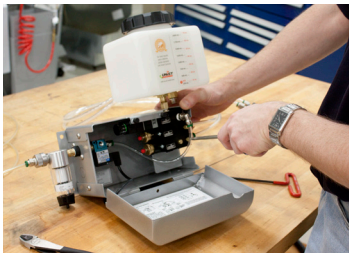
Dial In The "Sweet Spot"

Individual machining operations each have their own "sweet spot," or the precise amount of lubricant necessary to run efficiently. Too little or too much fluid, and the tool life or machining performance can suffer. The Coolubricator™ was designed for precise control over the fluid application with separate fluid and air volume adjustments. This means finding the sweet spot for your application is a breeze and once it's set, the Coolubricator™ will deliver the perfect amount of fluid again and again.

Coolubricator™ + Coolube®

Maximize the benefits of MQL by filling your Coolubricator™ reservoir with Unist Coolube®. Coolube® is a 100% natural biodegradable lubricant derived from renewable vegetable products that is friendly to the environment and machinists. When applied properly, Coolube® is completely consumed in the machining process and the mess of traditional flood coolant is eliminated. As an added benefit, when a Coolubricator™ is used exclusively with Coolube®, Unist guarantees the pumps forever!

Coolube® 2210 & 2210EP are USDA certified biobased products



Testing a Coolubricator™

Unist Quality: Triple-Tested Performance

At Unist, the quality of our products is extremely important to all of us. That's why each Coolubricator™ undergoes an extensive 3-step testing process. We begin by fluid testing each metering pump individually to ensure proper output and function. Following that, we test the entire pump assembly before verifying the operation of the finished Coolubricator™ assembly for a third time with Unist Coolube® lubricant.

For more information visit: unist.com/coolubricator

Configuration Options

Multiple Outputs

Operate up to 16 pumps for 16 individual outputs. Outputs can be configured to operate independently or in multiples. Various sized enclosures are available depending on the number of pumps.

1-3 outlet enclosure

4-6 outlet enclosure

7-11 outlet enclosure

12-16 outlet enclosure

Air Valves

Control Coolubricator™ operation with the following valve options:

- **Solenoid valve**
  For actuation using an electrical signal from the machine

(Available in 24, 110, 220, 440 VAC and 12 or 24 VDC)

- **Air pilot valve**
  For use with a low flow air signal

- **Manual valve**
  3-way slide valve for simple manual on/off control

- **Foot valve**
  For hands-free manual operation

Pumps

Choose the appropriate pump output and type for each application.

- **Standard 1-drop pump**
  (0.03 mL per stroke)

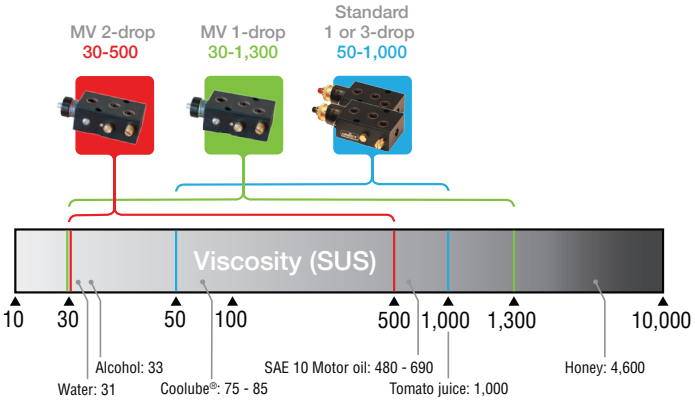
- **Standard 3-drop pump**
  (0.10 mL per stroke)

- **Multi-Viscosity 1-drop pump**
  (0.045 mL per stroke)

- **Multi-Viscosity 2-drop pump**
  (0.10 mL per stroke)

The fluid viscosity will determine the type of Unist pump required.

- For Coolube® and other fluids between 50 SUS and 1,000 SUS, choose the standard 1 or 3-drop pump.
- For fluids less than 50 SUS, choose the Multi-Viscosity (MV) 1 or 2-drop pump.



Need assistance configuring your system? We can help!

Reservoirs

A wide variety of fluid reservoirs are available.

16 oz [473 mL] polyethylene

32 oz [946 mL] polyethylene

64 oz [1893 mL] polyethylene with low level switch

(Also available without a low level switch)

Air trap for use with a pressurized fluid supply

Mounting

System enclosures can come with or without magnetic mounts.

Bolt-on

Magnetic mount

Enclosure Lock

Upgrade from the standard thumb latch to a keyed lock and prevent tampering.

Nozzle Extensions

Three types of hose/tubing are available for connecting nozzles to a Coolubricator™ system. Standard length is 5 ft [1.5 m]. Other lengths are available upon request.

- **Coaxial polyurethane**

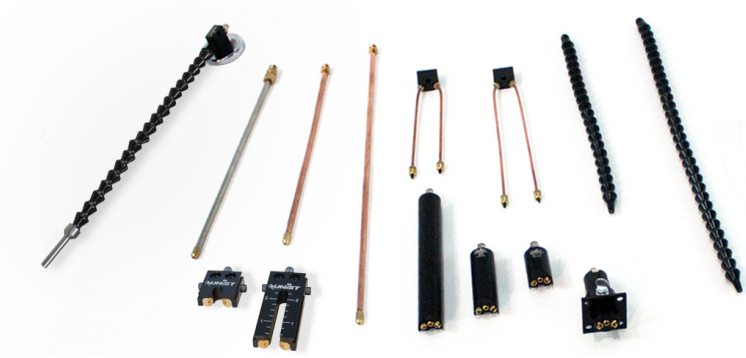
- **Coaxial braided stainless steel**

- **Single line**

Nozzles

Unist has a wide variety of MQL nozzle types to fit each specific application.

Air blow-off nozzle options are also available to aid in chip removal.



Coolubricator™ Applications

The Coolubricator™ offers excellent performance on manual or CNC machines. Please use the following pages to learn more about Coolubricator™ performance and options in common applications.

Don't see your application?

We may have information on Coolubricator™ performance for your specific application. Contact us for information or to inquire about a possible free in-plant 30 day trial.

800.253.5462
U.S. & Canada

616.949.0853
International

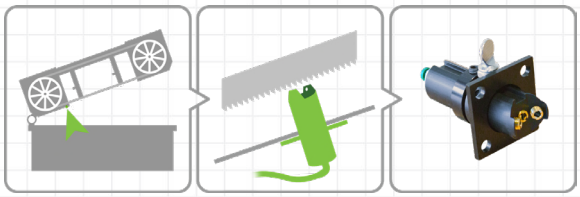
Email salessupport@unist.com

Band Sawing

Equip your Coolubricator™ with one or more of Unist's specialized nozzle configurations and enjoy all the benefits of MQL with your band saw. The Coolubricator™ can precisely deliver the perfect amount of Unist Coolube® lubricant directly to the critical areas of the saw blade and guides.

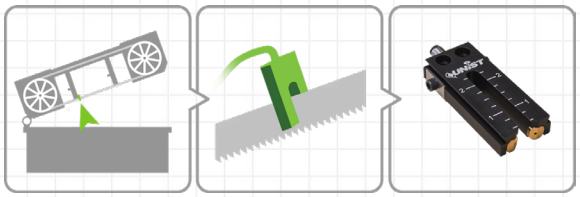
Bat Nozzle - Mounted through the blade guard (all band saw applications)

The Unist Bat Nozzle provides superior coverage with three outputs aimed at the blade side and the gullet of the teeth. Available in 1.6" [40.6 mm], 3" [76.2 mm], and 7" [177.8 mm] lengths to fit any size blade guard.



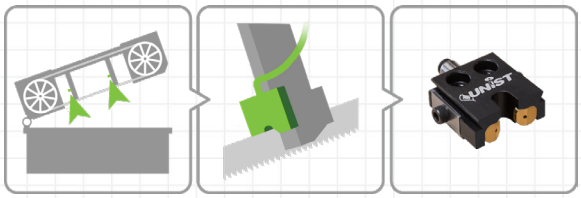
Band Saw Blade Nozzle - Mounted to guides or guard with mounting kit (horizontal band saw applications)

The Band Saw Blade (BSB) Nozzle provides users with alternative mounting options and delivers an ideal spray pattern for horizontal band saw blade lubrication. Its smaller footprint makes for easier mounting and less intrusive installation. When mounted to the blade guide, proper positioning is easy when using the built-in ruler guide. Simply align the top of the blade with the appropriate blade size marking and secure the nozzle in place. The available mounting kit provides additional mounting flexibility.



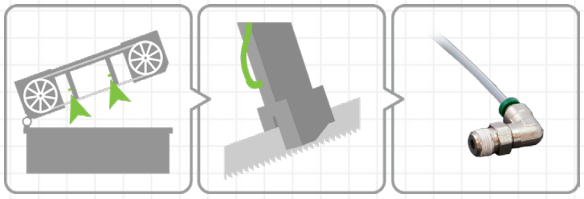
Band Saw Guide Nozzle - Mounted to the blade guide (horizontal band saw applications)

When blade guide lubrication is required, the Band Saw Guide (BSG) Nozzle will lubricate the sides of the blade to help minimize friction. The BSG Nozzle can be mounted directly to a guide block, to the BSB Nozzle, or installed with the mounting kit. When paired with a BSB Nozzle, this will provide lubrication for both the cutting edge and the sides of the blade.



Existing band saw coolant ports - (band saws equipped with coolant ports)

The Coolubricator™ can be directly connected to your band saw's existing coolant ports to lubricate the blade guides.

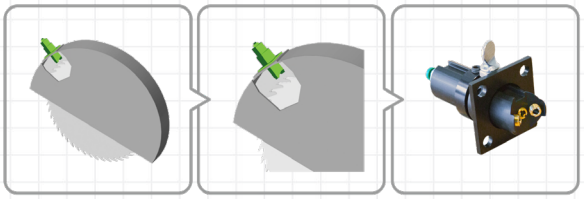


Circular Sawing

The Coolubricator™ is excellent for circular sawing applications and can precisely deliver the optimal amount of Unist Coolube® lubricant directly to the critical areas of the saw blade.

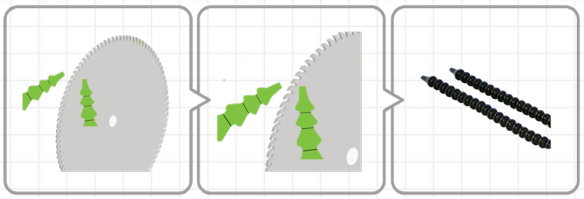
Bat Nozzle - Mounted through the blade guard (circular saws equipped with guard)

The Unist Bat Nozzle provides superior coverage with three outputs aimed at the blade and the gullet of the teeth. Available in 1.6" [40.6 mm], 3" [76.2 mm], and 7" [177.8 mm] lengths to fit any size blade guard. For applications where the Bat Nozzle cannot easily be mounted or will not fit, use coaxial nozzles or a splitter nozzle.



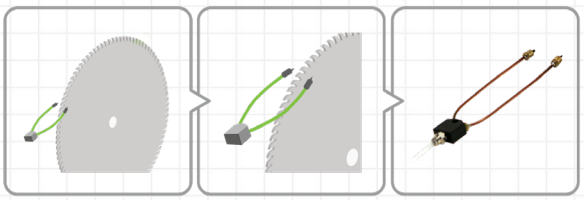
Coaxial nozzles - Directed at the saw blade

Use two coaxial nozzles for applications where a Bat Nozzle cannot easily be mounted or will not fit. The nozzles should be positioned to spray the sides of the blade and into the gullet of the teeth.



Splitter nozzle - Directed at the saw blade

For applications where neither a Bat Nozzle or coaxial nozzles will fit, a compact splitter nozzle could be the best solution. The nozzles should be aimed to spray the sides of the blade and into the gullet of the teeth.

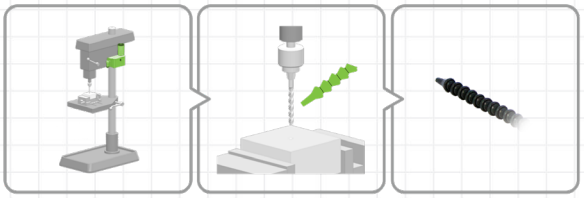


Drilling

The Coolubricator™ is an excellent solution for drilling applications and will reduce drill wear and improve hole quality.

Coaxial nozzle - Directed at the drill

A single coaxial nozzle directed at the interface between the cutting edge of the drill and the work piece at a downward angle is recommended. Pecking may be necessary on deep holes for reapplication of lubricant.

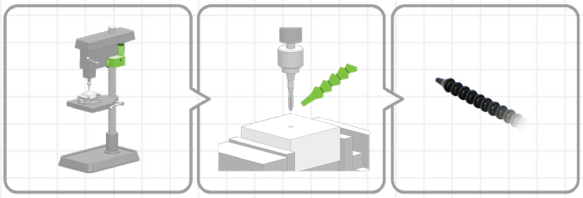


Tapping

The Coolubricator™ is an excellent solution for tapping applications and will reduce tap wear and improve thread quality. Great for use with both cutting and forming taps.

Coaxial nozzle - Directed at the tap

A single coaxial nozzle directed at the interface between the cutting edge of the tap and the work piece at a downward angle is recommended. Pecking may be necessary for reapplication of lubricant on deep tapped holes.

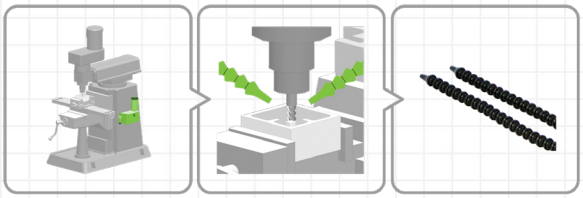


Milling

The Coolubricator™ is well suited for milling applications. Benefits typically include both increased tool life and improved surface finishes.

Coaxial nozzles - Directed at the milling cutter

Two coaxial nozzles positioned 180˚ apart and directed toward both sides of the cutting tool are recommended for the best results.

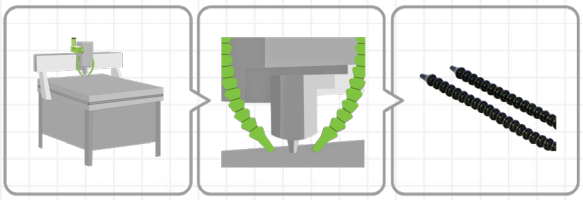


Routing

A Coolubricator™ is superior to flood coolant or totally dry machining for CNC routers. A Coolubricator™ system will increase tool life and not create a mess like flood coolant.

Coaxial nozzles - Directed at router cutter

Two coaxial nozzles positioned 180˚ apart and directed toward both sides of the cutter are recommended for optimal results.

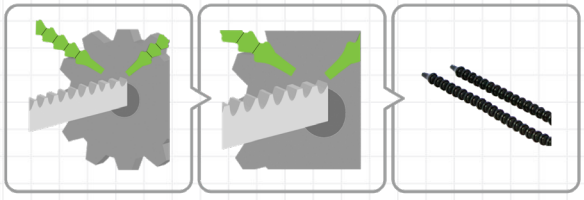


Broaching

The Coolubricator™ is the ideal lubrication solution for broaching, although it may need to be combined with compressed air to blow off the chips.

Coaxial nozzles - Directed at the broach

Two coaxial nozzles 180˚ apart at a downward angle directed perpendicular to the broach are recommended.

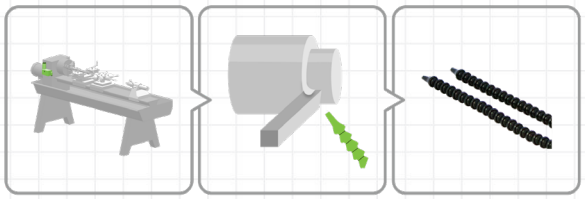


Turning

The Coolubricator™ system is an excellent choice for CNC and manual lathes. It is an especially good alternative to flood coolant for manual or tool room lathes that do not get used frequently. The Coolubricator™ system will be ready to use when needed and does not require any machine clean up or fluid maintenance.

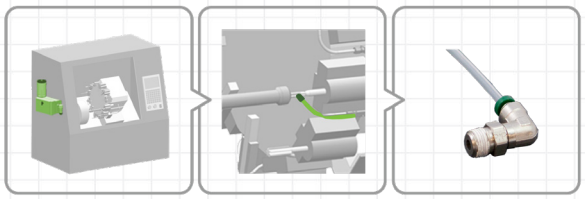
Coaxial nozzles - directed at back side of the cutting tool (external spray on a manual lathe)

Optimum lubrication will be achieved by directing a single coaxial nozzle at the back side (non-cutting edge) of the cutting insert.



Through the turret - Directed at cutting tool (external spray or through-the-tool CNC turning center)

The Coolubricator™ can deliver metered lubricant through a CNC turning center's coolant ports. The ability to apply MQL this way depends on the design of the machine turret.



Notes

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