Why Accurate Machine Tool Coolant Mixing Is Important to Me:

An Article by Dosatron International's Craig Peterson

I was recently asked why accurate coolant mixing is so important; after all isn't "close enough" good enough? The answer is absolutely… NOT!

In today's highly competitive machining industry, efficient and lean production are critical keys to growing your business. Partnering with a knowledgeable coolant supplier, who can provide the best fluids for your specific process, can go a long way in helping you achieve that growth.

What Are Some Functions of Cutting Fluid?

1. Properly lubricate the tool and work piece to reduce friction and heat
2. Flush chips from the work surface

Something equally important to your business growth, yet often overlooked, is accurate mixing of your coolant. Improperly mixed coolant will negatively affect both functions of cutting fluid.

What Happens if Coolant Concentration Is Too High or Too Low?

Low concentration

1. Reduces tool life resulting in premature tool replacement and increased production costs
2. Increased part reject rate also increasing production costs
3. Increased bacterial growth impeding heat transfer, cutting efficiency and prompting unnecessary manual "adds" in an attempt to control growth

High concentration (More really isn't better)

1. High concentration can create a barrier between the tool and work piece reducing heat carry off and decreasing tool life
2. Reject rates will increase because of prematurely worn machine tools
3. Air filtration becomes less efficient resulting in respiratory issues
4. Dermatitis conditions increase
5. Foaming will increase reducing the efficiency of tramp oil skimmers and increasing disposal costs

For these reasons its clear to see why accurate, consistent mixing of coolant and water is so important!

What Are the Most Common Mixing Methods?

The two most common methods of mixing coolant and water are:

- Barrel mount venturi mixers
- Water driven proportional injectors

Venturi

Barrel mount mixers have been used for many years. Working off the venturi principle, the mixed coolant concentration is controlled by adjusting the orifice size through which the concentrate is being drawn. As city water pressure and flow vary throughout the day, the amount of concentrate drawn will also vary, causing wide swings in mixed coolant concentration. This results in the headaches we've already discussed. If water pressure drops too low, the venturi may not even draw concentrate, resulting in straight water being added to the sump, and over-diluted coolant. Seasonal changes in temperature will increase the viscosity of coolant, also resulting in inaccurate dosing.

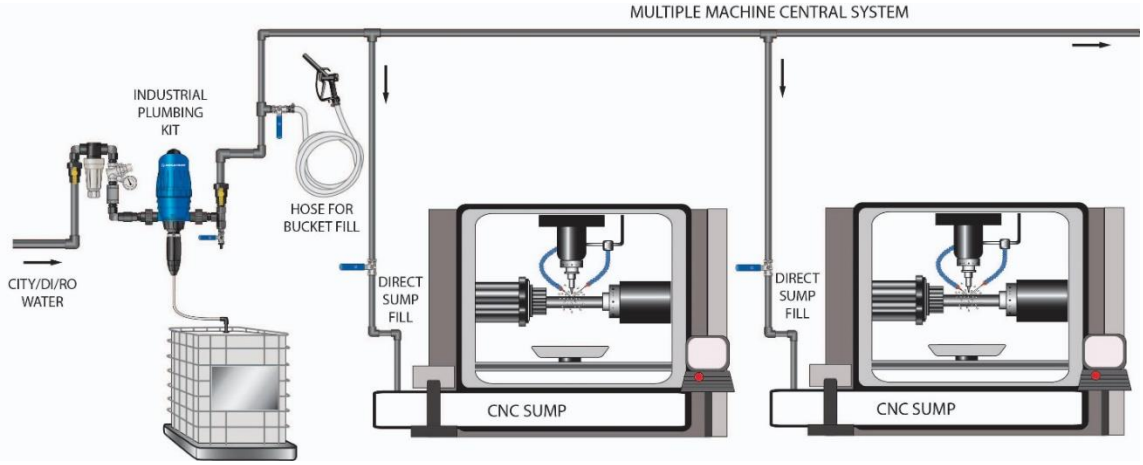


Water Driven Proportional Injectors



Water-driven proportional injectors have become the industry standard for accurate coolant dosing, providing the most consistently mixed coolant possible.

These injectors use the flow of water to drive a piston in a vertical stroke. That piston is connected to a syringe-like plunger that draws the coolant concentrate proportionate to the water volume. The speed of the piston stroke automatically increases or decreases in relation to the flow, providing an accurate, consistent mixed coolant solution. Coolant concentration is easily adjusted by turning the threaded collar up or down, adjusting the depth of the plunger stroke to increase or decrease concentration. Viscosity changes do not affect the consistency of the mixed coolant like with the venturi.



So, it's clear, choose your coolant dosing equipment wisely. *Close enough is only good with horseshoes and hand grenades, and you don't ever want to blow up your bottom line!*