

SETTING STANDARDS

Industry needs metalworking-fluid standards.

Cut her in two! Make the elephant disappear! Magic is indeed wonderful—as entertainment. It's mysterious, diverting and helps us forget our troubles. But magic won't increase activity in the U.S. manufacturing sector as it hits 18-year lows.

Solving real problems involves real hard work. It takes commitment, thought and action. We have to increase business, which means selling more and selling smarter. And we have to decrease costs, which means buying smarter and establishing better maintenance practices.

Concerning maintenance, there is one area where end users believe magic still reigns: metalworking fluids. The basic MWF consists of water and oil—that's it. Modern MWFs contain other ingredients to satisfy special needs, but according to the manual from the Cincinnati-based metalcutting-research organization TechSolve Inc., a MWF must cool and lubricate the interface between the tool and workpiece. This extends tool life, allows machining at higher speeds and feeds, enhances part quality, flushes chips or swarf from the cutting zone and temporarily protects the part from corrosion.

There are reasons why MWFs are formulated the way they are. The reason they consist mostly of water is because water is great for cooling the workpiece and tool. The reason oils are



mixed in is to reduce the friction between the tool and workpiece. The rest of the ingredients help the oil stay in emulsion, reduce corrosion and lets users differentiate among brands.

It's unfortunate that many end users think MWFs magically make tools last

longer and parts look better. Believe it or not, if you took the magic out, you could save \$30,000 a year.

Start by taking care of your coolant. You pay to bring it in, maintain it and have it hauled away. But chances are you don't know how much it costs.

So what's keeping you from saving \$30,000 annually? The quick answer is that you probably don't have a fluid standard in place.

DaimlerChrysler, of Germany, estimated its fluid costs as being 16 percent of its total production costs.

How much is it in your shop? Probably not as much. You don't worry as much about things like environmental hazards and keeping the fluids at optimal efficiency. You probably just run it until it starts reeking or until a machinist's skin turns green.

But consider the numbers. According to TechSolve, the average U.S. shop spends about \$60,000—directly and indirectly—on MWFs annually. A lot of that cost is in labor and downtime, due to frequently changing out bad fluids.

The fact is the technology already exists to cut MWF costs in half. The average shop could spend less than \$30,000 on MWFs per year. With about 100,000 machine and production shops in the U.S., the result would be \$3 billion in savings. (Such a cost-savings could save a few jobs and make the U.S. more competitive!)

So what's keeping you from saving \$30,000 annually? The quick answer is that you probably don't have a fluid standard in place. If you don't, you need to establish one.

Measured Course

Standards establish performance levels and specify measurement procedures. For example, if you see a drawing that shows a hole described as 0.200" (+0.002"/-0.000" and <1 percent eccentricity), you know the hole must be machined a certain way to achieve the specified size.

You also know the tool drilling that hole has to be watched carefully for wear, and its speed has to be chosen carefully to avoid any kind of eccentric drilling. The customer wants a perfect hole and you have to provide it.

The difference between having and not having a holemaking standard is what keeps some shops profitable and others in the red. The better the stan-

dard is defined for your operation, the better your parts are and the more money you save.

It's the same with your MWF. You need to know when it's performing at a less-than-optimal level.

So, the next time your coolant salesman comes in and does his song and dance, ask him how to measure the fluid's on-the-job, real-life performance. Ask which components are important and how to measure them. If everyone demanded this information, you'd be surprised how fast you'd start getting answers.

Example performance capabilities to be measured include:

- friction reduction;
- cooling;
- anticorrosion; and
- oil rejection.

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All MWF standards should be based, at minimum, on the two primary functions of a coolant: Its ability to cool the tool and workpiece, and its ability to reduce friction when making chips. Focus on these two functions like a laser beam and figure out reliable and inexpensive ways to measure them. Then apply that knowledge in your shops.

Think about it. You buy, mix, use and maintain MWFs. And, over time, the ability of the MWF to do its job decreases. One day, it decreases to the point where it's not doing its job at all. Then—and only then—get rid of it. The point of disposal should be based on the

standard your shop sets—not your nose.

You should also know that there are standards under development—unfortunately. Government committees are writing some and others are being developed by organizations that make their living charging for tests. But none of these entities are taking a real-world, nitty-gritty look at the MWFs job shops use every day.

In the U.S., the Occupational Safety and Health Administration and the Environmental Protection Agency have worked on standards. Luckily, the EPA funded a study through TechSolve and the rough-draft standards are some of the most practical available (see "Pollution Prevention Guide to Using Metal-Removal Fluids in Machining Operations" at http://www.iams.org/pdf/greenfluids_manual.PDF).

The TechSolve committee includes representatives from many industries. It probably comes as no surprise, though, that some coolant companies oppose setting fluids standards. Why is that? Because once you have a yardstick, you don't care if the MWF is clear or pink, or if it smells like a spring rain or strawberries and cream. All you have to do is measure it, which you can do.

If you're a "can-do" person who knows that using his noggin keeps the U.S. ahead as a nation, then do yourself a favor and set a MFW standard for your shop. It's not hard.

There is one thing to be afraid of, though. If you don't set your own standard, then someone else will. Would you rather have OSHA telling you what performance characteristics your coolant should have, or would you rather do it yourself? Think about it. Get angry. Then do something. All you have to save is money. What's to lose? Lots of magic.

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