

Many—if not all—of the processes, equipment, and materials used in gear manufacturing can be dangerous, so be sure to use the proper safety procedures in order to keep your employees safe.


Last month's column was on how to go about creating a safety manual. In that column I listed a large number of topics that I felt should be included in your manual. One item I neglected to cover was the fluids used in gear cutting. This month the focus of the magazine is lubrication, and in conjunction with that I want to emphasize that lubricants and cutting oils are a concern in any gear-cutting environment. A lot of gear-cutting equipment also employs hydraulic oils. Of course, a lack of any of these fluids—or worn-out fluids—is a major cause of concern, but there are a number of other factors that enter into the safety aspect of these fluids. We often hear of skin irritations as a result of contact with cutting oil. We are also aware of the odor issue, and the proper disposal problem. I have touched on some of these problems and some possible resolutions in previous columns. I recently read an article in the February issue of *Cutting Tool Engineering* that discussed the use of vegetable-based metalworking fluids that I felt was very interesting. The title was "Going Green," and it addresses many of the concerns that enter into our use of fluids in the gear-cutting industry. I suggest that you look into the use of vegetable-based metalworking fluids as a viable alternative, particularly from a safety standpoint.

In last month's column I also mentioned that you would probably find the "statement of company policy" to be the most difficult part of your safety manual to compose. Some things that enter into this policy

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statement are: What types of injuries are being experienced? Have our injury types differed over the years? How do we stack up against our competition, both locally and nationally? What kind of "workdays lost due to injury" record does the company have? What are the company's benchmarks for reasonable performance when it comes to injuries? A good source of information is the Bureau of Labor Statistics [www.bls.gov] and OSHA [www.osha.gov]. These sources will help you judge your company performance against others in the industry. Once you have these answers in place you should find it a lot easier to come up with a clear and concise statement. The statement should not consist

only of "we want it to be safe." Common sense dictates that the statement should also contain attainable goals and responsibilities.

Another topic that is addressed in this month's issue is broaching. Broaching is a common operation performed in gear-cutting shops, but it is also one of those "secondary operations" that tend to get ignored as far as safety is concerned. Power broaching can be a dangerous process. Many small shops have an older horizontal or vertical broach that is sorely lacking proper safeguarding. Broaching is a process that uses an enormous amount of power (pressure) to remove material. Improper blanks, cutting fluids, dull broaches, weak tooling, and operator neglect are just a few of the dangers inherent to this process. Another consideration when dealing with a broach is that the tool is usually moved under hydraulic pressure, and when maintenance or even tooling changes need to be performed, it is important that the hydraulics be disabled. Some of these machines are equipped with accumulators, so it is very dangerous to work on them without the rams being physically locked out. The maintenance personnel who perform this service should be instructed in the proper procedures to lock out the hydraulics, including the tags that indicate the machine is locked out. This is necessary in the event that someone attempts to start the machine without knowing the work is being performed. The ANSI "Lockout/Tagout" standard must be used. 

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