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Coolant and Filtration questioner for processing Steel and Carbide

Basic Information

The most important factors other than the quality of the grinding wheel and grinding equipment used affecting Superabrasive grinding wheel life is the coolant used and the following parameters: coolant pressure; filtration and chilling. For optimum performance, high pressure coolant velocity should be used to clean the wheel surface. The coolant should be under constant filtration and when, possible chilled. Viscosity of the coolant and coolant levels are very important. A clean machine and work area and set up are very important to make sure the grinding wheels are locked securely preventing any run out and premature wear.

Basic Rule

If the swart removed by the grinding wheel is not properly removed from the returned coolant and kept away from the grind zone, the grinding wheel will not perform to its' optimum capability; it will load easily and the Diamond or cBN will not micro fracture properly. The cleaner the coolant is kept, the better and more repeatable the performance can be expected and charted.

Questions

In order for Dianamic to offer suggestions for better wheel life, we need the answers to the following questions.

1. What type of coolant are you using currently? Oil or water soluble oil or synthetic? Who is the manufacturer?
2. What is the micron filtration? In other words, 5 micron? 10 micron? 50 micron? etc.
3. What type of filtration? Is it paper? Centrifugal removal? Sedimentation? None? Other? Describe.
4. If you have high velocity cooling system, what is PSI is the high pressure coolant velocity at and where is this pressure pointed?
5. The coolant at the grind zone is applied how?
6. Is chilling used to keep the coolant cool?
7. How often are the filtration tanks or filtration system cleaned?
8. Is it a regular schedule or does the system let you know that it's time for cleaning?

Coolant and Filtration questioner for processing Steel continued

9. Do you keep records of wheel use with the average of stock removed and wheel use before cleaning is done? In other words do you grind X amount of parts always: and always remove the same Y amount of stock? And always use the same Z amount of grinding wheels before cleaning?
10. If records are kept? Are the results repeatable? If not, what are the differences in the process, and what do you attribute the differences to?
11. What is the speed of the wheel and what is the stock removal rate.
12. What grade steel or carbide is being ground?
13. If using steel, what is the material hardness?
14. What is the expected micro finish requirement? Is this requirement being satisfied with the mesh size currently used?
15. Does your grinder have a load meter showing how much Amperage is being drawn or what the load is on the grinding wheel during use? And if yes, is the meter used to decide when to remove the grinding wheel and replace with new?
16. Do you keep records of wheel performance? That is, how many pieces is being ground with each grinding wheel? Have you charted any difference between "clean" coolant versus "un-cleaned" coolant?
17. What are the deciding factors to remove a grinding wheel and be replaced?
18. Is the grind process automatic? If not an automatic process, what training does the operator receive to make the decisions regarding rate of stock removal and replacement of grinding wheels?
19. Are there written protocols and instructions on when to replace a grinding wheel; how to mount the grinding wheel; and most importantly on how to position the coolant jets and flood coolant? Or are the jets and flood locked in position for optimum performance?
20. Is there any substantial difference of the pre ground size of the product being ground? That is do some parts require more stock to be removed than others to come to print specifications? In other words, do some of the raw parts require more time to grind to come to print sizes?

The answers to these questions, and any other information that you may deem useful is very important. Please keep in mind that recommendations cannot be made if the information is incomplete or not clear.