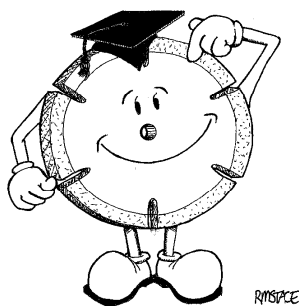




Diamond blademan

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The importance of blade cooling water.

It is important to understand the functions of water when used as a coolant with diamond saw blades and other impregnated diamond tools. Its principal functions are to:

- Cool the blade
- Remove swarf

The life and cutting performance of a diamond blade are both improved by the correct application of water at an adequate volume and pressure. See table below:

Water coolant prevents both the matrix (bond) and diamonds from overheating. Excessively high temperatures can weaken the bond and cause premature loss of diamond and or degrade the diamond itself.

The blade steel core needs to be kept cool to prevent warping and twisting or loss of tension (ability to run true at working speed).

Swarf needs to be controlled in such a way as to create the correct self sharpening effect on the diamond segments without wearing away the steel core too rapidly.

In practice this means that the operator must regularly inspect the water system as it is absolutely fundamental to controlling overall cutting costs.

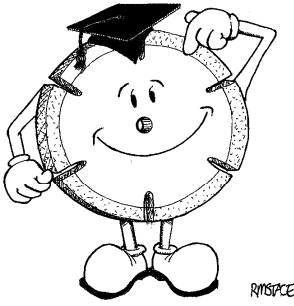
There is a lot of discussion about water pipes and hoses, but little more than lip service is paid to effective water delivery. Usually water is delivered with a garden hose, frequently from a garden tap. Water volume metres are nonexistent on saws and delivery of the water to the blade tends to be a haphazard affair.

Various theories have been put forward about the correct design of plumbing but no standard exists for saws. What is certain is that water needs to be better controlled if lower costs are seriously required.

“ Working safer working Smarter”

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The importance of blade cooling water cont'd.

If we assume an ideal volume of water for a 350mm (14") blade is approximately 14 l.p.m. (3 g.p.m.) for cured concrete, how can we find out if the plumbing will deliver this volume to the blade and effectively get into the cut?

The simplest way is to connect the hose to the water supply and raise the saw until you can get a water container under the blade guard. Turn on the water and see what volume of water is collected by the container in a minute. If at least 4-5 gallons a minute are not being collected you may be underwatering and reducing blade life.

The rule of thumb is set up the plumbing to deliver more than you want, and control delivery with a valve. This will help when you want longer life. A flow meter is also handy here.

Having got the water delivery right, by using larger bore hoses (3/4"), and or larger bore plumbing, how can it best be delivered to get the water in the cut?

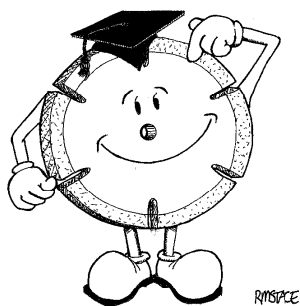
At normal blade speeds, an air barrier forms at about 1/2 way between the flanges and the cutting edge. To get the water to stick to the blade this air barrier must be broken by water pressure or the water must be delivered where there is no barrier.

A simple method is to train the water outlets on the blade near the flanges. Here there is no barrier. The water will, tend to stick to the blade and more water will come out of the cut than with many other systems.

It is difficult to assess the water volume in the cut but it can be estimated fairly well. A way of finding out if the water is about right, is to test the temperature of the water escaping from the cut. Cold water would indicate a volume which is too high for cured concrete, tepid water is about right.

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The importance of blade cooling water cont'd.

If the diamond segment (ie the blade) is wearing too fast increasing the water volume may reduce sharpening of the blade and increase life, on the other hand, reducing the volume might create more abrasion of the bond, and increase diamond protrusion and cutting rates.

In cases like this, it can be beneficial to significantly increase water volume, to reduce the grinding/scouring paste effect on the bond and steel core.

Some cured concretes will be relatively easy to cut and may contain highly abrasive fines requiring a little higher water volume

Too much water can reduce cutting efficiency by aquaplaning the blade and producing a blunt segment, especially true in very hard concretes.

What is clear, is that the operator who pays attention to water supply, cuts more metres per dollar, at better speeds than the operator who doesn't.

Why don't you think about water and improve the profitability of your operation?