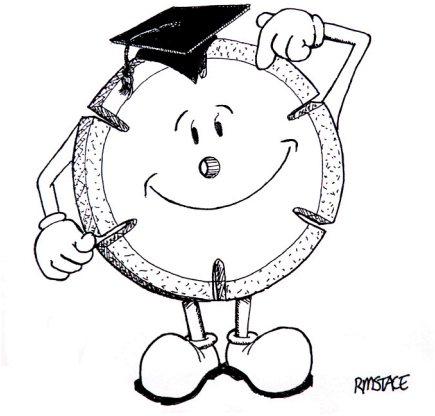

Short diamond blade life

Many small to medium sized contracting companies consider diamond blade life to be a critical part of their daily operation and are keenly interested in the total life of the diamond blade. Few however keep accurate records, or have the luxury of large flat or near flat jobs with consistent parameters and it is against this back ground that this article is written.

Greater diamond blade life can result in higher profits provided productivity is not compromised but wages are such a high percentage of total costs that this side of the equation must be remembered. It may, for example , be more profitable to accept shorter blade life for an increase in cutting rates, especially if the contractor is busy. Some would argue that if the contractor is less than busy he could better spend his time finding new customers, maintaining machinery etc. than worrying about maximum blade life.

There are many variables that affect blade life and about which nothing can be done. These include the type and specification of the material to be cut, the presence of steel and it's type, the location of the job, the length of cuts, the flatness of the job. There are also many variables that can be controlled and which inevitably lead to considerable diamond blade cost savings. We will examine some of the more important ones:

The most important variable to attend to is measurement of the actual cuts made. A 1000 metre cut at an actual 30mm of depth (1181m at

25.4)is a little different to a sloppy estimate of 950 metres at 25.4 mm. The difference is that the blade has cut 231 metres at 25mm more than the recorded cut. Sure there is only 4.6mm in it but it's nearly 20% more material cut. The length underestimation is another 50 metres at 30mm. All up 23.1% extra cutting or put it another way the blade appears to have cut about 19% less than it actually cut.

The message is clear. Accurate measurement and invoicing can make a significant difference to profit and it may well prevent wasted effort looking for other reasons for shorter than expected life.

Blade shaft bearing wear and poor blade shaft diameter/blade bore tolerance can radically reduce blade life through hammering diamond teeth into an early demise. Keeping diamond teeth in good cutting condition for as long as possible is vital to longer tool life. This is easily accomplished by replacing shaft bearings at regular intervals worn or not, and ensuring the blade fit on the shaft is snug. Keeping the business end in good condition is one thing but how that business end is presented to the material is another. Concrete slab saws operate in hostile conditions where abrasive slurry attack is the norm.
Usually the blade shaft bearings go first accompanied by front wheel bearings transmission chain and sprocket wear and pointer pivot innaccuracy. All these saw imperfections need to be attended to if maximum blade life is to be obtained. A straight, hopefully long pointer, with accurately aligned axles, identical sized paired wheel diameters running on smooth bearings guided by an accurate and long pointer will cut straighter and thence shorter and help to keep the blade segment square and wearing evenly. At the stone factory large bridge saws run on precision tracks with computer controls to achieve consistent diamond tool costs.Out on the job we need to be thinking how can we make the operation smooth and accurate.

Now that we have the machine largely sorted out it’s necessary to consider the effects of blade shaft speed and water control.
Higher blade r.p.m. tends to make a blade act harder, and often last longer, and when coupled with consistent correct blade speed from a well tuned engine and driven by a smooth hydraulic drive system miracles can be achieved. Water on the other hand is hard to make consistent with supply problems on may sites. High water volume protects blades in abrasive conditions such as cutting in the under coarse, whereas low volumes increase heat, result in greater abrasion of the diamond segments and steel blade core. Ideally the water plumbing system should be able to supply at least 5 gallons(22.5 litres) of water a minute for asphalt cutting and be able to be adjusted for lower volume for harder less abrasive or weaker materials. Blade saver switches and on board pumps are often used to help with water

supplies. Longer blade life usually occurs when the right amount of water is used. A rule of thumb is; The water ejected from the cut should be tepid not cold and it should high volume for asphalt cutting and abrasive green concretes with the caution that the blade needs some abrasion of the bond to sharpen. It is a mistake to just put maximum water on the blade and hope for the best because it may well result in a dull blade which is difficult to use and unproductive. Water volume is an important contributor to blade life. It can be surprising to find out how much water gets nowhere near the cut. Often poor plumbing design effectively sprays the water into high blade speed areas where it is blown off. A good place to put water on the blade is at about 11 o clock. Plumbed with large bore pipes and fittings and a good tap, water control can be improved on many saws.

Mounting the blade to turn in the correct direction from new and maintaining this direction at every blade mount, means that the tiny bond supports for diamond teeth generated during cutting, will remain intact and maximise potential blade life. Blade flanges too need to be remembered because kept in a clean equal diameter condition they contribute to keeping the blade vibrations to a minimum and thereby increase potential blade life. Being held snugly on an accurate shaft by A1 flanges ensures a happier blade but only if the steel core is flat and tensioned correctly for the speed it will be cutting at. The better the core the straighter the cut and the squarer the segment and the longer the life.

Having talked a lot about the machine we need to look at the operator and how it can effect blade life. In a perfect, world the saw will be operated by an experienced operator keenly interested in achieving longer blade life when it is appropriate. The operator needs to know that blade life will be improved by cutting well within the saws capabilities. Perhaps 75-80% of maximum possible rate of cut. On 4 cylinder engined saws a vacuum gauge is helpful in this regard because it clearly shows when the blade is cutting freely and not being stressed or pushed too hard. An operator who marks the job accurately with a string line or other means and cuts to an accurate depth can make a significant contribution to blade life.

In a nutshell keep the saw in first class mechanical order, operate it with a skilled person, choose the right blade and use it only in the right materials, paying attention to water control depth of cut and measurement and follow the helpful hints the blade supplier has offered.

Remember any maintenance costs will soon be covered by greater diamond blade life, happier customers, better image, higher morale, and improved relations with your diamond blade supplier.

Blade wearing very fast

(see our article "Getting more life from your segmented diamond blade on slab saws" above)

Are you cutting a very hard demanding material?

If so it will consume diamond segments faster through greater diamond wear. Price or charge the work accordingly.

Are you cutting a heavily reinforced concrete?

Steel increases diamond blade wear.

Have you got a water supply problem?

Check the water volume to the blade.It needs to be high for asphalt and luke warm on exit from the cut when cutting for cured concretes. Are the water pipes in good condition on both sides of the blade? are they adequate in bore size? 1/2î (10mm approx.) is best , with a tap for water control.

Are the blade shaft, blade shaft bearings, flanges all in A1 condition? Check to see if the blade is absolutely round. Worn bearings can reduce blade life by 50%!!

Blade will not cut very well

Is the blade the recommended specification for the material and saw machine?

Every material and saw combination requires a closely matched blade for good cost effective performance. An asphalt blade will not cut well in cured concrete because the diamond segment sharpening action is retarded with a hard asphalt bond. The diamonds don’ t protrude very well and so the blade feels blunt. A softer bond is needed.

Are you using too much water? Self sharpening is created by abrasion in the cutting action. If the water volume is too great this action is slowed down and blades can get blunt. Aim for tepid water on exit of the cut for harder materials.

Do you have enough power? A blade designed for high powered saws will usually cut slowly on a low powered saw because it can have a

harder bond and more diamond to work into the material.

Segment loss

Is the steel core gold where the segment has come off? Poor joint manufacture may have resulted in segment loss. If the blade got really hot the brazed joints could have been melted is this possible? Look for blued steel around the outer core area. If itís shiny steel in good condition it could be a warranty claim situation check with us. It happens on rare occasions.

Is the break jagged and characterised by lumps of matrix clinging to the joint area? Thereís a good chance it was caused by something other than a faulty joint. Perhaps the blade was jammed during cutting?

Is the steel core tapered underneath the remaining segments? If so the abrasion in the cutting process has prematurely worn the core. Use a higher volume of water and stay out of base course material. Charge more if thatís what the customer wants you to do and call us about special undercutting resistant designs.

Is the blade too hard for the material?

The diamond segment joints may have been fatigued by friction and duress in a poor cutting situation caused by pounding, impact or twisting especially with a blunt blade.

Diamond blademan

Div. High Performance Diamond Technology Limited

9a Saltburn Road

Milford 0620 NSC

North Shore

Auckland

PO Box 31428 Milford 0741

Tel 09 4867080

09 4866116

Fax 09 4867081

Email a.bignall@xtra.co.nz

Web main site:

Http://www.diamondblademan.com

Web Customer resource site:

Http://www.diamondblademan.co.nz