

Maintain a steady, even pressure. Never force a saw blade beyond its cutting capacity; it will become polished, stop cutting, and may become distorted.



Tips on cutting concrete

Can you save money by using a coolant with dry-cutting diamond saw blades? How do you prevent the steel cores of your saw blades from being undercut around the diamond segments? And how can you prevent blades from getting pinched in deep cuts? Read these tips on cutting concrete to find out.

Plan ahead

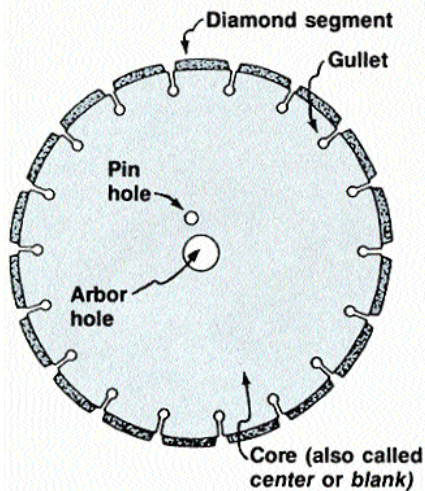
- Hold a pre-job meeting with the owner or the general contractor to determine if there is rebar in the concrete to be cut, what size rebar, where it is located, and how removing it will affect the stability of the structure. Find out where electrical and gas lines are located. Decide who is responsible for removing the cutout concrete and who is responsible for cleanup. How much noise is allowed? Can water be used?
- When ordering blades, make sure you specify the running speed of

your saw and the material you'll be cutting. Use the proper blade, as specified for your application by the blade manufacturer. A blade with a bond that's too hard won't cut; a blade with a bond that's too soft will lose diamonds too quickly. Dry-cutting blades should only be used on low-horsepower saws, which is why dry blades usually are not made with pin holes.

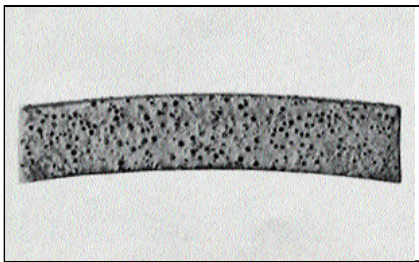
- Except on very small jobs, have at least one standby saw in good working condition.
- Train operators well. A \$1,000 diamond blade destroyed by an operator who forgets to turn on the water makes sawing expensive.
- Use wet-cutting blades for wet cutting and dry-cutting blades for dry cutting.
- When dry cutting, use a blade that is too soft rather than too hard. Dry blades that are even slightly

too hard tend to overheat and crack easily. The most frequent cause of overheating, though, is pushing the blade too hard or not removing it from the cut often enough.

- When cutting abrasive materials that are likely to cause undercutting of the blade (such as asphalt or green concrete), consider using blades with specially designed wear-resistant cores. Styles vary, but the perimeters of most wear-resistant cores are designed with hard facing or carbide inserts to resist abrasion.
- If noise must be reduced as much as possible, consider using hydraulic power and sound-dampened diamond blades. Sound-dampened blades are said to reduce noise by up to 10 decibels. Different designs of these blades are available. One has a vibration-dampening copper foil sandwiched between two steel disks.



Diamond blades are made by brazing diamond segments to the perimeter of a steel disk.



Each diamond segment consists of several diamond particles held together by a metal bond. To make segments that will cut different types of concrete, manufacturers vary the composition of this metal bond and the type, size, and concentration of diamonds.

Another has a steel core with a circular recess machined into one face. Spot-welded to the inside of this recess is a sound-dampening ring of low-alloy, unhardened steel. Sound created using normal blades can be reduced, too, by placing sound insulation inside and outside the blade guard or by placing special resilient disks between the blade and the flanges that hold the blade on the spindle. Using resilient disks that are not designed or installed properly can be dangerous, however.

Follow good practice

- Mark proposed saw cuts with a chalk line.

- Without forcing it, allow a new blade to sharpen itself on the material to be cut.
- Turn water on before the blade contacts the concrete and maintain adequate flow at all times. Usually, two to five gallons of water are needed per minute to cool the blade. If you run out of water, stop cutting. Make sure water is directed to both sides of the blade. Don't drive equipment over water hoses.
- Maintain a steady, even feed pressure. Avoid twisting the blade in the cut and never force it beyond its cutting capacity. If it's forced, it will become polished, stop cutting, and may become distorted. Don't let the blade spin in the cut either. This practice is called babying or sandbagging the blade. It increases wear on the bond, causing diamonds to pop out before they've done much work.
- Don't stand at the side or in front of the blade while the machine is operating. Wear safety glasses, hearing protection, hard hat, and safety shoes. Dry-cutting operators should also wear respirators.
- Use wedges to keep deep saw cuts open wider than the kerf of the blade. Without wedges, the concrete will tend to pinch the blade inside the cut.
- When cutting pavement or slabs on grade, adjust the cutting depth so that the blade does not cut into the subbase. Abrasive particles from the subbase will cause undercutting of the blade.
- When cutting on a slope, use leveling planks or reverse the blade frequently to equalize the effect of one-sided undercutting.
- You can always cool a dry-cutting diamond blade that is overheating by pulling it out of the cut. However, some blade cores become permanently damaged by the heat. Return dry blades with

heat-damaged cores to the manufacturer.

Maintain equipment

- Keep equipment in good shape. Loose belts, worn bearings, or worn spindles can drastically affect blade life. Keep the spindle aligned and the spindle nut tightened. Check the speed of the spindle with a tachometer to ensure the blade is running at the manufacturer's recommended cutting speed. If the blade does not run at its tensioned speed, it won't cut straight.
- Examine the blade periodically for improper wear. Don't remount a used diamond blade without first inspecting for undercutting, core fatigue, flatness, arbor hole damage, and segment damage or loss. Never use blades with cracked cores. Don't force a blade onto a spindle that's too large or mount it on a spindle that's too small. If a blade is removed, always put it back on the machine so that it rotates in the same direction as it did before. If not, blade life will be shortened.
- Use flanges (parts that hold the blade on the spindle) that are the same diameter and the recommended size. Keep them clean and replace them if they become bent or deformed.
- Make sure the pin hole of the blade is slid over the saw's drive pin. But never depend on the drive pin to actually drive the blade. It's simply a safety device that prevents the blade from spinning on the spindle if the spindle nut becomes loose.
- Make sure the wheels and blade shaft of a flat saw are properly aligned; undercutting may occur if they are not.

Editor's note

For more information about cutting with diamond saws read the following articles published in *Concrete Con-*

struction. Photocopies of these articles may be ordered for \$1.00 each, prepaid, from the Book and Reprint Division, Concrete Construction Publications, Inc., 426 South Westgate, Addison, Illinois 60101.

"Bits and Blades: What Makes Them Cut Faster and Last Longer," September 1985, pages 753-761.

"Concrete Saws and Drills: What Can They Do? When Are They Useful?" September 1985, pages 741-751.

"Sawing and Drilling Achievements," January 1982, pages 81-84.

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