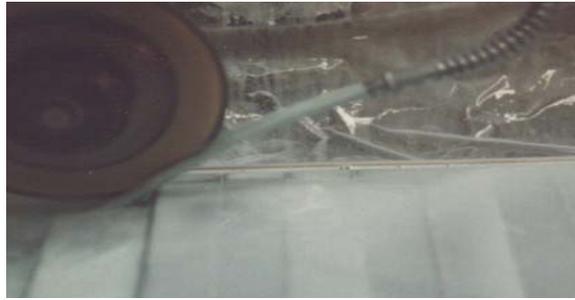


SAWING RECOMMENDATIONS



In order for you to get the most out of your new **Diamond Blade**, we strongly urge you to read and follow these instructions and suggestions. Doing so will help you save money and time. These suggestions and recommendations have come from years of experience in research, development and manufacturing of precision diamond products. As well as years of personal experience and observations of users like you.

Before Cutting

Visually examine diamond blade for cracks or any other damage. Do not use if damage is suspected. Damaged, incorrectly mounted, or misused blades can be very dangerous to use. Always wear proper safety equipment: Safety footwear, snug fitting clothing, safety goggles, hearing and head protection, and proper respiratory equipment. **Make sure to check the diamond blade for run out.**

If for some reason you feel there is a manufacturing defect, please return the blade where it was purchased with a note explaining the difficulty. Defective blades will be repaired or replaced. Blades improperly used will be repaired or replaced at users expense.

Before Installation

The following recommendations are given so that best results may be obtained in using diamond wheels:

Inspection

Visually examine blade for cracks or any other damage. Do not use if damage is suspected. Damaged, incorrectly mounted, or misused blades can be very dangerous to use.

Mounting

Care should be taken in mounting a diamond wheel. Flanges, back plates and spindle should be clean, free of burs, and run true. By using

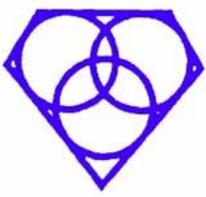
tapping lightly on a wood block held against the wheel, make sure the wheel is within .005. of true rotation. Tighten the flanges securely and recheck with an indicator before using. The use of permanent mounting should be practice where convenient. Please check the shaft of your machine for looseness that may indicate worn bearings. Also, check shaft for wear on the shaft itself. Blade should fit snugly.

Flanges

A pair of same size **flanges with proper relief** should be approximately **1/3 the diameter of the blade**. Flanges must be free of rust and dirt. Your blade should turn perfectly true after flange nut is tightened. Carriage alignment must be accurate for deeper cuts to prevent blade bending. Do not use blades that rattle or wobble on the saw. Flange diameter affects directional stability of the diamond wheel. For **ultra thin Diamond Wheels, your flange size must be 3/4 outside diameter of the blade**. Often extending right up to the diamond section. As a general rule of thumb, the largest possible flange diameter should always to be used.

Safety

Always wear proper safety equipment: Safety footwear, snug fitting clothing, safety goggles, hearing and head protection, and proper respiratory equipment. Always use blade guards provided on machines. Do not remove these safety devices. They are for your protection.



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Before Using

Make sure that the arrow on wheel point in the same direction as shaft rotation. Best performance and life will result. Before performing any cutting operations, let the tool run for a few seconds without load. If blade wobbles, vibration or unusual noise occurs, stop the tool immediately. Inspect blade for damage or incorrect mounting.

Securing your material while cutting

It is extremely important that the part you are cutting is clamped down and hold securely in place. So material does not move, if material does move while cutting it may break the diamond section of your blade. A clamp should be used for this purpose. **Do not hold the part (material) with your hands.** Doing so is dangerous, and your material will chip.

Cutting Speeds

RPM's will vary depending on the OD (Outside Diameter) of the blade and material to be cut. To improve blade life and help reduce wreckage, it is important to run blades at the proper RPM's and keep the diamonds exposed through dressing. Most blades should be operated in the range of 3,150 to 5,000 surface feet per minute. For soft, abrasive materials, RPM should increase. For hard, dense materials, RPM should decrease.

Blade Diameter	Recommended RPM	Blade Diameter	Recommended RPM
4"	4,000	18"	1,000
6"	2,675	20"	900
8"	2,000	22"	825
10"	1,600	24"	700
12"	1,325	30"	550
14"	1,140	36"	500
16"	1,000		

Faster cutting may reduce your working time slightly. However, the major trade off is a significant increase in friction and blade heat up, considerably reducing blade life and increasing the risk of heat fractures and breakage.

Meaning if a diamond blade develops dark "burn" marks at the diamond section, the blade is being used is too fast or the amount of pressure is too great. Reduce cutting speed or adjust pressure accordingly. It is generally recommended that you use a blade as fast as it will cut freely.

Sawing with Coolant

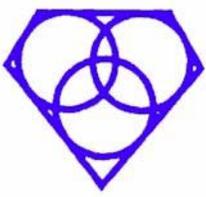


Coolant should always be used to cool and lubricate the blade. Most frequent source for diamond blade damage is cutting without enough coolant. It has been found that **generous flow of coolant** increases diamond blade efficiency, improves surface finish and reduces heat build-up and material cracks and deformation associated with overheating. Water is most often used coolant, providing excellent performance at minimal cost. Coolant must be applied in the proper place or it will not cool the blade or material being worked on properly. Coolant should always be directed so that the full flow is at the point of contact between blade and material, facing the same direction as rotation of the blade. The **amount of coolant used should increase with the hardness of the material being cut.** If you see sparks, there is insufficient coolant reaching the cutting zone or its simply ineffective.

Never run a diamond blade dry. Severe damage will result. Coolants do 3 things:

- a.) cool blade and material being cut
- b.) clean out abrasive particles formed while cutting
- c.) provide lubrication to keep cutting edge clean

When cutting in harder materials such as granite, agate, quartz, porcelain, or very hard materials like sapphire and alumina, it is important to have lots of coolant.



Determine the type of coolant you are planning to use. If you are planning to use water as a coolant, check with the blade manufacturer on what type of water recommended for your blade. City water with 90 psi or running water is usually used for cutting. For some applications, you may want to use an additive with your coolant. If you decide to go this route, you will need a circulating system and the right ratio between your additive and coolant.

UKAM Industrial Superhard Tools diamond wheels are designed to give you a straight cut in plain water. Although better performance and longer life in some cases may be obtained by using a [water soluble coolant](#).

Diamond Blade Dressing & Truing

Feed material slowly into blade so the blade does not lead off. Excessive pressure can cause your wheel to bend or dish. Feed rate should never be so great that blade slows down. A diamond blade may occasionally require dressing with a [dressing stick](#) made specifically for this purpose. Use coolant for this procedure. The **SMART CUT™** Diamond Bond is designed to minimize this procedure. By using enough coolant and following suggested procedures you can rest assured this will require a minimum amount of time as compared to most blades.

Most Diamond Blades can be [dressed](#) (retrued) several times. Usually the wear on the diamond blade depth takes place on the Blade core and diamond section. Dressing causes diamonds to be pulled out from the blade diamond section (diamond part). For this reason, great care should be taken to reduce this effect. We suggest reexposing the diamond section with a Al₂O₃ (alumina oxide) stick after retruing. This is a very simple operation: just cut into the dressing stick many times.

Applying Pressure to a Blade

When using diamond blades, it is very important to apply light to medium pressure. Gradually feeding blade it into material, until it begins to cut at its own speed.

Increasing pressure on the blade will do little towards reducing the time it takes you to complete a job. But will cause your blade to overload and overheat. This causes not only blade overheat (burn up), but it also heats up the material being cut, causing unwanted material cracks and deformation. If you can see dark “burn” marks around the diamond section, the cutting speed you are using is too fast or you are applying too much pressure.

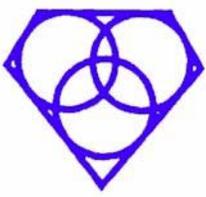
When cutting completely through a piece of material and the cut is near completion, reduce pressure on your blade considerably. Doing so will reduce and minimize back and front side chipping. **Never force a diamond blade.**

Balancing Cutting Speed, Pressure and Coolant

Cutting speeds are affected by the hardness and abrasiveness of the material, age and condition of equipment, pressure and coolant. Experience with a specific material and applications allows the operator to develop the right cutting process for their particular application, and taking into account all of the factors discussed above. New users, who are just beginning to use diamond blades, are better using **thicker kerf blades**, applying lower speeds, lower pressure, and a large amount of coolant. Until they are able to build their experience using a specific diamond blade, set up, and application. Doing so will minimize the risk of diamond blade wreckage and material damage.

Cutting Depth

Most frequent source of diamond blade damage is attempting to cut too large piece of material. Maximum material size should not be more than 3/8" blade diameter.



Thin Kerf / Ultra Thin Diamond Blades

Thin Kerf / Ultra thin blades Are used for to obtain more precision tolerances, faster cutting speed, and minimize loss of valuable material. Thinner blades provide less resistance against and impact against material, and can thus be operated at significantly more higher speeds. Including ultra hard & expensive materials minimum loss of material counts the most. Thinner blades will provide a smoother surface finish, faster cutting, greater cutting accuracy, minimize material loss and deformation.

Diamond Blade Maintenance

Proper Diamond Blade maintenance is very important for optimum cutting performance. Maintaining the diamond cutting edge shape, and rigidity is important to prevent the blade from loosing its sharpness and roundness.

When to replace a Diamond Blade

Diamond Blades that are:

a.) Dished b.) Bent c.) Not running true

should be replaced. If your diamond blade has a tendency to pull to one side, making uneven cuts. Reverse the blade, and try cutting again. If you still have the same problem, it could be your vise alignment. If after reversing the blade still cuts to opposite side. It may be bent or dished. Should this be the case, the blade must be repaired or replaced before further use. **Never continue cutting with a damaged Diamond Blade.**

Do's

1. Always inspect flanges for burrs, warpage, cleanliness and flatness.
2. Check blades carefully before each use for proper alignment and possible defects.

3. Maintain a firm grip on blade during cutting operation
4. Keep bystanders and/or animals out of working area.
5. Make sure all Diamond Blade users comply with safety regulations. For use, see safety codes USA-ANSIB71 and OSHA regulations. Canada - CSA.

Don't

1. Do not alter (change) blade inside diameter (ID). Doing so will create unbalanced blade rotation and result in blade wobbling, pounding, or cracking witch could be hazardous.
2. Do not stand in line with blade and stream of hot particles.
3. Do not force a Diamond Blade. Most diamond blades are designed for straight line cutting only. Cutting curves can cause stress cracks or fragmentation of the blade. Resulting in possible injury to people in vicinity.
4. Do not use side pressure or grind with side of the blade.

WARNING:

Diamond Blades improperly used are dangerous. Comply with American National Standards institute Safety Code B71 and Occupational Safety and Health Act Covering SPEED - SAFETY - GUARDS - FLANGES - MOUNTING PROCEDURES - GENERAL INSPECTION - GENERAL MACHINE CONDITIONS.

WARNING:

Sawing generates dust. Excessive airborne particles may cause irritation to eyes, skin and respiratory tract. To avoid breathing impairment always employ dust controls and protection sutable to the material being drilled. In accordance with OSHA (29 CFR 1910, 1200).