



Overview

Diamond blades do not really cut. They grind material through friction with the synthetic diamond-bonding matrix. The diamond crystals, often visible at the leading edge and sides of the rim/segment, remove material by scratching out particles of hard, dense materials, or by knocking out larger particles of loosely bonded abrasive material. This process eventually cracks or fractures the diamond particle, breaking it down into smaller pieces. As a result of this phenomenon, a diamond blade for cutting soft, abrasive material must have a hard metal matrix composition to resist this erosion long enough for the exposed diamonds to be properly utilized. Conversely, a blade for cutting a hard, non-abrasive material must have a soft bond to ensure that it will erode and expose the diamonds embedded in the matrix. These simple principles are the foundation of "controlled bond erosion." These blades are available in the following diameters: 4", 4-1/2", 7", 12" and 14".

Features/Benefits

In general, a diamond blade's performance is measured in two ways: first, how proficiently the blade grinds through the material and second, the life of the blade or total footage yielded by the blade.

Diamond Blades vs Abrasive Blades

(concrete cutting capacity of one blade 1" deep)

Abrasive Blade:  16"

Diamond Blade:  1,630"

Each blade is meticulously engineered to provide cutability, longevity and safety.

When you select the dry diamond blade best-suited for the job, application or material, you ensure peak performance and maximum investment return. Water can be used to help cool the blade and reduce dust.

Applications

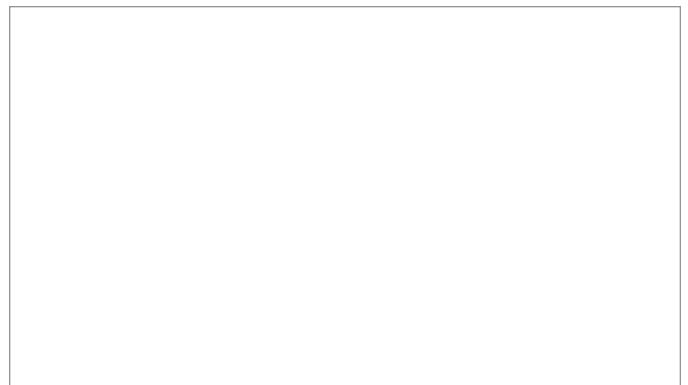
Diamond blades are typically used in hard or abrasive materials where a steel blade or even carbide would have difficulty.

Glass	Composites	Concrete	Cinder Block
Brick	Masonry	Ceramics	Stucco
Slate	Tile	Stone	Asphalt

Which Diamond Saw Blade is right for my application?

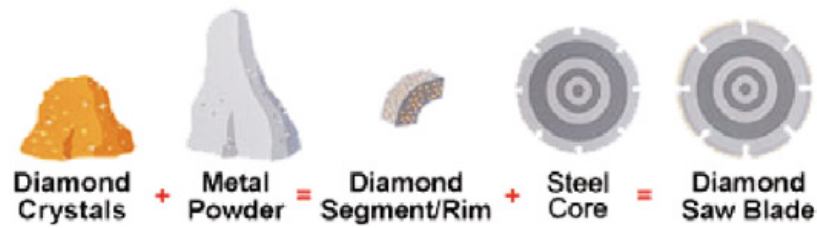
Dry Cutting Diamond blades are offered in two styles: segmented rim or continuous rim.

- Continuous Rim Blades: Typically chosen when cutting tile, or for other applications where a clean cut is desired. Examples include ceramic tile and brick.
- Segmented Rim Blades: Chosen when a fast cut is desired and the material is extremely abrasive and difficult to cut, or when a deep cut is required. Examples include asphalt and concrete.



Composition

Diamond blades consist of four components: diamond crystals, a bonding system, a segment and a metal core.



Diamond Crystals

The diamond crystals in Lawson's blades are synthetic (man-made) rather than natural. This gives them a consistency that can be relied upon during the enormous stresses they encounter while grinding. The foremost performance factor in diamond-blade sawing is the type, concentration and size of these diamond crystals.

Bonding Matrix

Diamond crystals are held in place by a sintering process of specially blended metal powders. This bonding matrix is crucial to the overall performance of Lawson's diamond blades and serves several vital functions:

- Disperses and supports the diamonds
- Provides controlled wear while allowing diamond protrusion
- Prevents diamond "pull-out"
- Acts as a heat sink
- Distributes impact and load as the diamond attacks the cutting surface

During the sawing action, the wearing away of the matrix exposes new diamond crystals, providing fresh cutting points for the blade.

Metal Bonds

The diamond crystals and bonding matrix are heated and shaped into specially engineered rims/segments. These rims/segments are wider than the blade core to which they will be attached and provide the clearance to promote material discharge and discourage blade binding. The rims/segments are specifically designed to wear at a rate appropriate to the material being cut.

Large particles of soft abrasive materials wear down the matrix faster than the small particles removed from hard dense materials. Therefore, softer, more abrasive materials require a "tough to wear" (hard) bond; less abrasive materials require an "easy wear" (soft) bond.

Premium Steel Core

The diamond saw blade cores are made from high alloy, heat-treated steel. Depending on the type of blade selected, the steel cores are specifically designed to support the appropriate rim or segment.

The various rims/segments are affixed through a brazing or laser welding process around the periphery of the core. An arbor hole is precisely bored in the center, and the entire core is "tensioned" or tuned so that the stresses of centripetal force are minimized, permitting the blade to spin true on the spindle.

Troubleshooting

Blade Worn Out of Round

Cause – Shaft bearings are worn (masonry and concrete).

Remedy – Install new blade shaft bearings or blade shaft, as required.

Cause – Engine is not properly tuned on concrete saws, causing surges in blade rotation.

Remedy – Tune engine according to manufacturers' manual.

Cause – Blade arbor hole is damaged from previous mismounting.

Remedy – Replace worn shaft or mounting arbor bushing. Bond is too hard for material, causing a “rounding” and wearing one half of the blade more than the other. Make certain that the drive pin is functioning. Use proper blade specification.

Blade Will Not Cut

Cause – Blade is too hard for material being cut.

Remedy – Use a softer bonded blade. Select proper blade specification for material being cut.

Cause – Blade has become dull as a result of being used on material which is too hard.

Remedy – Improper blade specification; blade is too hard for the material being cut.
Use a softer bonded blade to reduce operating stresses.

Cause – “Dull” blade

Remedy – “Open” blade by dressing segment on abrasive block.



Uneven Segment Wear

Cause – Equipment defects cause the segments to wear unevenly.

Remedy – Replace bad bearings, worn arbor shaft or correct misalignment to spindle.
Concrete saws, engine must run smoothly to prevent harmonic vibration.

Cause – Saw is misaligned.

Remedy – Check saw head alignment for vertical and horizontal squareness.

Arbor Hole Out-of-Round

Cause – Blade collar is not properly tightened, permitting blade rotation or vibration on the shaft.

Remedy – Tighten the shaft nut with a wrench to make certain that the blade is adequately secured.

Cause – Blade collars are worn or dirty, not allowing proper blade clamping.

Remedy – Clean blade collars, making sure they are not worn.

Cause – Blade is not properly mounted.

Remedy – Make certain the blade is mounted on the proper shaft diameter before tightening shaft nut. Ensure the pin hole slides over drive pin. Make sure that the drive pin is in pin hole.

Cause – Loose belt on saw.

Remedy – Tighten belts. Check to see if arbor on saw is running true.



Segment Cracks

Cause – Blade is too hard for material being cut.

Remedy – Use a blade with a softer bond.

Cause – Blade being “forced” through the cut causing chattering.

Remedy – Run saw at normal speed. “Open” blade by resharpener in abrasive material.

Troubleshooting (cont.)

Blade Wobbles

Cause – Blade running at improper speed.

Remedy – Check for bad bearings, bent shaft or worn mounting arbor. Speed of the saw is either too fast or too slow for the size of the blade: RPM of the saw should be verified to the specific speeds established by the NASI Standards for minimum and maximum blade speeds; make certain that blade shaft is running at recommended RPM to match tensioned speed of blade. Should the blade continue to wobble after verification of the saw RPM, then the blade should be returned to the manufacturer to be re-tensioned and flattened.

Cause – Blade collar diameters are not identical.

Remedy – Check blade collar discs to make sure they are clean, flat and the correct diameter.

Cause – Blade is bent as a result of dropping or being twisted in the cut during operation.

Remedy – Blade should be returned to the manufacturer to be re-tensioned and flattened.



Segment Loss

Cause – Defective blade collars are causing blade misalignment.

Remedy – Clean blade collars or replace if collars are under recommended diameter.

Cause – Blade is too hard for material being cut.

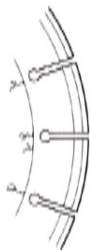
Remedy – Use proper blade specification for material being cut.

Cause – Blade is cutting out of round, causing a pounding motion.

Remedy – Replace worn bearings, realign blade shaft or replace worn blade mounting arbor.

Cause – Improper blade tension.

Remedy – Ensure blade is running at the proper RPM and blade is tensioned correctly. Tune engine according to manufacturers' manual.



Cracks in Steel Center

Cause – Blade flutters in cut as a result of blade losing tension.

Remedy – Tighten the blade shaft nut. Make sure blade is running at proper tensioned speed and that the drive pin is functioning properly.

Cause – Blade specification is too hard for the material being cut.

Remedy – Use a softer blade bond to eliminate stresses that create cracks.

Cause – Bad blade shaft bearing.

Remedy – Replace blade shaft bearing.

Cause – Blade is overheating.

Remedy – Check feed rate and cutting speed. Allow blade to cool between cuts.



Loss of Tension

Cause – Steel center has been overheating as a result of blade spinning on arbor.

Remedy – Check water flow, distribution and lines. Tighten the blade shaft nut. Make certain the drive pin is functioning (on concrete saws).

Cause – Steel center has been overheating from rubbing the side of material being cut.

Remedy – Make certain blade RPM is correct so the blade operates at its tensioned speed. Tune engine according to manufacturers' manual.

Cause – Unequal pressure at blade clamping collars.

Remedy – Blade clamping collars must be identical in diameter and the recommended size.

Cause – Blade bond or matrix is too soft.

Remedy – Use a harder matrix blade.

Cause – Blade is overheating.

Remedy – Check feed rate and cutting speed. Allow blade to cool between cuts.