WE'RE EXPERTS IN DIAMOND TOOLS – SO YOU DON'T HAVE TO BE

Husqvarna is one of the world's leading developers and manufacturers of diamond tools for cutting and drilling in concrete and other construction materials. We supply millions of diamond tools – saw blades, drill bits, wires and grinding tools – to professional contractors, craftsmen and rental companies all over the world. A Husqvarna diamond tool is always a safe choice. If you're not sure which tool to pick for a specific job, just follow our recommendation charts at the beginning of each diamond tool section or consult your Husqvarna sales contact.

BLADE QUALITY LEVELS

GOLD

Husqvarna Gold level diamond tools are developed for specialist contractors. Made for intensive professional use in specialist applications. Provide maximum cutting speed and wear resistance in heavy cutting, grinding and drilling.

SILVER

Husqvarna Silver level diamond tools are developed for general contractors. Made for professional use in all-round applications. Provide high cutting speed and wear resistance in all cutting, grinding and drilling.

BRONZE

Husqvarna Bronze level diamond tools are developed for occasional users. Made to provide a good balance between performance and price in all common cutting and drilling applications.

HOW TO READ BLADE PACKAGING

Smarter features

Blade quality level

Label material identifier

Secondary material identifier

Larger cut-out for segment visibility

Blade size

5 STEPS FOR SELECTING THE RIGHT DIAMOND BLADE

1. WHAT MATERIAL ARE YOU CUTTING?

Correctly identifying the material to be cut directly affects the cutting speed and the life of the blade. Most blades are designed to cut a range of materials, which is limited by the hardness of the bond and the diamond quality used. However, for maximum performance, the blade should be matched as closely as possible to the material it will cut.

2. WHAT TYPE OF EQUIPMENT ARE YOU USING?

Knowing if you will be using a 5 hp power cutter or a 70 hp flat saw will impact blade choice dramatically. The size of the blade acceptable to use on the saw, the ability to use a wet or dry blade and the rpms needed to spin the blade all depend on the equipment.

3. HOW DEEP ARE YOU CUTTING?

Knowing how deep you need to cut on a particular job will help you select the right blade diameter. Maximum cutting depths listed on blade packaging may vary from what it actually cuts in the field. Actual cutting depth will vary with the exact blade diameter or saw type or the exact diameter of the blade collars (flanges). Cutting depth will also be reduced if saw components (motor housing and blade guard) extend below the blade collars.

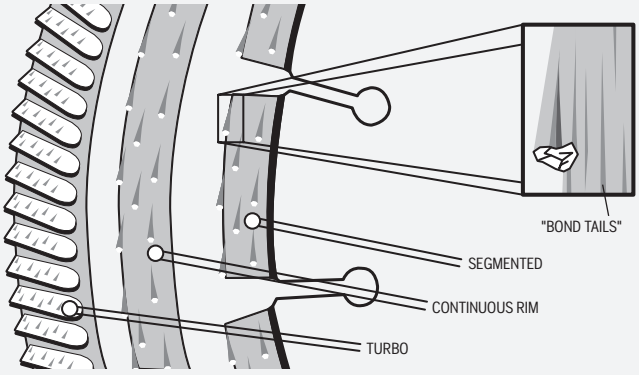
4. ARE YOU CUTTING DRY OR WET?

Knowing whether or not you will have or need a water source on a job is important when selecting a diamond blade. Blades designed to cut dry can also cut equally well wet, but wet cutting blades absolutely must be used with water.

5. DO YOU WANT MORE LIFE OR SPEED?

Which is more important: the initial price of the blade or the cost per cut? It may be more cost effective to purchase a low-priced blade for a smaller job or occasional use. For larger jobs or more regular use, a higher priced blade will actually be less expensive to use because it will deliver the lowest cost per cut.

What is a Diamond Blade?



A diamond blade is a circular steel disc with a diamond bearing edge. The edge can have one of three configurations: segmented, continuous rim or turbo.

The blade core is a precision-made, steel disc which may have slots. The slots (also called "gullets") provide faster cooling by allowing water or air to flow between the segments. The slots also allow the blade to flex under cutting pressure.

Most blade cores are tensioned at the factory so the blade will run straight at proper cutting speeds. Proper tension also allows the blade to remain flexible enough to bend slightly under cutting pressure and "snap" back into position. Diamond segments or rims are made up of a mixture of diamonds and metal powders. Diamonds used in blades are almost exclusively manufactured diamonds, in various grit sizes and quality grades.

In the manufacturing process, the metal powder and diamond grit mixture is hot pressed at high temperatures to form a solid metal alloy (called the bond or matrix) in which the diamond grit is retained.

The segment or rim is slightly wider than the blade core. This side clearance allows the cutting edge to penetrate through the material without steel drag.

To attach the diamond rim or segments securely to the steel core, several different processes, brazing, laser welding or a diffusion bond are used.

1. BRAZING
Silver solder is placed between the segment or rim and the core. At high temperatures, the solder melts and bonds the two parts together.

2. LASER WELDING
The diamond segment and steel blade core are welded (fused) together by a laser beam.

3. DIFFUSION BOND
Mechanical bond process guaranteed for normal useful life of the blade.

HOW DO DIAMOND BLADES WORK?

Diamond blades do not really "cut" like a knife...they grind. During the manufacturing process, individual diamond crystals are exposed on the outside edge and sides of the diamond segments or rim. These exposed surface diamonds do the grinding work. The metal "matrix" locks each diamond in place. Trailing behind each exposed diamond is a "bond tail" which helps support the diamond.

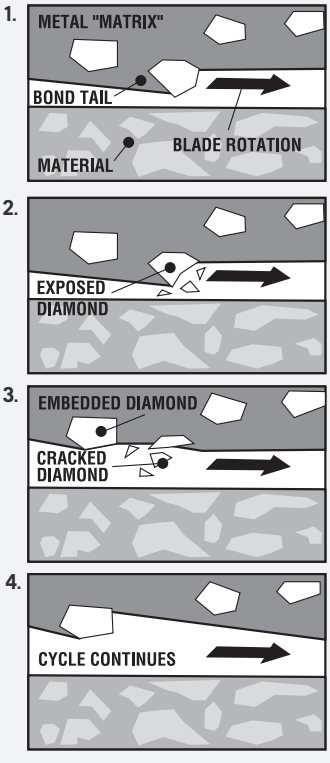
While the blade rotates on the arbor shaft of the saw, the operator pushes the blade into the material. The blade begins to cut through the material, while the material begins wearing away the blade.

Exposed surface diamonds score the material, grinding it into a fine powder. Embedded diamonds remain beneath the surface.

Exposed diamonds crack or fracture as they cut, breaking down into even smaller pieces. Hard, dense materials cause the diamonds to fracture even faster.

The material also begins to wear away the metal matrix through abrasion. Highly abrasive materials will cause the matrix to wear faster, allowing new layers of diamond exposure to continue cutting.

This continuous grinding and wearing process continues until the blade is "worn out." Sometimes a small, unusable part of the segments or rim may remain. It is important to understand that the diamond blade and the material must work together (or interact) for the blade to cut effectively.



In order for a diamond blade to work properly, the diamond type, quality and grit size must be suited for the saw and the material. The metal matrix must also be matched to the material to be cut.

Blades for cutting hard, dense (less abrasive) materials (such as tile, hard brick, stone or hard-cured concrete) require a softer metal matrix. The softer metal matrix wears faster, replacing worn-out diamonds fast enough for the blade to keep cutting

Blades for cutting soft, abrasive materials (such as block, green concrete or asphalt) must have a hard metal matrix to resist abrasion and hold the diamonds longer.

How to Select the Right Diamond Blade?

BEFORE YOU GET STARTED

Decide which is most important: the initial price of the blade or the cost per cut. For smaller jobs or occasional use, a low priced blade may be preferable. For larger jobs or regular use, a higher priced blade will actually be less expensive to use because it will deliver the lowest cost per cut. For really big jobs, the lowest possible sawing cost (cost per foot) is usually much more important than the initial price. Husqvarna has a grading system to help you identify the different performance levels of blades.

KNOW THE TYPE AND HORSEPOWER OF THE SAW BEING USED

A list of different types of equipment to use diamond blades on is provided on page 6. There is a corresponding symbol for each, and these symbols are used throughout the catalog to help locate the right blade. Blades that are to be used on power cutters have to be rated at higher rpms. Please refer to the chart on page 264. All Husqvarna high-speed cut-off blades are rated at the appropriate, higher rpms.

CORRECTLY IDENTIFY WHAT YOU ARE CUTTING

Correctly identifying the material to be cut is the most important factor in choosing a blade. It directly affects the cutting speed and the life of the blade. Diamond blade recommendation charts are found throughout the catalog to help locate the proper blade. Most Husqvarna blades cut a range of materials. For maximum performance (cutting speed and life), the material should be matched to the blade as closely as possible. As a general rule, determine the material which will be cut most often, or the material for which top blade performance is most important.

CHOOSE WET OR DRY CUTTING

Choosing wet or dry may be a matter of user preference or job requirement. When using a power hand tool such as a power hand saw, it is not safe to use water because of the electrical power source. However for concrete saws, wet cutting is usually preferred because you can cut deeper when using water as a coolant. For tile and masonry saws, either wet or dry cutting blades can be used. For power cutters, dry blades are more popular, but they are often used wet to control dust. Wet blades MUST be used with water. Dry blades may be used EITHER dry OR wet, as the job or equipment allows.

THE SIGNIFICANCE OF SEGMENT HEIGHT

Total segment heights may be misleading because of non-diamond bearing segment bases necessary for the laser welding or brazing process. That is why Husqvarna shows you exactly how much of each segment has diamonds and can actually be used to cut. Diamond blade segment height by itself is not a true measure of a blade's value. Many other factors affect a blade's performance and consequent value. Consider the diamond size, concentration and quality, the hardness of the bond, the cutting power (torque) of the saw, and how well the blade specification is matched to the material being cut.

FACTORS INVOLVING CONCRETE

When cutting concrete, several factors influence which diamond blades to choose. These include:

- Compressive strength
- Hardness of the aggregate
- Size of the aggregate
- Abrasivity of the aggregate
- Type of sand
- Steel reinforcing (rebar)
- Green or cured concrete

The guidelines in this section are for general reference only. The best source for information on the characteristics of the concrete to cut is from the original contractor. Contact your local Department of Transportation or City Hall for help in finding this information.

COMPRESSIVE STRENGTH

Concrete slabs may vary greatly in compressive strength, measured in pounds per square inch (PSI). Most concrete roads are 4,000-6,000 PSI, while typical patios or sidewalks are about 3,000 PSI.

Concrete Hardness	PSI
Critically hard	8,000 or more
Hard	5,000 - 8,000
Medium	4,000 - 6,000
Soft	3,000 or less

Diamond Blade Performance

SIZE OF THE AGGREGATE

The size of aggregate affects diamond blade performance. Large aggregates tend to make a blade cut slower. Smaller aggregates tend to make a blade cut faster. The most common sizes of aggregate are:

Pea Gravel.....Variable in size, usually 3/8" or less in diameter
3/4".....Sieved size
1-1/2".....Sieved size

HARDNESS OF THE AGGREGATE

There are many different types of rock used as aggregate. Hardness often varies even within the same classification of rock. For example, granite varies in hardness and friability. The Mohs Scale is frequently used to measure hardness. Values of hardness are assigned from one to ten. A substance with a higher Mohs number scratches a substance with a lower number - higher Mohs Scale numbers indicate harder materials.

The scale below shows the Mohs scale range. Aggregate hardness is one important factor when cutting concrete. Because hard aggregate dulls diamond grit more quickly, segment bonds generally need to be softer when cutting hard aggregate. This allows the segment to wear normally and bring new, sharp diamond grit to the surface. Softer aggregate will not dull diamond grit as quickly, so harder segment bonds are needed to hold the diamonds in place long enough to use their full potential. Most aggregates fall into the 2 to 9 range on the Mohs scale.

HARDNESS OF THE AGGREGATE CONTINUED

Scores of commonly used aggregates.

Mohs Scale	
1 - Talc	6 - Feldspar
2 - Gypsum	7 - Quartz ($Si O_2$)
3 - Calcite	8 - Topaz
4 - Fluorite	9 - Corundum ($Al_2 O_3$)
5 - Apatite	10 - Diamond

Mohs Range	Description	Aggregates
8-9	Critically hard	Flint, chert, trap rock, basalt
6-7	Hard	Some river rock, some granites, basalt, quartz, trap rock
4-5	Medium hard	Some granites, some river rock
3-4	Medium	Dense limestone, sandstone, dolomite, marble
2-3	Medium soft	Soft limestone

TYPE OF SAND

Sand is part of the aggregate mix and determines the abrasiveness of concrete. ‘‘Small aggregate’’ is usually sand. Sand can either be sharp (abrasive) or round (non-abrasive). To determine the sharpness of sand, you need to know where the sand is from. Crushed sand and bank sand are usually sharp; river sand is usually round. Green concrete is more abrasive than cured concrete because when concrete is not fully cured, sand can easily be scraped off the surface being cut. More loose sand means more abrasiveness.

STEEL REBAR REINFORCING

Heavy steel reinforcing tends to make a blade cut slower. Less reinforcing tends to make a blade cut faster. Light to heavy rebar is a very subjective term.

Light Examples:
Wire mesh, single mat

Medium Examples:
#4 rebar, every 12" on center each way (OCEW), single mat, wire mesh, multi-mat

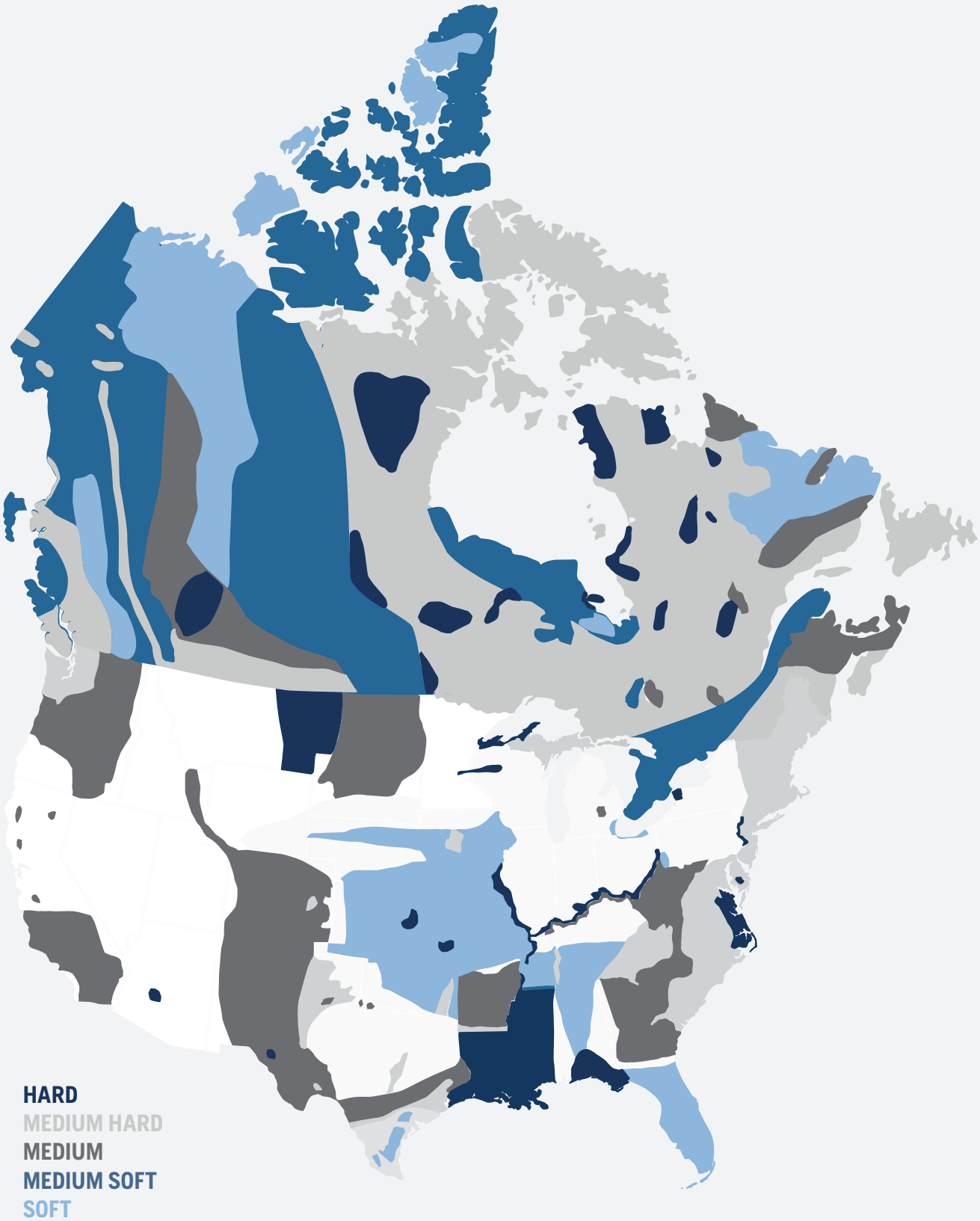
Heavy Examles:
#5 rebar, 12" OCEW, single mat | #4 rebar, 12" OCEW, double mat

Heavy rebar can also result from different grades of steel. Typical rebar is grade 40 steel. Grade 60 steel would make the example of #4 medium rebar, above, into a heavy rebar. Rebar gauges are in eighths of an inch - #4 rebar is 1/2" diameter, #5 is 5/8". Where rebar specifications do not exist on a road, pull a core sample before buying a blade.

GREEN OR CURED CONCRETE

The drying or curing time of concrete greatly affects how the material will interact with a diamond blade. Green concrete is freshly poured concrete that has set up but is not yet fully cured. It is softer and more abrasive than cured concrete. You need a harder bonded blade with undercut protection to cut green concrete. You need a softer bonded blade to cut the same concrete in a cured state. The definition of green concrete can vary widely. Weather, temperature, moisture in the aggregate, time of year and the amount of water in the mix all influence curing time. Concrete now has additives which can either shorten or extend curing time. Consult your mix design to find the relative curing time for your job. As soon as wet concrete sets up and does not spill or ravel, green cutting can begin.

Aggregate Map



Cutting Depths & Operating Speeds

Diameter (Inches)	Cutting Depth
Concrete Saw Blades	
7"	1-1/2"
8"	2"
12"	3-5/8"
14"	4-5/8"
16"	5-5/8"
18"	6-5/8"
20"	7-5/8"
24"	9-5/8"
26"	10-5/8"
30"	11-3/4"
36"	14-3/4"
42"	17-1/2"
48"	19-3/4"
Wall & Hand Saw Blades	
14"	4-5/8"
18"	6-1/2"
24"	9-1/2"
30"	11-1/2"
36"	14-1/2"
42"	17-1/2"
48"	20-3/4"

Diameter (Inches)	Cutting Depth
Masonry Saw Blades	
14"	5"
18"	7"
20"	8"
Tile Saw Blades	
4"	3/4"
4-1/2"	1"
5"	1-1/4"
6"	1-3/4"
7"	2-1/4"
8"	2-3/4"
9"	3-1/4"
10"	3-3/4"
Power Hand Saw Blades	
3-3/8"	1/2"
4"	1"
4-1/2"	1-1/4"
5"	1-1/2"
7"	2-1/2"
8"	3"
High-Speed Saw Blades	
12"	4"
14"	5"
16"	6"

Dia.	Recommended Operating Speed (RPM)*	Maximum Safe Speed (RPM)**
4"	9,072	15,000
4-1/2"	8,063	13,300
5"	7,257	12,000
6"	6,048	10,185
7"	5,184	8,730
8"	4,536	7,640
9"	4,032	6,790
10"	3,629	6,115
12"	3,024	5,095
12"HS†		6,300
14"	2,592	4,365
14"HS†		5,460
16"	2,268	3,820
16"HS†		4,725
18"	2,016	3,395
20"	1,814	3,055
22"	1,649	2,780
24"	1,512	2,550
26"	1,396	2,350
28"	1,296	2,185
30"	1,120	2,040
32"	1,134	1,910
36"	1,008	1,700
42"	864	1,455
48"	756	1,275

Note: Diamond blade cutting depths listed above are approximate. Actual cutting depth will vary with the exact blade diameter or saw type (or brand), or the exact diameter of the blade collars (flanges). Cutting depth will also be reduced if saw components (motor housing, blade guard) extend below the blade collars (flanges).

†HS is for high-speed diamond blades.

*Based on 9,500 sfpm (surface feet per min) – the general optimum performance range for cutting concrete and masonry products is +10%. For hard, dense materials such as stone and tile, the optimum performance speed is 10-25% less than the speeds shown above.Bladeshaft speeds (rpms at no load) for most tools will be higher than the recommended operating speeds shown above. Under normal sawing conditions, the actual bladeshaft speed of the tool will slow down under load, and should fall within the optimum speed range.

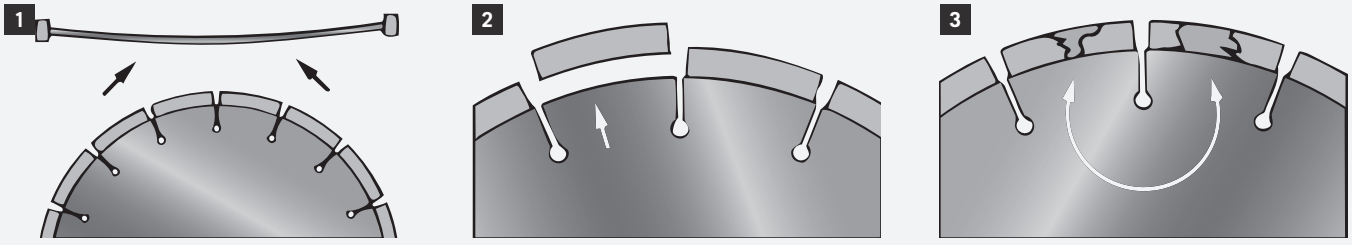
**This speed (rpm) represents the max safe speed [in revolutions per minute (rpm)] at which each blade can be used. Before using any blade, make sure the bladeshaft (arbor) speed or the tool is within the "maximum safe" limit of that blade.

Diamond Blade Trouble Shooting

Few Husqvarna diamond blade problems are caused by warranty failures - less than 1/10% (.001). Most problems result from:

- Using the wrong blade for the job
- Using the blade improperly
- Equipment problems

This trouble shooting guide will help identify, diagnose and correct diamond blade problems. The following are samples of some of the problems you may encounter in the field, with a cause and remedy guide to diagnose and correct these problems.



Loss of tension *Segment loss* *Cracked segment*

BLADE ISSUE 1) LOSS OF TENSION - blade does not stay straight while running, but wobbles

COULD BE CAUSED BY...	POTENTIAL REMEDY
Blade being used on misaligned saw.	Check for proper saw alignment.
Blade is excessively hard for the material being cut, creating stress on the steel center.	Double-check blade was made to cut the material. If not, select a new blade.
Utilizing blade flanges that are under size or not the same diameter, creating uneven pressure on the center.	Check that proper size and identical diameter flanges are being used. The blade collar diameter should be a minimum of 1/6" of the maximum diameter of blade.
Wrong RPMs.	Use the tachometer to ensure the bladeshaft is turning at the proper RPMs for the blade.
Blade improperly mounted on arbor shoulder and has become bent when flanges are tightened.	Hold the blade securely on the arbor shoulder until the outside flange and nut are firmly tightened.

BLADE ISSUE 2) SEGMENT LOSS - one of more segments fall off from the blade core

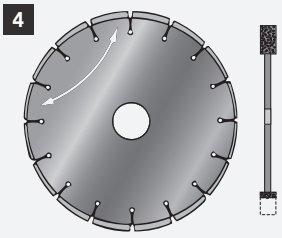
COULD BE CAUSED BY...	POTENTIAL REMEDY
Blade is too hard for the material it is cutting, which creates excessive dullness making the segment pound off or fatigue.	Switch to a softer bond blade.
Worn blade flanges fail to provide proper support and cause the blade to deflect.	Replace both blade flanges.
The material slips during cutting, which twists or jams the segment loose.	Make sure the material is secured and stable while cutting.
Out-of-round blade rotation results in pounding, caused by worn arbor or bad bearings in the shaft.	Replace worn arbor and/or bearings.
Overheating can usually be detected by blue color on steel center and generally confined to the area where the segment was lost.	Check the water system for adequate volume and for obstructions in the water system. For dry cutting, it may be necessary to make shallower cuts and allow the blade to run freely every few minutes in order to let the air cool it.

REPAIR NOTE: It is possible to replace two or three missing diamond segments, providing the steel center is not cracked or undercut badly. If many segments are missing, or if there is less than 50% of blade life remaining, repairing the diamond blade may not be economical. Be certain to eliminate mechanical or operational problems before installing replacement blades.

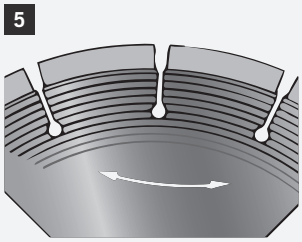
BLADE ISSUE 3) CRACKED SEGMENTS - cracks form in one or more segments

COULD BE CAUSED BY...	POTENTIAL REMEDY
Blade is too hard for the material it is cutting.	Switch to a softer bond blade.

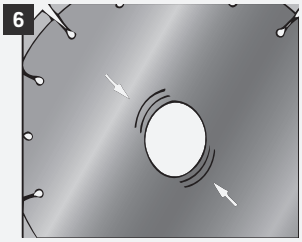
Diamond Blade Trouble Shooting



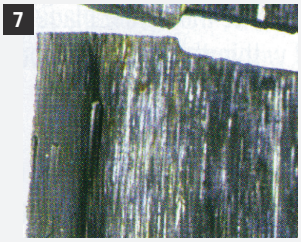
Eccentricity



Overheated Blade



Arbor hole out-of-round



Blade won't cut

BLADE ISSUE 4) ECCENTRICITY - blade is out-of round resulting in uneven wear rate of segments

COULD BE CAUSED BY...	POTENTIAL REMEDY
The bond is too hard for the material being cut. The hard bond retains the diamonds and they begin to round off, causing the blade to becoming dull.	Change to a softer bond, which will wear away more readily. This allows the dull diamonds to be released and the sharp, new cutting edges to become exposed.
The saw bladeshaft may have a groove scored in it, caused by a blade spinning between the flanges. A new blade, installed on the arbor shaft, will seat into the groove and immediately run eccentrically when the saw starts.	Replace the worn shaft.
If the bladeshaft bearings are worn, the shaft and mandrel will run eccentrically causing the blade to wear out-of-round. This happens most often with concrete saws when proper lubrication of the bearings is neglected.	Install new bladeshaft bearings. In some cases it might aslo be necessary to replace the bladeshaft if it is worn out of alignment.

BLADE ISSUE 5) OVERHEATED BLADE - blade comes hot

COULD BE CAUSED BY...	POTENTIAL REMEDY
Adequate coolant was not provided.	Check water supply for adequate volume and for obstructions in the water system. Use dry blades ONLY for shallow cutting (1-2" deep) or step cutting.

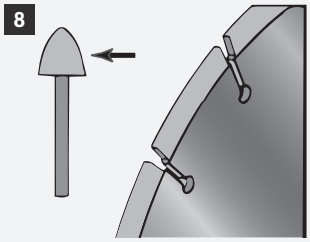
BLADE ISSUE 6) ARBOR HOLE OUT-OF-ROUND - arbor hole stretches so that it isn't a circle

COULD BE CAUSED BY...	POTENTIAL REMEDY
Saw arbor badly worn due to improperly seated blades	Before tightening flange, make sure blade is seated correctly (on arbor shoulder).
Blade flange not properly tightened permitting blade to rotate on the shaft.	Always wrench tighten the arbor nut. Never hand tighten. Always use hex nuts, never use wing nuts.
Blade flanges or arbor shaft worn and not providing proper blade support.	Check blade flanges or arbor shaft for damage or excessive wear. Both flanges should be no less than that recommended by the manufacturer. Replace worn parts.

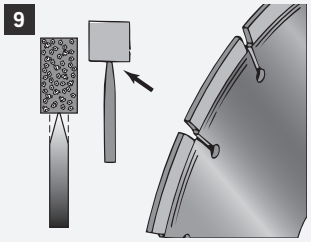
BLADE ISSUE 7) BLADE WON'T CUT - blade spins in the cut without cutting the material

COULD BE CAUSED BY...	POTENTIAL REMEDY
Blade is too hard for materials being cut (for example – block or general purpose blade being used for extended period on hard brick. Asphalt blade being used to cut hard concrete).	Consult dealer or manufacturer for proper blade to cut the materials.
Insufficient power to permit blade to cut properly.	Make sure belts are not loose, and saw is producing enough horsepower.
Blade has become dull because of continuous use on fairly hard or vitrified material.	Consult the diamond tool supplier or manufacturer.
Blade segments appear to still have plenty of life, but blade won't cut.	Some harder-bonded blades designed for abrasive materials require a non-diamond bearing section at the base of the diamond segment for better adherence to the steel core. A blade used to this stage has worn out in the normal manner and should be replaced.

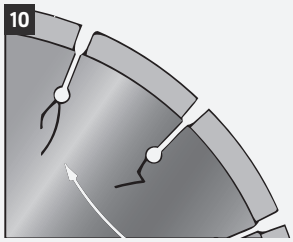
Diamond Blade Trouble Shooting



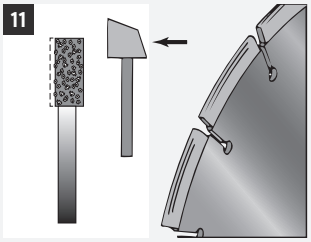
Excessive Wear



Undercutting



Cracked Core



Uneven Segment War

BLADE ISSUE 8) EXCESSIVE WEAR - segments are worn too quickly

COULD BE CAUSED BY...	POTENTIAL REMEDY
If diamonds are highly exposed, you could be using the wrong blade on highly abrasive material.	Consult dealer or manufacturer for the proper blade specification for abrasive material.
If diamonds are highly exposed, there could be a lack of sufficient coolant to the blade.	If saw is equipped with a water pump, make sure it is functioning properly. Check water supply at blade.
Wearing out-of-round accelerates wear. Usually this can be caused by bad bearings, worn shaft or using a blade too hard for the materials being cut.	Check bearings and arbor. If worn, replace with new parts before installing another blade.
Insufficient power caused by loose V-belts, or improper RPMs	Tighten belts taut or replace any worn belts.

BLADE ISSUE 9) UNDERCUTTING - steel core wears faster than the diamond segment

COULD BE CAUSED BY...	POTENTIAL REMEDY
Highly abrasive material grinding against the core during operation. Most highly abrasive materials contain larger volumes of sand.	The flow of swarf (abrasive cuttings) must be distributed over a wider area, away from the critical segment area with undercut retardant segments or other types of undercut protectors specially positioned around the steel center to change the pattern of constant abrasion. Although successful in most cases, undercut protectors do not provide 100% protection.

BLADE ISSUE 10) CRACKED CORE - small, sometimes hairline, cracks form on the core

COULD BE CAUSED BY...	POTENTIAL REMEDY
Blade is too hard for material being cut.	Use correct blade with softer bond.
If diamonds are highly exposed, there could be a lack of sufficient coolant to the blade.	If saw is equipped with a water pump, make sure it is functioning properly. Check water supply at blade.
Excessive cutting pressure, jamming or twisting the blade in the cut can cause the blade core to bend or flex. When subjected to extreme stress and metal fatigue, the blade's steel core will eventually crack.	The saw operator should use steady, even feed pressure, and be careful not the twist or jam the blade in the cut.
Overheating through inadequate water supply or improper use of dry cutting blades.	Use adequate water to cool wet-cutting diamond blades. Allow adequate airflow around dry-cutting diamond blades to prevent overheating. NEVER USE A BLADE WITH A CRACKED CORE!

BLADE ISSUE 11) UNEVEN SEGMENT WARE - segments are worn on one side, reducing side clearance

COULD BE CAUSED BY...	POTENTIAL REMEDY
It is usually caused by misalignment of the saw or a lack of sufficient water on both sides of the blade.	Check saw alignment. Clean water system, make certain that water is properly applied to the leading edge of the blade flanges. If machine is equipped with a water pump, check to see if it is supplying enough water.
Blade is worn out-of-round due to bad bearings, worn arbor or excessive dulling condition. See excessive wear.	Replace bearings or worn arbor as required.