

Diamond Blade Performance – Concrete Cutting

Factors Involving Concrete

When cutting concrete, several factors influence your choice of diamond blades. These include:

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

The guidelines in this section are for general reference only. Your best source for information on the characteristics of the concrete you have 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 |

Size of the Aggregate

The size of aggregate affects diamond blade performance. Large 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 and bring new, sharp diamond grit to the surface. Softer aggregate will not dull 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. Some commonly used aggregates measure this way on the Mohs' scale.

| Mohs' Scale |
|--|
| 1-Talc |
| 2-Gypsum |
| 3-Calcite |
| 4-Fluorite |
| 5-Apatite |
| 6-Feldspar |
| 7-Quartz(Si O ₂) |
| 8-Topaz |
| 9-Corundum (Al ₂ O ₃) |
| 10-Diamond |