Why choose Kingthai diamond tools

Time is money, and choosing the correct diamond tool for a job can save you a lot of time. Then you can always get qualified help if something does not work as you expect. Remember, price and quality tend to go together. A low-cost tool of mediocre quality is rarely a good investment if you are going to use the tool professionally.

The diamond tool should be adapted to the machine’s power, the application (type of job) and the materials you will cut. You can either opt for a universal tool that works well on several different
materials or an optimised tool designed for cutting a specific material.

Decide which of the tool’s properties is most important to you – cutting speed or wear resistance. High cutting speed helps you get the job done quickly, with less effort. High wear resistance means longer service life in more extensive jobs.

**How does a diamond tool work?**

A diamond tool consists of a support blade, a wire or drill tube, together with a cutting edge that has segments or beads containing diamonds. The segments or beads consist of a mixture of diamonds and a bond, usually a metal powder, which is sintered together under high pressure and temperature. The tool’s
performance is related to the quality of the diamonds and the concentration of diamonds in the segments. When used, the diamond tool forms an increasingly deeper groove in the material that is being cut. The diamonds in the surface of the segments wear down eventually, at the same time as the bond is worn away to expose new diamonds. So it is also very important that the hardness of the bond is suitable for the material to be cut.

Diamond tools do not really “cut” like a knife – they grind. During the cutting 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. 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.

Synthetic diamonds and secret recipes

The material in the segments is a mixture of diamonds and metallic bond. We need diamonds with differing sizes and properties to make our diamond tools. Kingthai generally uses industrial diamonds for best performance, top quality synthetic diamonds that have been carefully selected by our in-house expert team. The diamonds are mixed with a bond that consists of various powdered
The exact recipe of the diamond and metal powder mixture depends on the application that the tool will be used for. Kingthai uses hundreds of different recipes, which are closely guarded company secrets.

Segment designs

Segments and beads on diamond tools can look different, depending on the properties of the tool. Special machines are used to give segments the correct shape and dimension, where the mixture of diamond and metallic binder is pressed into the shape that the segment should have. The segment is then subjected to high temperature and pressure, and the powder mixture is sintered to form a solid, homogenous unit. After this, the segment or bead is ready to be installed on the blade, drill or wire. When the powder mixture is sintered, it is important that the diamonds are evenly distributed, so that the diamonds do not all end up on one edge of the segment.

High precision cores
A diamond tool rotates at high speed. Heavy vibration will occur if the tool is not perfectly balanced. The risk that vibration will cause equipment damage and operator injury is not acceptable. For this reason, Kingthai specifies the highest quality standards for tool cores. As a professional supplier, Kingthai ensures that the steel core is the best in terms of geometry and steel quality. Another problem could be the high noise levels, especially when cutting with large wall saw or floor saw blades. As an alternative to solid cores, Kingthai can offer blades with a so-called sandwich design, where the core blade consists of three layers. The two outer layers are made of steel and there is a thin foil between the steel plates, commonly made from copper, that reduces the resonance in the core, and thus cuts the noise. Compared with a conventional blade
core, the new design is often perceived to generate half as much noise.

**Assembly and final finish**

When a diamond tool is used, the segment and the joint between the segment and the core are subjected to heavy forces. If the joint cannot withstand the force, the segment can be thrown out at a speed of up to 100 m/s (225 mph). Understandably, it is extremely important that the joint between the segments and the core is of very high quality. The forces that the joint must withstand are governed by European Standard EN13236. Kingthai either uses
silver soldering or laser welding to assemble the segments on the core. Tools intended for sawing or drilling without water cooling are always laser-welded. Tools intended for use with water cooling are either silver-soldered or welded. We respect the environment and pay attention to our ecological footprint. Our factories are certified ISO 9001.

1. Before you get started

Decide which is most important: the initial price of the tool or the cost per cut. For smaller jobs or occasional use, a low priced tool may be preferable. For larger jobs or regular use, a higher priced tool 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 metre/foot) is usually much more important than the initial price.

2. Know the type and power of your equipment

Will you be using a 5-hp power cutter or a 70-hp flat saw? The answer will dramatically impact blade choice. The blade size, whether you can use a wet or dry blade and the rpms needed to
spin the blade all depend on the equipment.

3. **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. When you know the material our diamond tool recommendation charts help you find the most suitable tool.

Most Kingthai 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.

4. **Choose wet or dry cutting**

Choosing wet or dry may be a matter of user preference or job requirement. 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, depending on the job and the equipment.